

SERVIÇO PÚBLICO ESTADUAL PROPOSTA DETALHE		ANEXO II							
A fim de atender mencionada proposta fornecer em Estado do Rio de Janeiro, pelas preças abaixo detalhadas, obedecendo rigorosamente as condições estipuladas constantes do EDITAL nº. 023/2019		Licitação por Pregão Eletrônico nº 023/2019R1 A Realizar-se: 09/08/2019 às 14:00 horas Requisição nº: PRS 0045/2019 e 0044/2019 Processo nº: E-20/001.0017172019							
		<b>Telefonica Brasil S/A</b> <b>02.558.157/0001-62</b>							
ITEM	NÚMERO DE ESTIMATIVA (CÓDIGO)	DESCRIÇÃO	UNID.	QTD.	MARCA	PREÇO UNIDADE		PREÇO TOTAL	
						UNIT.	TOTAL	UNIT.	TOTAL
1.1	02-13600	<b>ITEM I</b> Locação de equipamento computador de tipo estação de trabalho, com 2 monitor Vlr Unitário R\$ 190,00 Vlr Total R\$ 1.900,00 Vlr Mensal R\$ 5.000,000 Vlr Global p/ 24 Meses R\$ 120.000,00	UN	2.600	Lenovo				
1.2	02-13600	<b>ITEM II</b> Locação de equipamento computador de tipo estação de trabalho, com 2 monitor Vlr Unitário R\$ 292,00 Vlr Total R\$ 2.920,00 Vlr Mensal R\$ 5.238,304 Vlr Global p/ 24 Meses R\$ 125.719,36	UN	2.400	Lenovo				
2.1	02-13600	<b>ITEM III</b> Locação de equipamento notebook de tipo ultraportátil VALOR UNITÁRIO R\$ 150,00 VALOR TOTAL R\$ 1.800,00 VALOR MENSAL R\$ 71.000,00 VALOR GLOBAL PARA 24 MESES R\$ 1.800.000,00	UN	500	Lenovo	R\$ 150,00	R\$ 1.800.000,00	R\$ 150,00	R\$ 1.800.000,00
3.1	02-13600	<b>ITEM IV</b> Fornecimento de licença Microsoft Office Standard 2019 VALOR UNITÁRIO R\$ 360,00 VALOR TOTAL R\$ 360.000,00	UN	5000	N/A				

1ª - A PROPOSTA DETALHE deverá:

- ser preenchida integralmente por processo mecânico ou eletrônico, sem emendas e rasuras;
- conter os preços em algarismos e por extenso, por unidade, já incluídas as despesas de frete, impostos federais ou estaduais e descontos especiais;
- ser datada e assinada pelo gerente ou seu procurador;
- 2ª - O proponente se obriga, mediante devolução da PROPOSTA - DETALHE, a cumprir as demais regras contidas;
- 3ª - As duas primeiras vias da PROPOSTA - DETALHE deverão ser devolvidas a esta ORÇÃO, até a hora e data mencionadas, em envelope fechado, com a indicação do seu número e data do encerramento;
- 4ª - A licitação mediante PROPOSTA - DETALHE poderá ser anulada a todo, ou em parte, de acordo com a legislação vigente.

Prazo de entrega: De acordo com o Termo de Referência

Validade da Proposta - Deixar preço válido por 30 (trinta) dias úteis

Lugar de entrega/prestação: conforme o Termo de Referência. Declarar-se inteiro e fielmente em respeito ao termo e legislação vigente.

Em: 10/08/2019

TELEFONICA BRASIL S/A

*Maria Clara PO Brehan*  
TELEFONICA BRASIL S/A

Maria Clara Poio D'Oliveira Bressa  
CPF: 032.054.408-05  
RG: 11.091.093 SSP/SP  
TELEFÔNICA

TELEFONICA BRASIL S/A  
CNPJ: 02.558.157/0001-62  
Inscrição Estadual 108.383.949.112  
Inscrição Municipal 2.871.449-0  
Av. Luiz Carlos Berrini, 1.376  
CEP 04571-000 - São Paulo - SP



**SERVIÇO PÚBLICO ESTADUAL  
PROPOSTA DETALHE**

**ANEXO II**

Licitação por Pregão Eletrônico nº 023/2019 A Realizar-se: 26/08/2019 às 15:00 horas Regulação nº. PES 0045/2019 e 0044/2019 Processo nº. E-20/001.001717/2019

A firma ao lado mencionada propõe fornecer ao Estado do Rio de Janeiro, pelos preços abaixo assinalados, obedecendo rigorosamente às condições estipuladas constante do EDITAL nº. 023/2019

**Telefonica Brasil S/A  
02.558.157/0001-62**

ESPECIFICAÇÃO	PREÇO COM ICMS (R\$)		PREÇO SEM ICMS (R\$)	
	UNIT.	TOTAL	UNIT.	TOTAL
<p>Obs.: O detalhamento completo encontra-se discriminado no Termo de Referência (Anexo I).</p> <p><b>DADOS BANCÁRIOS /LICITANTE:</b> Agência Corporate, Avenida Paulista, 2300 – 2º Andar.</p> <p>Banco do Brasil: 001 Agência: 3070-8      Conta Corrente: C/C: 12.698 – 5</p> <p>Ag. (Nome/número) Conta Corrente nº: <b>INFORMAÇÕES PARA FATURAMENTO:</b> DEFENSORIA PÚBLICA DO ESTADO DO RIO DE JANEIRO – DPGE/RJ CNPJ: 31.443.526/0001-70 INSC. ESTADUAL: ISENTO END: Av. Marechal Câmara, 314 – Centro/RJ.</p>				


DATA 10/09/2019

*Maria Clara P.O. Bressan*

FIRMA PROPOENTE – ASSINATURA DO RESPONSÁVEL

Maria Clara Poço D'Oliveira Bressan  
CPF: 092.854.408-08  
RG: 11.021.093 58/SP  
TELEFÔNICA

**TELEFONICA BRASIL S/A**  
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SERVIÇO PÚBLICO ESTADUAL PROPOSTA DETALHE		ANEXO II							
A fim de ser melhor servido propõe fornecer ao Estado do Rio de Janeiro, pelos preços abaixo discriminados obedecendo rigorosamente às condições estipuladas constantes do EDITAL nº. 020/2019		Licitação por Pregão Eletrônico nº 020/2019R1 A Realizar-se: 09/09/2019 às 14:00 horas Requisição nº. PEG 0046/2019 e 0044/2019 Processo nº. E-20/001.001717/2019							
		<b>Telefonica Brasil S/A</b> <b>02.558.157/0001-62</b>							
ITEM	QUANTIDADE (UNID. ESTADUAL)	ESPECIFICAÇÃO	UNID.	QTD.	MARCA	PREÇO COM IMPOSTOS		PREÇO SEM IMPOSTOS	
						UNIT.	TOTAL	UNIT.	TOTAL
1.1	01 - UNIDADE	0011 modelo de equipamento computador de tipo estação de trabalho, com 1 monitor Vr Unidade R\$ 181,14 Vr Total R\$ 181,14 Vr Monitor R\$ 5.008,768 Vr Global a/ 24 Meses R\$ 20.117,389	UN	2.600	Lenovo				
1.2	01 - UNIDADE	0012 modelo de equipamento computador de tipo estação de trabalho, com 2 monitores Vr Unidade R\$ 181,14 Vr Total R\$ 1.810,26 Vr Monitor R\$ 3.238,069 Vr Global a/ 24 Meses R\$ 30.216,687 Vr Global de taxa R\$ 28.094,346	UN	2.400	Lenovo				
2.1	01 - UNIDADE	0013 modelo de equipamento notebook de tela ultra portátil VALOR UNITÁRIO R\$ 150,00 VALOR TOTAL R\$ 1.800,00 VALOR MENOR R\$ 75,000,00 VALOR GLOBAL PARA 24 MESES R\$ 1.800,000,00	UN	500	Lenovo	R\$ 150,00	R\$ 1.800.000,00	R\$ 150,00	R\$ 1.800.000,00
3.1	01 - UNIDADE	0014 Terminais de linha Microsoft Office Standard 2013 VALOR UNITÁRIO R\$ 500,00 VALOR GLOBAL R\$ 500,000,00	UN	5000	N/A				
<p>1ª - A PROPOSTA DETALHE deverá:</p> <ul style="list-style-type: none"> <li>- ser preenchida integralmente por processo mecânico ou eletrônico, sem emendas e alterações;</li> <li>- conter os preços em algarismos e por extenso, por unidade, já incluídas as despesas de frete, impostos federais ou estaduais e descontos especiais;</li> <li>- ser datada e assinada pelo gerente ou seu procurador;</li> </ul> <p>2ª - O proponente se obrigará, mediante devolução da PROPOSTA - DETALHE, a cumprir os termos nela contidos.</p> <p>3ª - As duas primeiras vias da PROPOSTA - DETALHE deverão ser devolvidas a este ORGAO, até à hora e data marcadas, em envelope fechado, com a indicação do seu número e data do encerramento.</p> <p>4ª - A licitação mediante PROPOSTA - DETALHE poderá ser anulada no todo, ou em parte, de ofício ou a pedido, com a legislação vigente.</p>			<p>Prazo de entrega: De acordo com o Termo de Referência</p> <p>Validade da Proposta - Detalhe: preços válidos por 60 (sessenta) dias úteis.</p> <p>Local de entrega/prestação: conforme o Termo de Referência. Declaramos estar submetido ao presente termo e legislação vigente.</p> <p>Em: 10/09/2019.</p> <p style="text-align: right;">TELEFONICA BRASIL S/A</p>						
DATA 10/09/2019			 TELEFONICA BRASIL S/A						

Maria Clara Polo D'Oliveira Berra  
 CNPJ: 02.558.157/0001-62  
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# CERTIFICADO DE CONFORMIDADE

## CERTIFICATE OF CONFORMITY

Certificado No. / Certificate No. **UL-BR 18.0307**  
Data de Emissão / Date of issue **23 de maio de 2018 / May 23, 2018**  
Página / Page **1/14**

**Certificado de conformidade válido somente acompanhado das páginas de 1 até 14**  
*Certificate of conformity valid with pages from 1 to 14*

Fornecedor / Supplier (101692254)	<b>LENOVO TECNOLOGIA (BRASIL) LTDA</b> Estrada Municipal José Costa de Mesquita, 200 Módulos 5 e 10, Chacara Alvorada, Indaiatuba - SP CEP 13337-200, Brazil CNPJ - 07.275.520/0001-61
Produto Certificado / Certified Product	<b>Computador notebook / Notebook</b>
Família de Produto / Product's Family	ThinkPad
Modelo - Tipo / Model - Type	T480, model(s) 20L5XXXXX, 20L6XXXXX ("X" can be any alphanumeric character or blank)
Código de barras / Barcode	N/A
Descrição (Nome comercial) / Description (Brand Name)	LENOVO
Marca Comercial / Trademark	LENOVO
Quantidade Importada / Quantity Imported	N/A
Unidade de medida / Measurement Unit	N/A
Lote ou No. de Série / Lot or Serial Number	N/A
Número e Data da Licença de Importação / Number and Import License Date	N/A
Normas Aplicáveis / Applicable standards	IEC 60950-1:2005 + A1:2009 + A2:2013, CISPR 22: 2012, CISPR 32: 2012, CISPR 24: 2015, IEC 61000-3-2:2014, IEC 61000-3-3:2013, IEC 61000-4-2: 2008, IEC 61000-4-3: 2008 + A1: 2007 + A2: 2010, IEC 61000-4-4: 2012, IEC 61000-4-5: 2014, IEC 61000-4-6: 2013, IEC 61000-4-8: 2009, IEC 61000-4-11: 2017
Programa de Certificação ou Portaria / Certification Program or Decree	PORTARIA NO. 170/2012 / DECREE NO. 170/2012 PORTARIA NO. 407/2015 / DECREE NO. 407/2015 PORTARIA NO. 48/2017 / DECREE NO. 48/2017
Relatório de Avaliação e Ensaios / Assessment and Test Report #	BR2334, Vol. 1, Sec. 73
Concessão Para / Concession for	Ostentar o Selo de Identificação da Conformidade do Sistema Brasileiro de Avaliação da Conformidade (SBAC) sobre o(s) produto(s) relacionado(s) neste certificado. Bearing the Conformity Identification Seal of the Brazilian System of Evaluation of Conformity (SBAC) on the product covered by this certificate.
Revisão / Revision date	-
Validade / Expiry date	22 de maio de 2021 / May 22, 2021

  
Delza M. Ferreira  
Gerente de Operações  
Operations Manager

UL do Brasil Certificações, organismo acreditado pela Coordenação Geral de Acreditação do INMETRO - CGCRE, segundo o registro N° OCP-0029 confirma que o produto está em conformidade com a(s) Norma(s) e programas ou Portarias acima descritas.

UL do Brasil Certificações, Certification Body accredited by Coordenação Geral de Acreditação do INMETRO - CGCRE according to the register N° OCP-0029 confirms that the product is in compliance with the standards and certification Programs or Decrees above mentioned.



Organismo de Certificação /  
Certification Body

**UL do Brasil Certificações**

Av. Engenheiro Luís Carlos Berini, 105 - 24º Andar  
São Paulo - SP - Brasil - 04571-010  
T: 55.11.3049.8300 / W: brazil.ul.com

# CERTIFICADO DE CONFORMIDADE

## CERTIFICATE OF CONFORMITY

Certificado No. / Certificate No. **UL-BR 18.0307**  
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Página / Page **1/14**

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*Certificate of conformity valid with pages from 1 to 14*

Fornecedor / Supplier (100592254)	LENOVO TECNOLOGIA (BRASIL) LTDA Estrada Municipal José Costa de Mesquita, 200 Módulos 5 a 10, Chacara Alvorada, Indaiatuba - SP CEP 13337-200, Brazil CNPJ - 07.275.920/0001-61
Produto Certificado / Certified Product	Computador notebook / Notebook
Família de Produto / Product's Family	ThinkPad
Modelo - Tipo / Model - Type	T480, model(s) 29L5XXXXX, 20L5XXXXX ("X" can be any alphanumeric character or blank)
Código de barras / Barcode	N/A
Descrição (Nome comercial) / Description (Brand Name)	LENOVO
Marca Comercial / Trademark	LENOVO
Quantidade importada / Quantity imported	N/A
Unidade de medida / Measurement Unit	N/A
Lote ou No. de Série / Lot or Serial Number	N/A
Número e Data da Licença de Importação / Number and Import License Date	N/A
Normas Aplicáveis / Applicable standards	IEC 60950-1:2005 + A1:2009 + A2:2010; CISPR 22: 2012; CISPR 32: 2012; CISPR 24: 2015; IEC 61000-3-2:2014; IEC 61000-3-3:2013; IEC 61000-4-2:2008; IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010; IEC 61000-4-4: 2012; IEC 61000-4-5: 2014; IEC 61000-4-6: 2013; IEC 61000-4-8: 2009; IEC 61000-4-11:2017.
Programa de Certificação ou Portaria / Certification Program or Decree	PORTARIA NO. 170/2012 / DECREE NO. 170/2012 PORTARIA NO. 407/2015 / DECREE NO. 407/2015 PORTARIA NO. 48/2017 / DECREE NO. 48/2017
Relatório de Avaliação e Ensaio / Assessment and Test Report #	BR2304, Vol. 1, Sec. 73
Concessão Para / Concession for	Ostentar o Selo de Identificação de Conformidade do Sistema Brasileiro de Avaliação de Conformidade (SBAC) sobre o(s) produto(s) relacionado(s) neste certificado. <i>bearing the Conformity Identification Seal of the Brazilian System of Evaluation of Conformity (SBAC) on the product covered by this certificate.</i>
Revisão / Revision date	-
Validade / Expiry date	22 de maio de 2021 / May 22, 2021

  
Delzita M. Ferreira Jr.  
Gerente de Operações  
Operations Manager

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Organismo de Certificação /  
Certification Body

**UL do Brasil Certificações**  
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Item 3 – Equipamento Notebook do tipo ultra portátil			
Componente	Especificação	Documento Origem	Localização
Geral	Não serão admitidas configurações, ajustes ou alterações que impliquem no funcionamento fora as condições mínimas recomendadas pelo fabricante do equipamento, tais como: alterações de frequência de clock (overclock), volatilidade de dados de memória, uso de drivers não homologados, etc.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
Placa Mãe	Suportar ACPI (Advanced Configuration and Power Interface), com controle automático de rotação de ventilador da CPU.	T480 User Guide	Página 66, 2 parágrafo
	Deverá possuir, integrado à placa-mãe do computador (on-board), sem adaptações, sub-sistema de segurança TPM (Trusted Platform Module) compatível com a norma TPM Specification Version 2.0 ou superior especificado pelo TCG (Trusted Computing Group).	T480 User Guide	Página 70, 2 parágrafo
	Suportar Boot por pen drive ou drive conectado ao USB.	T480 User Guide	Página 64, 4 parágrafo
	Suportar autenticação IEEE 802.1x nas interfaces de rede integradas pelo fabricante no equipamento, mesmo que o sistema operacional não tenha sido instalado.	T480 User Guide	Página 125, sub item Wireless-related information
	Deverá ser do mesmo fabricante do processador, ou fabricado sob suas especificações, não sendo aceito o emprego de placas-mãe de livre especificação no mercado.	T480 User Guide	Página 26, último parágrafo
	A placa-mãe fornecida deverá ser totalmente compatível com o processador ofertado.	T480 User Guide	Página 20, sub item Microprocessor
BIOS	Deverá possibilitar expansão de memória DDR4, com frequência de no mínimo 2 400MHz, até no máximo 16 GB (dezesseis gigabytes), com substituição e ausência de perdas de memória, permitidas, acima, o acesso solicitado.	Especificações técnicas T480 20165CW00	Página 1, linha 11 e 12
	Reservar interface de disco rígido através SATA II de 6GB/s, NVMe ou M.2 (2280).	T480 User Guide	Página 97, sub item Self-service DRUs
	Atualização automática da BIOS, através de software próprio do fabricante (publicações no site) ou homologado por ele.	T480 User Guide	Página 70, sub item UEFI BIOS Update Guide e página 95, sub item Using automatic update option
	Compatível com modo Sleep & Play.	Atualização de BIOS.pdf	Página 1
	Suportar SMBS (System Management BIOS) na versão 2.3 ou superior.	T480 User Guide	Página 74, sub item Desktop Management Interface
	BIOS português ou inglês em conformidade com a especificação UEFI 2.1 ( <a href="http://www.uefi.org">http://www.uefi.org</a> ), e capturável pela aplicação de inventário. O fabricante deverá possuir compatibilidade com o padrão UEFI com provedores através do site <a href="http://www.uefi.org/members">http://www.uefi.org/members</a> , na categoria membros.	Uefi Members Page.pdf	Página 1, no endereço <a href="https://uefi.org/members">https://uefi.org/members</a>
	Suporte à tecnologia de previsão e contingenciamento de falhas de disco rígido S.M.A.R.T habilitada.		
	Possuir função de registro de número de série da placa-mãe com leitura remota.	T480 User Guide	Página 68, sub item System-uefi serial number e System board serial number
	Deve ser desativada pelo mesmo fabricante do equipamento ou via Copyright. O fabricante do computador deverá possuir livre direito de edição sobre a BIOS, garantindo assim adaptabilidade do conjunto adquirido. Caso o mesmo não tenha sido em regime de copyright, o fabricante da BIOS deverá manter o livre direito de edição por parte do fabricante do equipamento.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
	Deve possuir sistema integrado de diagnóstico que permita verificar a saúde do sistema, bem como diagnósticos na BIOS em modo gráfico nos modos simples ou avançado, capaz de verificar os seguintes itens: Slots PCI/PCI Express; Saúde de Vídeo; Unidades de Armazenamento; Boot do sistema operacional; Funcionalidade de portas USB; Processador e Memória RAM.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
Processador	Possuir ferramentas que possibilitem realizar a formatação definitiva dos dispositivos de armazenamento conectados ao equipamento.	T480 User Guide	Página 69, sub item Formatting your computer
	Deve atingir índice de, no mínimo, 8.000 pontos (admitida variação máxima de 1%) para o desempenho, tendo como referência a base de dados Passmark CPU Mark disponível no site <a href="http://www.passmark.com/pt-br">http://www.passmark.com/pt-br</a> .	PassMark CPU Benchmarks Page - 5 833014E1 70Hz.pdf	Página 1
	Deve possuir arquitetura 64, 64 (seisenta e quatro) bits, do tipo Mobile, com extensões de virtualização.	Processor Core i5-8350U@1.1GHz - ARX Intel Page.pdf	Página 1, sub item Segmento vertical, página 3 sub item conjunto de instruções
	Deve possuir TDP (Thermal Design Power – quantidade de potência que o sistema de resfriamento do processador deve ser capaz de dissipar) de, no máximo, 20W.	Processor Core i5-8350U@1.1GHz - ARX Intel Page.pdf	Página 1, sub item TDP (13W)
	Controlador de vídeo integrada ao processador com suporte às tecnologias Direct X 12.0 e OpenGL 4.0 ou superior.	Processor Core i5-8350U@1.1GHz - ARX Intel Page.pdf	Página 2, sub item Suporte para DirectX 12 e sub item Suporte para OpenGL 4.4
	Possuir instruções AES (Advanced Encryption Standard) integradas ao processador.	Processor Core i5-8350U@1.1GHz - ARX Intel Page.pdf	Página 3, sub item Novas Instruções Intel AES
	Possuir instruções SSE (Streaming SIMD Extensions), versão SSE5, e AVX (Intel Advanced Vector Extensions).	Processor Core i5-8350U@1.1GHz - ARX Intel Page.pdf	Página 3, sub item Detalhes do conjunto de instruções - Intel SSE4.1, SSE4.2 e Intel AVX2
	De última geração disponível pelo fabricante do processador no mercado nacional, com processo de fabricação vigente, não podendo estar em descontinuidade.	Tabela de Preço - Página 1 (versão -10-09-2018)	Impressão da página no site fabricante com modelo em linha e com preços de lista para entrega em SP
	Sistema de dissipação de calor dimensionado para perfeita refrigeração do processador.	T480 User Guide	Página 66, 2 parágrafo; página 67, parágrafo 3.
	Memória RAM	8 (oito) Gigabytes de memória RAM – DDR4 com no mínimo 2400MHz, ou superior, configurados no modo dual channel ou superior.	Especificações técnicas T480 20165CW00
Possibilidade de expansão até 16 GB (dezesseis gigabytes).		Especificações técnicas T480 20165CW00	Página 1, linha 12
Unidade de armazenamento	Tipo SSD (Solid-state drive) interno com capacidade mínima de 128 GB/s e tecnologia MLC (Multi Memory Cell) ou superior.	Especificações técnicas T480 20165CW00	Página 1, linha 11
	Conector SATA II ou NVMe ou M.2, de 6 GB/s, ou superior.	Especificações técnicas T480 20165CW00	Página 1, linha 11
Interfaces de comunicação	Possuir MTBF (Mean Time Between Failures) de no mínimo 1.000.000 de horas, capacidade de leitura dinâmica sequencial de no mínimo 510 MB/s, capacidade de escrita sequencial de no mínimo 240 MB/s.	T480 User Guide	Frota de de item que varia com as linhas de fabricação. Seguem as capacidades mínimas do mercado. Atender ao fabricante no e-mail
	Dispositivo de rede sem fio nos padrões 802.11a, 802.11ac, 802.11g e 802.11n ou, alternativamente, dispositivo de rede sem fio nos padrões 802.11b, 802.11e, 802.11g e 802.11n.	T480 User Guide	Página 127, sub item Wireless interoperability
	Controlador sem fio com suporte à 2,4 GHz e 5 GHz de banda.	T480 User Guide	Página 129, sub item Wireless interoperability. Equipamento suporta 802.11n (2.4GHz/5GHz), 802g (2.4GHz) e 802n (5GHz)
	Antena wi-fi de dupla-banda (Dual-band) interna.	Especificações técnicas T480 20165CW00	Página 1, linha 21
	01 (uma) controladora de rede, integrada à placa mãe com velocidade de 10/100/1000 Mb/s, padrões Ethernet, Fast-Ethernet e Gigabit Ethernet, autossistema, full-duplex, plug-and-play, configurável totalmente por software, com conector patchlo RJ-45 e função wake-on-lan em funcionamento e suporte a múltiplas VLANs (802.1q e 802.1x).	Especificações técnicas T480 20165CW00	Página 3, linha 18
01 (uma) interface Bluetooth Bluetooth e 4.0 ou superior, integrada ao equipamento, sem o uso de adaptadores.	Especificações técnicas T480 20165CW00	Página 1, linha 21	

Interfaces	03 (três) portas USB, sendo ao menos 01 (uma) com interface no padrão USB 3.1.	Especificações técnicas T480 2DU5SCW100	Página 1, linha 30
	01 (um) conector padrão mini D-SUB, ou D-SUB, 15 pinos fêmea para conexão de monitor externo sendo aceita uso de adaptadores, desde segundo caso o adaptador deverá ser fornecido junto com o equipamento.	T480 User Guide	Será entregue adaptador
	01 (uma) interface HDMI sendo aceita substituição externa no caso de porta DisplayPort ou mini DisplayPort. Neste segundo caso o adaptador deverá ser fornecido junto com o equipamento.	T480 User Guide	Página 4, sub item Right side view
	Não serão aceitas interfaces adaptadas em dispositivos USB, cartões externos tipo PCMCIA ou Express Card.	De acordo	De acordo
Áudio	Controladores de áudio interno 24 bits com suporte a "High Definition Audio" ou Arquitetura de Áudio Unificada.	Especificações técnicas T480 2DU5SCW100 // T480 User Guide	Página 1, linha 17 // página 30, sub item Using audio features
	01 (um) conector para fone de ouvido ou disponível em interface combinada e/ou 01 (um) conector para microfone ou disponível em interface combinada, na função somdo.	T480 User Guide	Página 30, sub item Using audio features
	02 (dois) alto-falantes embutidos, com potência total mínima de 2 watt cada (sendo aceita variação de 25% na potência) e controle de som (aumentar, diminuir e mudar) integrado - gerenciado ou através de combinação de teclas (Fn +).	T480 User Guide	Página 19, sub item 2 e 3 Fn key and function keys
	01 (um) microfone digital integrado.	T480 User Guide	Página 1, sub item Front view e página 30, sub item Using audio features
Gabinete, pesos e mediadas	A Espessura (altura) máxima de 2,20 cm (com flexibilidade de 3% para mais) em toda sua extensão e com o equipamento fechado.	T480 User Guide	Página 12, sub item Computer specifications
	Peso máximo de 3,8 Kg (com flexibilidade de 5% para mais) contando com a bateria e disco SSD. Mouse e toco de transporte não serão pesados em conjunto com o equipamento.	Lenovo T480 Datasheet_EN_v1.pdf	Página 1, sub item Weight
	Convergir ser reforçado com os seguintes dispositivos: Turbo ou Magnético ou Titânio ou alumínio ou refilço de fibra de vidro reforçada com plástico ou ABS de alta resistência ou sendo composto similar destinado ao uso corporativo. Deverá ser comprovado através de manual do equipamento ou declaração do fabricante do equipamento ou por laudo técnico emitido pelo INMETRO, IPT ou outro órgão ou instituição reconhecida em capacidade(s) para avaliação de composições materiais.	Especificações técnicas T480 2DU5SCW100	Página 1, sub item Gabinete
	Cor preta, prata, prata ou combinação dessas.	T480 User Guide	Página 1, sub item Front View
	Botão lig/deslig deverá ter a possibilidade de ser desligado por software mediante pressionar a botão, o que deve possuir dispositivo de proteção para prevenir o desligamento acidental.	T480 User Guide	Página 1, sub item Front view
	Possuir luz de indicação do equipamento ligado (power on) acoplado ao hardware.	T480 User Guide	Página 1, sub item Front view
Alimentação	bateria universal para casos de segurança.	T480 User Guide	Página 4, sub item Right side view
	Considerando o acesso aos dispositivos de armazenamento, medida pelo software battery. Exter mais recente ou pelo software Battery Monitor 2021 ou mais recente, a bateria deve garantir funcionamento do equipamento por pelo menos 150 minutos em condições normais de uso, com a tela em brilho médio. Abaixo de tempo estipulado, a bateria será considerada deficiente.	Lenovo T480 Datasheet_EN_v1.pdf	Página 1, sub item Battery
	Carregador 6volt compatível com o equipamento ofertado.	T480 User Guide	Página 12, sub item Power source
	Porta de alimentação, compatível com a bateria ofertada com as especificações de tempo de autonomia indicadas no item anterior.	T480 User Guide	Página 12, sub item Power source
Tela	Adaptador AC universal para o equipamento - entrada de 100/220 VAC - 50/60 Hz, com comutação automática. Não será aceito nenhum transformador externo.	T480 User Guide	Página 12, sub item Power source
	Deverão ser fornecidos cabos de energia com plugues atendendo o novo padrão sação brasileiro para tomadas e plugues elétricos (norma ABNT 14136). Neste caso, o contratado deverá entregar os respectivos adaptadores, considerando atrelado ao fornecido no equipamento em formato de modelo antigo (2P+T).	T480 User Guide	Página 12, sub item Power source
	Tecnologia LCD ou LED, ou OLED de, no mínimo, 13,3" (medida diagonal real polegadas), no máximo, 14" (quartzo integrado) na diagonal (admitida variação máxima de 4 5%).	T480 User Guide	Página 11, sub item Display
	Resolução Full HD (1920x1080 pixels) ou superior, com no mínimo 16 milhões de cores.	T480 User Guide	Página 11, sub item Display
	Possuir controle de brilho.	T480 User Guide	Página 11, sub item Display
Webcam	Capacidade de visualização simultânea das imagens na tela e em um monitor externo, com tratamento anti-reflexivo.	T480 User Guide	Página 11, sub item Display
	Câmera integrada de alta resolução (720p HD) ou superior.	Lenovo T480 Datasheet_EN_v1.pdf	Página 1, sub item Camera
Teclado	Correspondente com o padrão ABNT 8.	Especificações técnicas T480 2DU5SCW100	Página 1, sub item Teclado
	O funcionamento deverá ser perfeito quando o sistema operacional estiver configurado para o teclado Brasileiro padrão ABNT 8.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
	Presença de, no mínimo, doze teclas de função (F1-F12) situadas na porção superior do teclado, com acionamento feito de forma direta, ou seja, sem ser por meio de combinação de teclas.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
	Impressão das teclas de tipo permanente, não podendo apresentar desgaste por atrito ou uso prolongado.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
	Possuir trava e/ou proteção física do projeto do equipamento que possibilite passagem do líquido para o interior do equipamento nos casos de derramamento acidental.	De acordo	Entendemos que este item será confirmado durante as provas de homologação
Mouse Óptico	Dispositivo apontador integrado ao gabinete, tipo "touch pad", com a funcionalidade de botão esquerdo e direito.	T480 User Guide	Página 1, sub item Front View
	Dois botões e "scroll wheel", formato ergonômico e ambidestro (bimétrico).	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
	Tecnologia óptica (sem estereó).	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
	Resolução de 1000 dpi ou superior.	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
	Deverá ser da mesma cor predominante do gabinete do equipamento.	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
	Poderá ser de outra marca, desde que homologada pelo fabricante do equipamento.	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
	Plug-and-play compatível com Windows 10 Professional.	Lenovo Essential USB Mouse	Página 1, sub item Especific. Técnicas
Sistema operacional	Deverá vir acompanhado de mouse pad com suporte de borracha ou gel para o dedo.	De acordo	
	O equipamento deverá ser entregue com a licença do sistema operacional Microsoft Windows 10 Professional 64 bits OEM no idioma Português do Brasil. A contratante poderá solicitar a Microsoft verificação da autenticação do software.	De acordo	
Suíte Microsoft Office	A instalação do sistema operacional deverá ser feita a partir do especificado no item 3.3 - Instalação e gestão de imagens.	De acordo	
Adaptação às políticas e normas ambientais	Após aquisição e disponibilização do software pelo CONTRATANTE, a instalação do suite deverá ser feita a partir do especificado no item 3.3 - Instalação e gestão de imagens.	De acordo	
	Possuir certificação EPEAT (EPEAT Product Environmental Assessment Tool) ou, alternativamente, possuir certificação emitida por organizações acreditadas pelo INMETRO, que atenda aos requisitos de Avaliação de Conformidade da Portaria INMETRO 170/2012 e a liberações posteriores. Estas certificações devem garantir aos bens de TI um padrão de qualidade, segurança e proteção ambiental.	Certificado ambiental 170-T480.pdf	Página 1, é a impressão da página <a href="http://www.lenovo.com.br/product/certificados/tae.asp">http://www.lenovo.com.br/product/certificados/tae.asp</a>

em ergonomia e ergonomia	O equipamento deve seguir a diretiva de RoHS (Restrição of Hazardous Substances) em seu processo de fabricação. A existência visa a restrição de uso de substâncias nocivas no processo de fabricação dos equipamentos.	RHOS Eco Declaration - ThinkPad T480	Páginas 1 a 9
Compatibilidade	Para o modelo de microcomputador ofertado, deve ser comprovada a compatibilidade com o sistema operacional Windows 10 Professional ou superior, mediante declaração do fabricante do equipamento. Esta compatibilidade deve ser comprovada através de presença do equipamento na lista Windows Catalog, mantida pela Microsoft, devidamente atualizado, na página dos equipamentos.	Hardware Certification Report - Windows 10 T480	Página 2
	Os equipamentos ofertados (Marca e Modelo) não deverão estar em processo de descontinuação na data da abertura do certame. A licitante deverá apresentar declaração do fabricante, link do site oficial do fabricante indicando ainda a comercialização do modelo do equipamento, e/ou qualquer outra documentação oficial que comprove que o equipamento ofertado se encontra em linha de produção.	Tabela de Preços - Página Lançado - 12/09/2015	Impressão da página do site fabricante com modelo em linha e com preços de lista para entrega em SP.
	Número de série único para cada acionamento, afixado em local visível na parte externa do gabinete (ou no compartimento da bateria) e na embalagem que o contém, conforme previsto no item "3.4 - Identificação dos equipamentos fornecidos".	De acordo	Entendemos que este item será confirmado durante as provas de homologação.
	Deverá ser entregue todos os cabos, drivers e manuais necessários à sua instalação bem como a de seus componentes.	De acordo	Entendemos que este item será confirmado durante as provas de homologação.
	Não poderá ser do tipo NETBOOK.	De acordo	N/A
Todos os equipamentos e seus entregues deverão ser idênticos, do tipo, todos os componentes externos e internos com os mesmos modelos e marca dos utilizados nos equipamentos enviados para homologação, conforme previsto no item "3 - Descrição da solução a ser contratada".	De acordo	Entendemos que este item será confirmado durante as provas de homologação.	
Acessórios	Deverá o equipamento vir acompanhado de maleta ou mochila para transporte e proteção, em couro, poliéster, polietileno ou nylon, na cor preta (ou igual à do equipamento), com acabamento interno / externo acolchoado, reforçado para proteção extra, com alça removível e bolsos internos (para documentos e objetos) e externos (para acomodar carregador e mouse), garantia e efetiva resistência ao equipamento.	De acordo	Entendemos que este item será confirmado durante as provas de homologação.
	Deverá ser entregue todos cabos, e conectores necessários ao funcionamento do equipamento.	De acordo	Entendemos que este item será confirmado durante as provas de homologação.
Garantia	Deverá possuir garantia e cobertura de assistência técnica onsite durante toda a vigência contratual, incluindo a substituição de peças ou componentes em caso de defeito, conforme descrito no item "3.7 - Garantia, Suporte e Assistência Técnica".	Especificações técnicas 1480.00.60.0000	Página 1, sub item Garantia



# L THINKPAD T480

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Acessórios

Ver Modelos

PERSONALIZÁVEL

ThinkPad T480

Preço Web (SP):  
R\$ 6.980,00

FRETE GRÁTIS + IZT S/ JUROS  
VALOR DAS PARCELAS

✕ PERSONALIZAR

Modelos

PERSONALIZÁVEL

ThinkPad T480

Preço Web (SP):  
R\$ 7.238,00

FRETE GRÁTIS + IZT S/ JUROS  
VALOR DAS PARCELAS

✕ PERSONALIZAR

Modelos

PERSONALIZÁVEL

ThinkPad T480

Preço Web (SP):  
R\$ 8.082,00

FRETE GRÁTIS + IZT S/ JUROS  
VALOR DAS PARCELAS

✕ PERSONALIZAR

Modelos

ThinkPad T480

Cod. Produto: 20U65CWG00

Preço Web (SP):  
R\$ 8.369,00

FRETE GRÁTIS + IZT S/ JUROS  
VALOR DAS PARCELAS

🛒 ADICIONAR AO CARRINHO

Modelos

MOSTRAR AS DIFERENÇAS ENTRE OS PRODUTOS ▶

**Processador**

Intel® Core™ i5-8350U (1.7GHz;  
6MB Cache)

**Sistema Operacional**

Windows 10 Home SL 64  
(Português BR)

Lenovo recomenda o Windows 10  
Pro for Business

**Tela**

14" FHD Antirreflexo (1920x1080)

**Memória**

8GB (1x8GB) 2400MHz DDR4

**Processador**

Intel® Core™ i5-8350U (1.7GHz;  
6MB Cache)

**Sistema Operacional**

Windows 10 Home SL 64  
(Português BR)

Lenovo recomenda o Windows 10  
Pro for Business

**Tela**

14" HD Antirreflexo (1366x768)

**Memória**

16GB (2x8GB) 2400MHz DDR4  
1M

**Processador**

Intel® Core™ i5-8350U (1.7GHz;  
6MB Cache)

**Sistema Operacional**

Windows 10 Pro 64 (Português BR)

**Tela**

14" FHD Antirreflexo (1920x1080)

**Memória**

16GB (2x8GB) 2400MHz DDR4  
SO DIMM

**Gráficos**

Placa gráfica integrada

**Processador**

Intel® Core™ i7-8650U (1.9GHz;  
8MB Cache)

**Sistema Operacional**

Windows 10 Pro 64

**Tela**

14" HD Antirreflexo (1366x768)

**Memória**

8GB (1x8GB) 2400MHz DDR4

**Armazenamento**

1TB (5400rpm)

Unidade Ótica

CHAT

Área de Trabalho

22:47  
12/09/2019

<https://www.lenovo.com/br/pt/laptops/thinkpad/serie-t/ThinkPad-T480/p/22TP2TT4800>

**Lenovo****Especificações técnicas T480 20L6SCWJ00**

<b>PN</b>	<b>20L6SCWJ00</b>
<b>Descrição</b>	<b>T480 i5-8350U 8GB 256GB W10 Pro</b>
<b>Estado</b>	<b>NOVO</b>
<b>Tela</b>	14" LED HD Antirreflexo
<b>Processador</b>	Intel Core i5-8350U
<b>Chipset</b>	Intel SoC (System on Chip) platform
<b>Vpro</b>	Sim
<b>Placa Gráfica Integrada</b>	Intel HD Graphics Integrada
<b>Placa de vídeo Dedicada</b>	Não
<b>Memória</b>	8GB (1x8GB)
<b>Tipo</b>	2400MHz DDR4
<b>Memória máxima suportada</b>	32GB max (2 slots DDR4 SO-DIMM)
<b>Unidade de Disco (capacidade)</b>	256GB SSD M.2 PCIe-NVMe OPAL2
<b>Tipo de Disco</b>	SSD
<b>Drive Ótico</b>	Não
<b>Drive Ótico (tipo)</b>	Não
<b>Audio</b>	Doby Audio Premium
<b>Rede (Ethernet)</b>	Gigabit
<b>Slot WWAN</b>	Sim
<b>WWAN</b>	Não - chip 4G não incluso
<b>Rede (Wireless)</b>	Intel 8265 AC Dual Band
<b>Bluetooth</b>	Bluetooth 4.1
<b>Camera</b>	HD (720p) com ThinkShutter e microfone
<b>Biometria</b>	Fingerprint Reader
<b>Chip de Segurança</b>	Sim
<b>Dispositivo Apontador</b>	UltraNav (TrackPoint+TouchPad)
<b>Bateria (tipo)</b>	6 células [3 células 24Wh (interna) + 3 células 24 Wh (externa)]
<b>Bateria (duração aprox.)</b>	até 14,4 hrs*
<b>Teclado (layout)</b>	Português (BR)
<b>Porta(s) USB</b>	2x USB 3.1 (1 energizada) + 1x Type C
<b>Porta Thunderbolt</b>	1 x Thunderbolt™ 3 (USB Type-C)
<b>Saída de Vídeo</b>	te através de adaptador USB-Type C para VGA ou USB-Type C para DisplayPort - não incluso)
<b>Saída HDMI</b>	Sim
<b>Express Card Slot</b>	Não
<b>Media Card Slot</b>	4 em 1
<b>Smart Card Slot</b>	Não
<b>Sistema Operacional</b>	Windows 10 Professional 64 bits
<b>Garantia</b>	3 anos on-site
<b>Código EAN/UPC</b>	193266761735
<b>Gabinete</b>	PPS (tampa) / Fibra de vidro reforçada com plástico (base)
<b>Peso (Kg)</b>	1,55
<b>Dimensões (L x P x A)</b>	336,6mm x 232,5mm x 19,95mm



## Processador Intel® Core™ i5-8350U

cache de 6 M, até 3,60 GHz

[Adicionar para comparação](#)

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- Essenciais**
- Desempenho
- Informações complementares
- Especificações de memória
- Gráficos de processador
- Opções de expansão
- Especificações de encaixe
- Tecnologias avançadas
- Segurança e confiabilidade
- Fóruns e conformidade
- Downloads e software

### Essenciais Especificações de es

Coletor de produtos	8ª geração de processadores Intel® Core™ i5
Ordem	Produtos com denominação anterior Kaby Lake®
Segmento vertical	Notiê
Número do processador	i5-8350U
Status	Lançado
Data de introdução	Q3'17
Litografia	14 nm
Preço recomendado para o cliente	\$297,00

### Desempenho

Número de núcleos	4
Nº de threads	8
Frequência base em processador	1,70 GHz
Frequência turbo max	3,60 GHz
Cache	6 MB SmartCache
Velocidade do barramento	4 GT/s QPI
TDP	15 W

## Especificações

### Essenciais

#### Desempenho

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Frequência de TDP Configurável - alto	1,90 GHz
TDP Configurável - alto	25 W
Frequência de TDP Configurável - baixo	800 MHz
TDP Configurável - baixo	10 W

### Informações complementares

Opções integradas disponíveis	Não
Ficha técnica	Ver agora

### Especificações de memória

Tamanho máximo de memória (de acordo com o tipo de memória)	32 GB
Tipos de memória	DDR4-2400, LPDDR3-2133
NP máximo de canais de memória	2
Largura de banda máxima de memória	37,5 GB/s
Compatibilidade com memória ECC	Não

### Gráficos de processador

Gráficos do processador	Gráficos UHD Intel® 620
Frequência de base gráfica	300 MHz
Máxima frequência dinâmica da placa gráfica	1,10 GHz
Quantidade máxima de memória gráfica de vídeo	32 GB
Saída gráfica	vDND8yHfMU/VI

Suporte para 4K	Yes, at 60Hz
Resolução máxima (HDMI 1.4)	4096x2304@24Hz
Resolução máxima (DP)	4096x2304@60Hz
Resolução máxima (eDP - tela plana integrada)	4096x2304@60Hz
Suporte para DirectX	12
Suporte para OpenCL	4.4
Intel® Quick Sync Video	Sim
Tecnologia de alta definição Intel® Clear Video	Sim
Intel® Clear Video Technology	Sim
NP de telas suportadas	3
ID do dispositivo	0x5917

### Opções de expansão

Revisão de PCI Express	3.0
Configurações PCI Express	1x, 2x, 1x2+2x1 and 4x1
NP máximo de linhas PCI Express	32

### Especificações de encapsulamento

Sockets suportados	FC-BGA1356
Configuração máxima da CPU	1
T <sub>case</sub> máx	100°C
Tamanho do pacote	42mm x 24mm

## Especificações

### Essenciais

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Opções de Halógeno Baixo Disponível

Ne

## Tecnologias avançadas

Memória Intel® Optane™ suportada<sup>1</sup> ( ? )

Sim

Tecnologia Intel® Speed Shift ( ? )

Sim

Tecnologia Intel® Turbo Boost<sup>1</sup> ( ? )

20

Compatibilidade da plataforma Intel® vPro™<sup>2</sup> ( ? )

Sim

Tecnologia Hyper-Threading Intel®<sup>1</sup> ( ? )

Sim

Tecnologia de virtualização Intel® (VT-x)<sup>1</sup> ( ? )

Sim

Tecnologia de virtualização Intel® para E/S direcionada (VT-d)<sup>1</sup> ( ? )

Sim

Intel® vPro™ com Tabelas de página estendida (EPT)<sup>1</sup> ( ? )

Sim

Intel® TSX-NI ( ? )

Sim

Intel® 64<sup>1</sup> ( ? )

Sim

Conjunto de instruções ( ? )

64-bit

Extensões do conjunto de instruções ( ? )

Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2

Tecnologia Intel® My WiFi ( ? )

Sim

Estados ociosos ( ? )

Sim

Tecnologia avançada Intel® SpeedStep® ( ? )

Sim

Tecnologias de monitoramento térmico ( ? )

Sim

Acesso de Memória flexível Intel® ( ? )

Sim

Tecnologia de proteção de identidade Intel® ( ? )

Sim

Programa Intel® da Plataforma de Imagem Envel (SPP) ( ? )

Sim

Tecnologia Intel® de resposta inteligente ( ? )

Sim

## Segurança e confiabilidade

Novas instruções Intel® AES ( ? )

Sim

Chave Segura ( ? )

Sim

Intel® Software Guard Extensions (Intel® SGX) ( ? )

Yes with Intel® ME

Intel® OS Guard

Sim

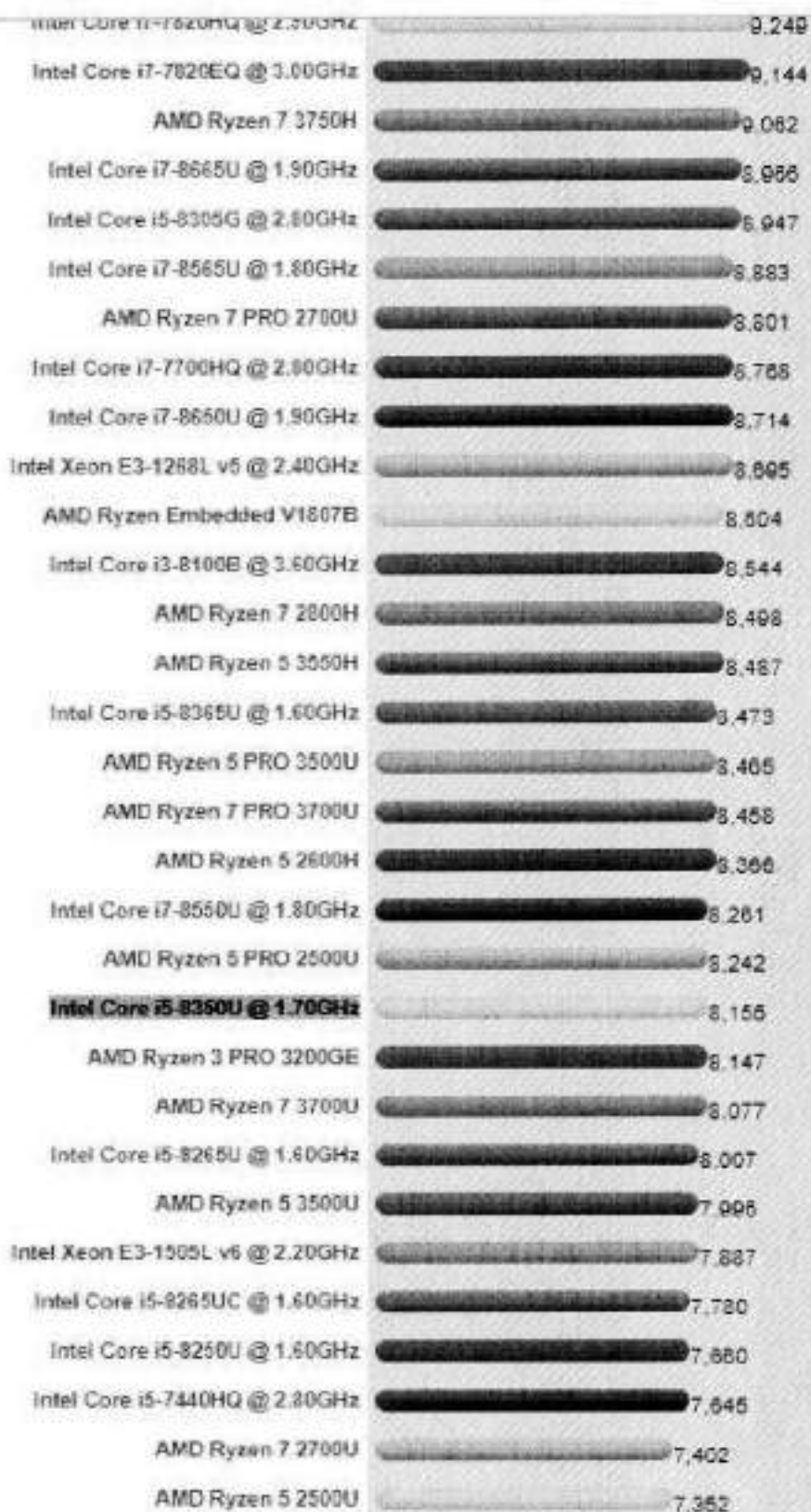
Intel® Trusted Execution Technology<sup>1</sup> ( ? )

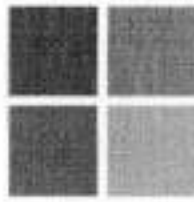
Sim

Bit de desativação de execução<sup>1</sup> ( ? )

Sim

t/laptop.html

[WebCalldesk](#)
[e-Licitação\\_INT](#)
[SIG-SEUM](#)
[Integra](#)
[Framework\\_INT](#)




# Microsoft

Hardware certification report **Approved**

Private product ID: 13853552144841815  
Shared product ID: 1152921504607403243  
Submission ID: 1152921504627279402  
Submission date: 1/8/2018  
Completion date: 1/8/2018  
Company: **Lenovo**  
Product name: **ThinkPad T480**  
Category: **System**  
Product type: **Laptop with Touch**  
Qualification level: **Certified for Microsoft Windows 10 Client family version 1709, x64**  
Marketing name: **ThinkPad T480 20L5**  
**ThinkPad T480 20L6**

Microsoft  
Certified



## Lenovo Essential USB Mouse

Cod. produto: 4Y50R20863

### Visão Geral

O Lenovo Essential USB Mouse é mais do que o seu mouse básico. Ele apresenta uma conexão fácil plug-and-play com PCs com um cabo USB. O design de tamanho pleno e ergonômico oferece conforto ao segurá-lo para o dia todo. Um sensor óptico de alta resolução de 1.600 DPI garante a passagem fácil de uma janela para a outra. Mouse de tamanho pleno para melhor empunhadura; Conexão USB com fio. Alta resolução em 1.600 DPI; Design ambidestro

### Especif. Técnicas

Cor	Black
Tipo de conexão	Wired via USB
Cabo comprimento/tipo	1.8 m
Peso	70 g (0.15 lbs)
Recursos especiais de Design	Ambidextrous design
Botão do mouse	3 (left click, right click, scroll click)
Botão de ligação	Left/right click - Up to 8M clicks; Scroll wheel click - Up to 100,000 clicks
DPI	1600 DPI
Sensor do mouse	Optical sensor
Requerimentos de Hardware	Supported PC with USB port
Rolagem	Scroll Wheel (up/down)
Marca	Lenovo
Requisitos de Sist. Operacional	Windows 7, Windows 8, Windows 8.1, Windows 10
Aprovações de agências	BSMI, CB, CE, EAC, FCC, ICES, KCC, RCM, Serbia, TUV-GS, UL, VCCI
Tipo de embalagem	Brown box
Altura	34 mm (1.34 in)
Comprimento	62 mm (2.45 in)
Profundidade	111 mm (4.38 in)
Período de garantia	1 Year
Temperatura máxima de operação	50 degrees Celsius (122 degrees Fahrenheit)
Temperatura mínima de operação	0 degrees Celsius (32 degrees Fahrenheit)
Umidade relativa máxima (%)	90%
Umidade relativa mínima (%)	10%
Grupo	Lenovo Fingerprint Biometric USB Mouse. Set-up and information poster
Supported Operating Systems	OS Independent

Origem: <https://www.lenovo.com/br/pt/accessories-and-monitors/keyboards-and-mice/mice/MICE-BO-Lenovo-Essential-USB-Mouse/p/4Y50R20863>



# Como atualizar o sistema BIOS

## Descrição

Descreve como atualizar o sistema BIOS.



**Cuidado:** Tenha cuidado ao atualizar o BIOS do sistema. Se o seu sistema congela, trava ou perde energia durante o processo de atualização, o firmware do BIOS ou UEFI pode estar corrompido. Isso fará com que seu sistema não inicie.

## Marcas Aplicáveis

Todos

## Sistemas operacionais

Windows 7, 8 e 10

## Solução

Assista nossos vídeos:

- [\[Vídeo\] O que é BIOS](#)
- [\[Vídeo\] Como atualizar o BIOS sistema](#)
- [\[Vídeo\] Como obter os últimos drivers e BIOS com o Lenovo Vantage](#)
- [\[Vídeo\] Como verificar a versão do BIOS](#)
- [Conheça o canal Lenovo Suporte no YouTube](#)

## **Ferramenta Lenovo para atualizar automaticamente o BIOS :**

System Update Lenovo :



[Lenovo System Update](#) é usado para atualizar e instalar drivers, BIOS e aplicativos da Lenovo. System Update Lenovo é suportada nos seguintes sistemas: ThinkPad, ThinkCentre, ThinkStation e Lenovo V, B, K, E-Series

Visite nossa home page de suporte, selecione seu **produto** > clique em **Drivers & software** > selecione **System Update**

**Nota:** A Lenovo recomenda executar o [Windows Update](#) antes de usar o Lenovo System Update.

Assista ao nosso vídeo: [Como usar o Lenovo System Update](#)

## Lenovo Vantage:



- [Lenovo Vantage](#) torna mais fácil para você tirar o máximo proveito do seu dispositivo. Isso inclui atualização de BIOS e drivers.
- Assista ao nosso vídeo: [Visão Geral do Lenovo Vantage](#)
- [Lenovo Vantage: Usar seu PC ficou mais fácil](#)
- [Obtendo drivers mais recentes \(vídeo\)](#)

## Use o Winflash para instalar a atualização do BIOS

1. Faça o download do BIOS mais recente para a área de trabalho do Windows para facilitar a localização seguindo estas etapas:
  1. Abra o [site de suporte da Lenovo \(support.lenovo.com\)](#)
  2. Digite o tipo de máquina do seu sistema ou o nome do produto.
  3. Na página do produto, clique em **Drivers & Programas**
  4. Filtrar por " BIOS / UEFI" e escolha as informações correspondentes do SO (Sistema Operacional)
  5. Baixe e instale o BIOS seguindo o arquivo read-me
2. Clique com o botão direito do mouse no pacote flash do BIOS e escolha **Executar como administrador** . (Nota: Clicar duas vezes no pacote flash do BIOS não executará este programa no Windows Vista.)
3. O Windows mostrará uma janela de extração automática, clique no botão **Instalar**.
4. Clique no " Flash BIOS " botão.
5. Uma janela de aviso será exibida para lembrar o usuário de conectar a tomada do sistema e fornecer outras informações de flash.
6. Clique no " OK" botão, atualização do BIOS piscar programa será executado automaticamente. (Nota: Aguarde até que o programa de atualização do BIOS pisque a instalação.)
7. Quando a atualização do BIOS estiver concluída, o sistema será reinicializado automaticamente.

## Informação adicional

### Como identificar a versão do BIOS :

- [Como verificar sua versão do BIOS no Windows 7, 8 e 10](#)
- [\[Vídeo\] Como entrar no BIOS Setup Utility no Windows 8, 10](#)
- [\[Solução guiada\] Como entrar no BIOS](#)

### 1. Como encontrar e baixar a versão correta do BIOS para o seu sistema

**Nota:** Se você fizer download, e instalar um BIOS destinado a um modelo de sistema diferente, seu sistema pode não funcionar.

Abra o [site de suporte da Lenovo \(support.lenovo.com\)](#) , Selecione seu **produto** > Clique em **Drivers & software** > Selecione **BIOS** > Escolha seu **sistema operacional**

Se você precisar de instruções adicionais sobre como baixar drivers e softwares veja [Como navegar e baixar software Lenovo](#) ou [drivers do site de suporte](#)

## **2. Revise a documentação incluída do README**

1. Se você seguiu as etapas acima para **Como localizar e baixar a versão correta do BIOS**, a **README** inclui informações sobre o utilitário de atualização do BIOS. Lenovo recomenda revisar as informações do **README**.

Severity	Download File	Version
normal	README for BIOS Update Utility 17.8 KB	1.21
normal	BIOS Update Utility 6.0 MB	1.21

2. O arquivo Leiamme da atualização do BIOS provavelmente incluirá uma lista de correções e novas funções, geralmente para oferecer suporte a novo hardware e específico ao seu modelo
3. Esses arquivos também contêm informações importantes sobre o procedimento de atualização e o que você deve fazer ou não fazer.

## **3. Atualize o BIOS do Windows**

1. Se possível, tente atualizar seu **BIOS** enquanto estiver usando uma fonte confiável de eletricidade. Se você atualizar o BIOS para um laptop ou outro dispositivo portátil, verifique se a bateria está totalmente carregada.
2. Essas precauções são necessárias porque apenas uma pequena flutuação de energia pode corromper o BIOS enquanto ele está sendo atualizado. Isso pode levar a um computador inutilizável.
3. Se você atualizar o BIOS partir do Windows, é preferível que você desative qualquer antivírus ou suite de segurança em execução, para que ele não bloqueie nada durante o processo de atualização.
4. O método mais simples é atualizar o **BIOS** partir do **Windows**, baixar o arquivo, extrai-lo e executar o executável, (o arquivo Read-**Me** deve conter instruções detalhadas).
5. Reinicie o computador e o BIOS é atualizado


# THE ECO DECLARATION



ECMA/TC38-TG3/2015/026  
(Rev. 1 – 15 April 2015)

## Annex B2 - Product environmental attributes Notebooks and Tablets

The declaration may be published only when all rows and/or fields marked with \* are filled-in (n.a. for not applicable).  
Additional information regarding each item may be found under P15.

Brand *	Lenovo	
Company name *	Lenovo	
Contact information * e-mail address	Lenovo Global Environmental Affairs Alvin L Carter alcarter@lenovo.com	
Internet site *	<a href="http://www.lenovo.com/social_responsibility/us/en/environment.html">http://www.lenovo.com/social_responsibility/us/en/environment.html</a>	
Additional information	The latest version of this document can be found at: <a href="http://www.lenovo.com/ecodeclaration">http://www.lenovo.com/ecodeclaration</a>	

The company declares (based on product specification or test results based obtained from sample testing), that the product conforms to the statements given in this declaration.

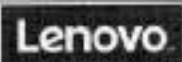
Type of product *	NOTEBOOK
Commercial name *	ThinkPad T460
Model number *	20L5, 20L6
Issue date *	2017/11/27
Intended market *	<input checked="" type="checkbox"/> Global <input type="checkbox"/> Europe <input type="checkbox"/> Asia, Pacific & Japan <input type="checkbox"/> Americas <input type="checkbox"/> Other
Additional information	

This is an uncontrolled copy when in printed form. Please refer to the contact information for the latest version.

### About Annex B2

Annex B2 reflects Product environmental attributes relevant for Computers and Computer Monitors. The following items from the ECMA-370 Main body are not shown in the template:

- P4.1 – P4.3 Consumable materials
- P9.1 TEC and Print speed
- P10.2 - P10.3 Chemical emissions from printing products
- P11.1 - P11.3 Consumable materials for printing products.

Model number *	20L5; 20L6	Logo			
Issue date *	2017/11/27				
Product environmental attributes - Legal requirements		Requirement met			
Item		Yes	No	n.a.	
<b>P1</b>	<b>Hazardous substances and preparations</b>				
P1.1*	Products do comply with current European RoHS Directive. (See legal reference and NOTE B1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P1.2*	Products do not contain Asbestos (see legal reference). Comment: Legal reference has no maximum concentration value.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P1.3*	Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbon tetrachloride, 1,1,1-trichloroethane, methyl bromide (see legal reference). Comment: Legal reference has no maximum concentration values.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P1.4*	Products do not contain more than: 0,005% polychlorinated biphenyl (PCB), 0,005% polychlorinated terphenyl (PCT) in preparations (see legal reference).	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P1.5*	Products do not contain more than 0,1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP. (see legal reference).	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P1.6*	Parts with direct and prolonged skin contact do not release nickel in concentrations above 0,5 µg/cm <sup>2</sup> /week (see legal reference). Comment: Max limit in legal reference when tested according to EN1811:2011-5.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
P1.7*	REACH Article 33 information about substances in articles is available at (add URL or mail contact): <a href="http://www.lenovo.com/social_responsibility/us/en/environment.html">http://www.lenovo.com/social_responsibility/us/en/environment.html</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>P2</b>	<b>Batteries</b>				
P2.1*	If the product contains a battery or an accumulator, the battery/accumulator is labeled with the disposal symbol. Information on proper disposal is provided in user manual. (See legal reference)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
P2.2*	Batteries or accumulators do not contain more than 0,0005% of mercury or 0,002% of cadmium. (See legal reference)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
P2.3*	Batteries and accumulators are readily removable. (See legal reference)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>P3</b>	<b>Conformity verification &amp; Eco design (ErP)</b>				
P3.1*	The product is CE-marked to show conformance with applicable legal requirements (see legal reference). The Declaration of Conformity can be requested at (add link or e-mail address): <a href="http://www.lenovo.com/social_responsibility/us/en/ec_doc_notebooks/">http://www.lenovo.com/social_responsibility/us/en/ec_doc_notebooks/</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
P3.2*	The product complies with the Eco design requirements for energy-related products, (see legal reference). Required information is: <input type="checkbox"/> given in item P15 or added to this document, <input checked="" type="checkbox"/> available at (add URL): <a href="http://www.lenovo.com/social_responsibility/us/en/datasheets_not">http://www.lenovo.com/social_responsibility/us/en/datasheets_not</a>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>P5</b>	<b>Product packaging</b>				
P5.1*	Packaging and packaging components do not contain more than 0,01% lead, mercury, cadmium and hexavalent chromium by weight of these together.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
P5.2*	The packaging materials are marked with abbreviations and numbers indicating the nature of the material(s) used (see legal reference).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
P5.3*	The product packaging material is free from ozone depleting substances as specified in the Montreal Protocol (see legal reference). Comment: Legal reference has no maximum concentration values.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>P6</b>	<b>Treatment information</b>				
P6.1*	Information for recyclers/treatment facilities is available (see legal reference).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

NOTE B1: Restriction applies to the homogeneous material, unless otherwise specified and expressed in weight %. Stating "Yes" means that the product is compliant with the mandatory requirements.

Model number *	20L5; 20L6	Logo	
Issue date *	2017/11/27		

Product environmental attributes - Market requirements (See General NOTE GN below)		Requirement met		
- Environmental conscious design		Yes	No	n.a.
Item	*=mandatory to fill in. Additional information regarding each item may be found under P14.			
<b>P7</b>	<b>Design, Disassembly, recycling</b>			
P7.1*	Parts that have to be treated separately are easily separable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.2*	Plastic materials in covers/housing have no surface coating.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.3*	Plastic parts > 100 g consist of one material or of easily separable materials.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.4*	Plastic parts > 25 g have material codes according to ISO 11469 referring ISO 1043-4.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.5	Plastic parts are free from metal inlays or have inlays that can be removed with commonly available tools.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.6*	Labels are easily separable. (This requirement does not apply to safety/regulatory labels).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Product lifetime</b>			
P7.7*	Upgrading can be done e.g. with processor, memory, cards or drives	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.8*	Upgrading can be done using commonly available tools	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.9	Spare parts are available after end of production for: 5 years			<input type="checkbox"/>
P7.10	Service is available after end of production for: 5 years			<input type="checkbox"/>
	<b>Material and substance requirements</b>			
P7.11*	Product cover/housing material type (e.g. plastics, metal, aluminum): Material type: <b>PPS+50%GF</b> Material type: <b>PC+ABS</b> Material type: <b>PA+50%GF</b>			
P7.12	Insulation materials of external electrical cables are PVC free.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.13	Insulation materials of internal electrical cables are PVC free.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.14	External plastic casing/cover parts > 25 g contain no more than 0,1% weight (1000 ppm) bromine and 0,1% weight (1000 ppm) chlorine attributable to brominated flame retardants, chlorinated flame retardants, and polyvinyl chloride or 0,3% weight (3000 ppm) bromine and 0,3% weight (3000 ppm) chlorine in parts containing more than 25% post-consumer recycled content.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.15	Printed circuit boards, PCBs (without components) are low halogen; all <input checked="" type="checkbox"/> PCBs > 25 g <input checked="" type="checkbox"/> are low halogen as defined in IEC 61249-2-21. (See 1NOTE B2)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.16	Flame retarded plastic parts > 25 g in covers / housings are marked according ISO 1043-4: Marking: <b>FR(49)</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.17	<b>Alt. 1:</b> Chemical specifications of flame retardants in printed circuit boards > 25 g (without components): <input type="checkbox"/> TBBPA (additive), <input type="checkbox"/> TBBPA (reactive) (See NOTE B3), <input checked="" type="checkbox"/> Other: <b>Phosphorus Modified Epoxy Resin</b> , CAS #: <b>confidential</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Alt. 2:</b> Chemical specifications of flame retardants in printed circuit boards (without components) > 25 g according ISO 1043-4:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.18	<b>Alt. 1:</b> Flame retarded plastic parts > 25 g contain the following flame retardant substances/preparations in concentrations above 0,1%: 1. Chemical name: <b>Phosphorus compounds</b> , CAS #: <b>confidential</b> (See NOTE B4) 2. Chemical name: , CAS #: * 3. Chemical name: , CAS #: * <b>Alt. 2:</b> Chemical specifications of flame retardants in plastic parts > 25 g according ISO 1043-4:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.19	In plastic parts > 25 g, flame retardant substances/preparations above 0,1% are used which have been assigned the following Risk phrases: <b>confidential</b> and Hazard statements: <b>confidential</b> The source(s) for these classifications is/are found at (add URL(s)): , (See note B5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
P7.20*	Postconsumer recycled plastic material content is used in the product (See Note B5):  if YES; at least one of the two alternatives below shall be answered: a) Of total plastic parts weight > 25 g, the postconsumer recycled plastic material content (calculated as a percentage of total plastic by weight) is %. or b) The weight of recycled material is 10.987 g.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL NOTE: Standard references should direct to the latest version of a standard. If an older version of a standard is used, section P15 shall be used for explanation.

NOTE B2: IEC 61249-2-21 defines maximum limits of 900 ppm for each of the substances chlorine and bromine, and a maximum limit of 1500ppm of these substances combined. The standard does not address fluorine, iodine and astatine which are included in the group of halogens.

NOTE B3 and B4: A Guidance document on Chemical substances is available; see <http://www.ecma-international.org/publicationsstandards/Ecma-379.htm>

NOTE B5: If a certain substance has been assigned a certain risk phrases / hazard statement in the referenced source, this does not necessarily mean the substance has been tested for all of the hazards referred to by a certain customer.

NOTE B6: Applies to a product containing plastic parts whose combined weight exceeds 100 g with the exception of printed circuit boards, cables, connectors and electronic components and bio-based plastic material.

Model number *		20L5;20L6		Logo	
Issue date *		2017/11/27			
Product environmental attributes - Market requirements (continued)					Requirement met
Item					Yes No n.a.
<b>Material and substance requirements (continued)</b>					
P7.21*	Biobased plastic material content is used in the product (See NOTE B7); If YES; at least one of the two alternatives below shall be answered; a) Of total plastic parts weight > 25 g, the biobased plastic material content (calculated as a percentage of total plastic by weight) is %. or b) The weight of the biobased plastic material is g				<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
P7.22*	Light sources are free from mercury, i.e. less than 0,1 mg/lamp. If mercury is used specify: Number of lamps: and maximum mercury content per lamp: mg				<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>P8 Batteries</b>					
P8.1*	Battery chemical composition: <i>Lithium ion/Lithium Manganese Dioxide</i>				<input type="checkbox"/>
<b>P9 Energy consumption (See NOTE B8)</b>					
P9.1 For the product the following power levels or energy consumptions are reported:					
Energy mode *	Power level at 100 V AC	Power level at 115 V AC	Power level at 230 V AC	Reference/Standard for energy modes and test method *	<input type="checkbox"/>
Peak (On-max)	65 W	65 W	65 W	Full load	
<b>Category I1</b>					
Short Idle State - WOL Enabled	5.90 W	5.82 W	5.71 W	Use for ENERGY STAR V6 registration ( $P_{Idle}$ )	
Long Idle State - WOL Enabled	3.29 W	3.25 W	3.12 W	Use for ENERGY STAR V6 registration ( $P_{Idle}$ )	
Sleep (S3) - WOL Enabled	0.83 W	0.83 W	0.82 W	Use for ENERGY STAR V6 registration ( $P_{Sleep}$ )	
Sleep (S3) - WOL Disabled	0.76 W	0.76 W	0.77 W	Reference	
Off (S5) - WOL Enabled	0.40 W	0.40 W	0.38 W	Use for ENERGY STAR V6 registration ( $P_{Off}$ )	
Off (S5) - WOL Disabled	0.38 W	0.38 W	0.37 W	Use for ErP	
<b>Category I2</b>					
Short Idle State - WOL Enabled	7.28 W	8.18 W	7.79 W	Use for ENERGY STAR V6 registration ( $P_{Idle}$ )	
Long Idle State - WOL Enabled	5.10 W	5.95 W	5.02 W	Use for ENERGY STAR V6 registration ( $P_{Idle}$ )	
Sleep (S3) - WOL Enabled	0.91 W	0.92 W	0.91 W	Use for ENERGY STAR V6 registration ( $P_{Sleep}$ )	
Sleep (S3) - WOL Disabled	0.83 W	0.85 W	0.83 W	Reference	
Off (S5) - WOL Enabled	0.41 W	0.41 W	0.40 W	Use for ENERGY STAR V6 registration ( $P_{Off}$ )	
Off (S5) - WOL Disabled	0.37 W	0.37 W	0.37 W	Use for ErP	
EPS No-load (External power supply (charger) plugged in the wall outlet but disconnected from the product)	W	W	W		
PTEC Typical Energy Consumption	W	W	W		<input type="checkbox"/>
ETEC Annual Energy Consumption	29.29 kWh/year	30.43 kWh/year	28.54 kWh/year	$E_{TEC} = (8760/1000) \times (P_{Off} \times 0.25 + P_{Sleep} \times 0.35 + P_{Standby} \times 0.10 + P_{Standby} \times 0.30)$	<input type="checkbox"/>
External Power Supply Efficiency Level (International Efficiency Marking Protocol) * : W					<input type="checkbox"/>

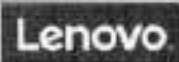
NOTE B7 The following is to be excluded from the calculation of percentage: printed circuit boards, labels, cables, connectors and electronic components and post-consumer recycled plastic.

NOTE B8 A Guidance document on Energy Efficiency is available;  
see <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

NOTE B9 A Guidance document on Acoustic Noise is available;  
see <http://www.ecma-international.org/publications/standards/Ecma-370.htm>

Display resolution * : 2.074 (1920*1080) megapixels		<input type="checkbox"/>
Default time to enter energy save mode: 30 minutes		<input type="checkbox"/>
P9.2	Information about the energy save function is provided with the product.	<input checked="" type="checkbox"/> <input type="checkbox"/>
P9.3	Energy efficiency class (monitors only):	<input type="checkbox"/>
<b>P10 Emissions</b>		
<b>Noise emission – Declared according to ISO 9296 (See NOTE B9)</b>		
P10.1	Mode	Mode description
	Idle	* HDD idle
	Operation	* Operating (HDD) * Operating (CPU)
	Other mode	Declared A-weighted sound pressure level (dB) $L_{p,dm}$
	Other mode	Declared A-weighted sound pressure level (dB) $L_{p,dm}$
		Statistical upper limit A-weighted sound power level, $L_{WA,p}$ (B)
		2.9
		2.9
		3.5
		21 (operator position desktop – idle)
		22 (operator position desktop – operating HDD)
		27 (operator position desktop – operating CPU)
	Measured according to: <input checked="" type="checkbox"/> ISO 7779 <input checked="" type="checkbox"/> ECMA-74	
	<input type="checkbox"/> Other (only if not covered by ECMA-74)	



Model number *	20L5;20L6	Logo	
Issue date *	2017/11/27		
Product environmental attributes - Market requirements (continued)			Requirement met
Item			Yes No n.a.
<b>Electromagnetic emissions</b>			
P10.4	Computer display meets the requirement for low frequency electromagnetic fields of the following voluntary program(s): <i>MPR-W3 pin AC adapter only</i>		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>P12 Ergonomics for computing products</b>			
P12.1'	The display meets the ergonomic requirements of ISO 9241-307 for visual display technologies.		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
P12.2'	The physical input device meets the requirements of ISO 9995 and ISO 9241-410.		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>P13 Packaging and documentation</b>			
P13.1'	Product packaging material type(s): <i>Corrugated Cardboard</i> weight (kg): <b>0.458</b>		
	Product packaging material type(s): <b>100% Recycled Polyethylene (RLDPE)</b> weight (kg): <b>0.144</b>		
	Product packaging material type(s): <i>Others (Polyethylene bags)</i> weight (kg): <b>0.033</b>		
P13.2'	Product plastic primary packaging is free from PVC.		<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
P13.3'	For product primary corrugated fiberboard packaging, specify the contained percentage of minimum post-consumer recovered fiber content: <b>70 (Japan only) %</b>		<input type="checkbox"/>
P13.4'	Specify media for user and product documentation (tick box): <input checked="" type="checkbox"/> Electronic, <input checked="" type="checkbox"/> Paper, <input type="checkbox"/> Other		<input type="checkbox"/>
P13.5	(Please only complete this item if paper documentation used) User and product documentation on paper media is chlorine-free: If Yes, please specify:  Totally chlorine-free Elemental chlorine-free Processed chlorine-free		<input checked="" type="checkbox"/> <input type="checkbox"/>  <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<b>P14 Voluntary programs</b>			
P14.1	The product meets the requirements of the following voluntary program(s):		
	ENERGY STAR®	Criteria version: <b>6.1</b>	Date: <b>2017/11/7</b> Product category: <b>IT &amp; I2</b>
	Eco-label: <b>EPEAT</b>	Criteria version: <b>1600.1</b>	Date: <b>2018/1/30</b> Product category: <b>Notebook</b>
	Eco-label: <b>PCGL</b>	Criteria version: <b>Ver.13</b>	Date: <b>2018/1/30</b> Product category: <b>Notebook</b>
	Eco-label: <b>TCO</b>	Criteria version: <b>NB5.0</b>	Date: Product category: <b>Notebook</b>
	Eco-label:	Criteria version:	Date: Product category:
<b>P15 Additional information (See NOTE B10)</b>			
P9	<b>Energy consumption of specific configuration may vary; description of the tested product configuration:</b>		
	NOTE: Supplier makes no representations, guarantees, assurances or warranties whether express or implied, regarding the information contained in this document. All information provided by supplier in this document is provided based on supplier's knowledge available at the time of completion, and supplier shall have no obligation to update such information. The information provided here is approximate and provided for informational purposes only. See a Lenovo Account Representative for more information.		
P9	See Energy Star Qualified Notebooks & Tablet Computers for the latest information: <a href="http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&amp;pgw_code=CO">http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&amp;pgw_code=CO</a>		

NOTE B10: Additional lines may be inserted to declare further items, by positioning the cursor at the far right of the row and hitting the <Enter> key.

## Legal references Europe Annex B2

Reference	Declaration item
Directive 2011/65/EU (RoHS Directive) * * Specific exemptions apply for certain products and applications.	P1.1
Regulation (EC) 1907/2006(REACH, Annex XVII)	P1.2, P1.4, P1.6, P1.7
Regulation (EC) 2037/2000, 2038/2000, 2039/2000 (Marketing and use of Ozone layer depleting substances)	P1.3, P5.3
Norwegian regulation relating to restrictions on the use of certain dangerous chemicals 20.12.2002	P1.5
Directive 2013/56/EC (Battery and accumulators Directive) * * These provisions shall not apply where, for safety, performance, medical or data integrity reasons, continuity of power supply is necessary and requires a permanent connection between the appliance and the battery or accumulator.	P2.1, P2.2, P2.3, P8.1
Directive 2006/95/EC (Low Voltage Directive)	P3.1
Directive 2004/108/EC (EMC Directive)	P3.1
Directive 1999/5/EC (R&TTE Directive)	P3.1
Regulation (EC) 801/2013 amending Regulation (EC) No 1275/2008 with regard to ecodesign requirements for standby, off mode electric power consumption of electrical and electronic household and office equipment, and amending Regulation (EC) No 642/2009 with regard to ecodesign requirements for televisions	P3.1, P3.2
Regulation (EC) No 1272/2008 (CLP Regulation)	P7.19
Directive 2004/12/EC ( Packaging Directive)	P5.1
Decision 97/129/EC (Secondary packaging legislation)	P5.2
Directive 2012/19/EU (WEEE directive)	P6.1

# Lenovo ErP Lot3 Information Sheet

## - PC / Notebook -

As required by COMMISSION REGULATION (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers (ErP Lot3).

### Products scope of this sheet:

Desktop computer, integrated desktop computer, and notebook computer

This document is only valid in connection with the IT Eco Declaration of the specific Product.

Commercial name	ThinkPad T480	Logo 
Model Number	20L5;20L6	
Issue Date	2017/11/27	
Additional information		

P7.1.1 Product environmental attributes					
(d)	Year of manufacture:		2018		
(e)	Etec value (kWh) per ErP Lot 3 Category and capability adjustments applied when all discrete graphics cards (dGfx) are disabled and if the system is tested with switchable graphics mode with UMA driving the display.				
(f)	Etec value (kWh) per ErP Lot 3 Category and capability adjustments applied when all discrete graphics cards (dGfx) are enable				
		<b>Category A</b> <small>(according to ErP Lot 3)</small>	<b>Category B</b> <small>(according to ErP Lot 3)</small>	<b>Category C</b> <small>(according to ErP Lot 3)</small>	<b>Category D</b> <small>(according to ErP Lot 3)</small>
capability adjustments applied during testing	Memory over base [GB]	28	28		
	Additional internal storage	Yes <small>(Yes / No)</small>	Yes <small>(Yes / No)</small>	<small>(Yes / No)</small>	<small>(Yes / No)</small>
	Discrete television tuner	No <small>(Yes / No)</small>	No <small>(Yes / No)</small>	<small>(Yes / No)</small>	<small>(Yes / No)</small>
	Discrete Audio Card	No <small>(Yes / No)</small>	No <small>(Yes / No)</small>	<small>(Yes / No)</small>	<small>(Yes / No)</small>
	Discrete graphics Card(s) [number / #]	No # <small>(Yes / No)</small>	Yes # 1 <small>(Yes / No)</small>	# <small>(Yes / No)</small>	# <small>(Yes / No)</small>
	Category of discrete graphics Card(s)	NA	G3		
Test results	Etec Value (kWh) - dGfx disabled <small>all discrete graphics cards (dGfx) are disabled/ UMA is active for switchable graphics/ product has no graphics cards (dGfx)</small>	16.78			
	Etec Value (kWh) - dGfx enabled <small>all discrete graphics cards (dGfx) are enabled</small>		18.46		
(g)	Idle state power demand (Watts):		A: 5.078; B: 5.973		
(h)	Sleep mode power demand (Watts):		A: 0.718; B: 0.835		
(i)	Sleep mode with WOL enabled power demand (Watts) (where enabled):		A: 0.781; B: 0.889		
(j)	Off mode power demand (Watts):		A: 0.409; B: 0.375		
(k)	Off mode with WOL enabled power demand (Watts) (where enabled):		A: 0.410; B: 0.377		
(l)	Internal power supply efficiency at 10 %, 20 %, 50 % and 100 % of rated output power (if applicable):				
	10%	20%	50%	100%	Average
(m)	External power supply efficiency (if applicable):  Average active efficiency: 45W USB Type-C: 87.92%, 89.31%, 89.35%, 88.96%, 65W USB Type-C: 91.01%, 90.38%, 90.25%, 88.54%, 45W: 87.98%, 88.63%, 88.83%, 55W: 89.41%, 88.62%, 88.96%  <small>*internal note: show values for all available external power supplies</small>				
(o)	Minimum number of loading cycles that the batteries can withstand (applies only to notebook computers):		500 cycles		
(p-1)	Measurement methodology used to determine information mentioned in points (l) – internal PSU efficiency:  NA				

(p-2)	Measurement methodology used to determine information mentioned in points (m) – external PSU efficiency: <b>EPA "Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies" dated August 11, 2004</b>	
(p-3)	Measurement methodology used to determine information mentioned in points (o) – loading cycles batteries: <b>IEC 61950 measurement methodology</b>	
(p-4)	Measurement methodology used to determine information mentioned in maximum, idle, sleep, off mode power as defined in Point P9.1 in the Product IT Eco Declaration: <b>IEC 62623 / IEC EN50564:2011 measurement methodology</b>	
(q)	Sequence of steps for achieving a stable condition with respect to power demand: <b>IEC 62623 / IEC EN50564:2011 measurement methodology</b>	
(r)	Description of how sleep and/or off mode was selected or programmed: <b>refer to power management, sleep mode: ACPI system level G1/S3 (suspend to RAM) state; off mode: ACPI system level G2/S5 ('soft off') state</b>	
(s)	Sequence of events required to reach the mode where the equipment automatically changes to sleep and/or off mode: <b>refer to power management, 30mins automatically reaches sleep mode</b>	
(t)	Duration of idle state condition before the computer automatically reaches sleep mode, or another condition which does not exceed the applicable power demand requirements for sleep mode (in minutes):	30
(u)	Length of time after a period of user inactivity in which the computer automatically reaches a power mode that has a lower power demand requirement than sleep mode (in minutes):	NA
(v)	Length of time before the display sleep mode is set to activate after user inactivity (in minutes):	10
(w)	Information on the energy-saving potential of power management functionality: <b>refer to user manual</b>	
(x)	User information on how to enable the power management functionality: <b>refer to user manual</b>	
(z)	Test parameters for measurements: — test voltage in V and frequency in Hz, — total harmonic distortion of the electricity supply system, — information and documentation on the instrumentation, set-up and circuits used for electrical testing: <b>230V/50HZ, Total Harmonic Distortion&lt;2%</b>	

**Additional Notebook Battery Information:**

	Battery(ies) <b>not</b> user replaceable	Battery(ies) user replaceable	n/a
	The battery(ies) in this product cannot be easily replaced by users themselves. <sup>1)</sup>		
Internal/built-in Battery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External/detachable Battery	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bios Backup Battery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Additional information**

1)  
 The battery(ies) in this product cannot be easily replaced by users themselves.  
 Akumulátor(ia)ta(b)at(e)k(ek) a tápellátás(ak) a termékből nem választható ki egyszerűen.  
 Les baterías de este producto no pueden ser sustituidas fácilmente por los propios usuarios.  
 Výměna baterií/baterií v tomto výrobku by neměl provádět sám uživatel.  
 Brugeren kan ikke uden videre udskifte batteriet/baterierne i dette produkt.  
 Der Akku/die Akkus dieses Produkts kann/können nicht ohne weiteres vom Benutzer selbst ausgetauscht werden.  
 Kesitettävät ei saa sellä tavalla akut/akusid iše hõõpsasti asendada.  
 Η (αποσπώ-)ση του προϊόντος από τον χρήστη να αντικατασταθούν εύκολα από τον ίδιο τον χρήστη.  
 Les/bateri(e)s présent(e)s dans ce produit ne peuvent être facilement remplacé(s) par les utilisateurs eux-mêmes.  
 Korisnik ne može lako zamjeniti Bateriju sam u ovom proizvodu.  
 Le batterie/le batterie in questo prodotto non può/possono essere facilmente sostituite/dal utente.  
 Lierit(ä)j(ät) peeli naurar nomahti äik rakkjama akumuletoru(-es).  
 Šio gamtinio baterija(s) (baterijų) peili vertojamas negali lengvai pakeisti.  
 A termék akkumulátor/akkumulátorai a felhasználó nem tudja egyszerűen kicserélni.  
 Il-batterija/batterij f'dan il-prodott ma tistaxx/istgħux iġi/ji/ju sostitwta' mill-utent stess.  
 Bateriet (ene) i dette produktet kan ikke let erstattes av brukerne selv.  
 De batteri(er) in dit product is (zijn) door de gebruiker niet gemakkelijk vervangbaar.  
 Użytkownik nie może sam w łatwy sposób wymienić baterii w tym produkcie.  
 A ou as baterias deste produto não podem ser facilmente substituidas pelos próprios utilizadores.  
 Bateris (bateri(e) din acest produs nu poate (pot) fi ușor înlocuit(ă) de utilizatori(ri) însiși.  
 Bateri(u)le v tomto výrobku nemôže vymeniť používateľ.  
 Bateri(baterije v tem izdelku uporabniki sami ne morejo zlahka zamenjati.  
 Tämän tuotteen akku (akut) ei/vai) ole helposti vaihdettavissa.  
 Det är inte enkelt för kunden att själv byta ut batteriet/baterierna.  
 Bu ürüneki batarya(ları) kullanıcilar tarafından kolaylıkla değiştirilemez.



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LCC Rubinteh

Certificador: UL Nº Certificado: UL-BR 15.0348 Tipo: Produto Emissão: 11/05/2015 Validade: 10/05/2020 Status do Certificado: Ativo Doc.Normativo

CNPJ/CPF	Razão Social / Nome (PF)	Nome fantasia	Endereço	Status	Papel da empresa
07275920000164	LENOVO TECNOLOGIA (BRASIL) LTDA	LENOVO	ESTM JOSÉ COSTA DE MESQUITA, 200 - MÔD 5 A11 - SAPEZAL - INDAIATUBA, SP - BRASIL	ATIVO	SOLICITANTE/FABRICANTE
☒ Marca	☒ Modelo	☒ Importado	☒ Descrição		
LENOVO	20BW	NÃO	NOTEBOOK		
LENOVO	20CLXXXXXXXX	NÃO	NOTEBOOK		
LENOVO	20DS	NÃO	NOTEBOOK		
LENOVO	20F9	NÃO	NOTEBOOK		
LENOVO	20FA	NÃO	NOTEBOOK		
LENOVO	20FM	NÃO	NOTEBOOK		
LENOVO	20FN	NÃO	NOTEBOOK		
LENOVO	20FU	NÃO	NOTEBOOK		
LENOVO	20FV	NÃO	NOTEBOOK		
LENOVO	20H1	NÃO	NOTEBOOK		
LENOVO	20H2	NÃO	NOTEBOOK		
LENOVO	20H3	NÃO	NOTEBOOK		
LENOVO	20HD	NÃO	NOTEBOOK		
LENOVO	20HE	NÃO	NOTEBOOK		
LENOVO	20HM	NÃO	NOTEBOOK		
LENOVO	20HN	NÃO	NOTEBOOK		
LENOVO	20JM	NÃO	NOTEBOOK		
LENOVO	20JN	NÃO	NOTEBOOK		
LENOVO	20K5	NÃO	NOTEBOOK		
LENOVO	20K6	NÃO	NOTEBOOK		
LENOVO	20KFXXXXX	NÃO	NOTEBOOK		
LENOVO	20KQXXXXX	NÃO	NOTEBOOK		
LENOVO	20KRXXXXX	NÃO	NOTEBOOK		
LENOVO	20KFXXXXX	NÃO	NOTEBOOK		
LENOVO	20L1XXXXX	NÃO	COMPUTADOR NOTEBOOK		
LENOVO	20L2XXXXX	NÃO	COMPUTADOR NOTEBOOK		
LENOVO	20L6XXXXX	NÃO	COMPUTADOR NOTEBOOK		
LENOVO	20M5XXXXX	NÃO	COMPUTADOR NOTEBOOK		
LENOVO	20M6XXXXX	NÃO	COMPUTADOR NOTEBOOK		
LENOVO	20M7XXXXX	NÃO	COMPUTADOR NOTEBOOK		

LENOVO	20M8XXXXX	NÃO	COMPUTADOR NOTEBOOK
LENOVO	20N8	NÃO	NOTEBOOK
LENOVO	20N9	NÃO	NOTEBOOK
LENOVO	E480, MODEL(S) 20KNXXXXX	NÃO	NOTEBOOK
LENOVO	T450, MODEL(S) 20L5XXXXX	NÃO	NOTEBOOK
LENOVO	THINKPAD T450	NÃO	NOTEBOOK
LENOVO	X280 MODEL(S) 20KEXXXXX,	NÃO	NOTEBOOK

**ThinkPad®**

T480 User Guide

**ThinkPad**

**Lenovo**



**Note:** Before using this information and the product it supports, ensure that you read and understand the following:

- *Safety and Warranty Guide*
- *Setup Guide*
- "Important safety information" on page v

The latest *Safety and Warranty Guide*, *Setup Guide*, and the *Regulatory Notice* are available on the Lenovo Support Web site at:

<http://www.lenovo.com/support>

**First Edition (January 2018)**

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---

## Important safety information

**Note:** Read the important safety information first.

---

### Read this first

This information can help you safely use your notebook computer. Follow and retain all information included with your computer. The information in this document does not alter the terms of your purchase agreement or the Lenovo Limited Warranty. For more information, see "Warranty Information" in the *Safety and Warranty Guide* that comes with your computer.

Customer safety is important. Our products are developed to be safe and effective. However, personal computers are electronic devices. Power adapters and other features can create potential safety risks that can result in physical injury or property damage, especially if misused. To reduce these risks, follow the instructions included with your product, observe all warnings on the product and in the operating instructions, and review the information included in this document carefully. By carefully following the information contained in this document and provided with your product, you can help protect yourself from hazards and create a safer computer work environment.

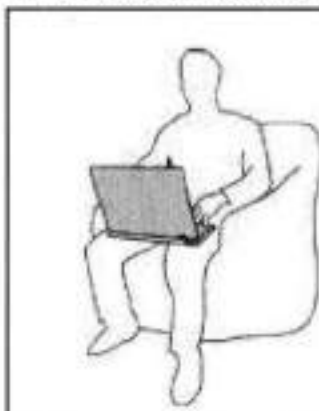
**Note:** This information includes references to power adapters and batteries. In addition to notebook computers, some products (such as speakers and monitors) ship with external power adapters. If you have such a product, this information applies to your product. In addition, computer products contain a coin-sized internal battery that provides power to the system clock even when the computer is unplugged, so the battery safety information applies to all computer products.

---

### Important information about using your computer

Ensure that you follow the important tips given here to get the most use and enjoyment out of your computer. Failure to do so might lead to discomfort or injury, or cause the computer to fail.

#### Protect yourself from the heat that your computer generates.



When your computer is turned on or the battery is charging, the base, the palm rest, and some other parts may become hot. The temperature they reach depends on the amount of system activity and the level of charge in the battery.

Extended contact with your body, even through clothing, could cause discomfort or even a skin burn.

- Avoid keeping your hands, your lap, or any other part of your body in contact with a hot section of the computer for any extended time.
- Periodically take hands from using the keyboard by lifting your hands from the palm rest.

### Protect yourself from the heat generated by the ac power adapter.



When the ac power adapter is connected to an electrical outlet and your computer, it generates heat.

Extended contact with your body, even through clothing, may cause a skin burn.

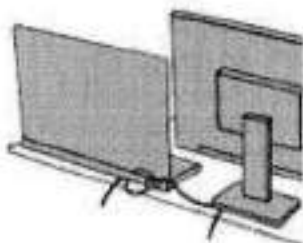
- Do not place the ac power adapter in contact with any part of your body while it is in use.
- Never use it to warm your body.

### Prevent your computer from getting wet.



To avoid spills and the danger of electrical shock, keep liquids away from your computer.

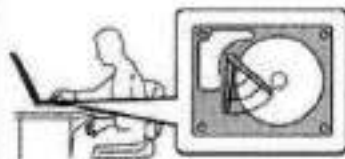
### Protect the cables from being damaged.



Applying strong force to cables may damage or break them.

Route communication lines, or the cables of an ac power adapter, a mouse, a keyboard, a printer, or any other electronic device, so that they cannot be walked on, tripped over, pinched by your computer or other objects, or in any way subject to treatment that could interfere with the operation of your computer.

### Protect your computer and data when moving it.

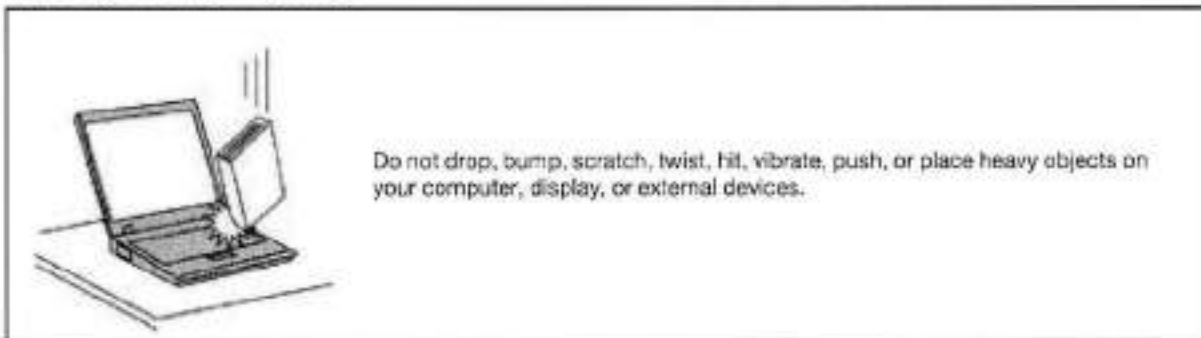


Before moving a computer equipped with a hard disk drive, do one of the following:

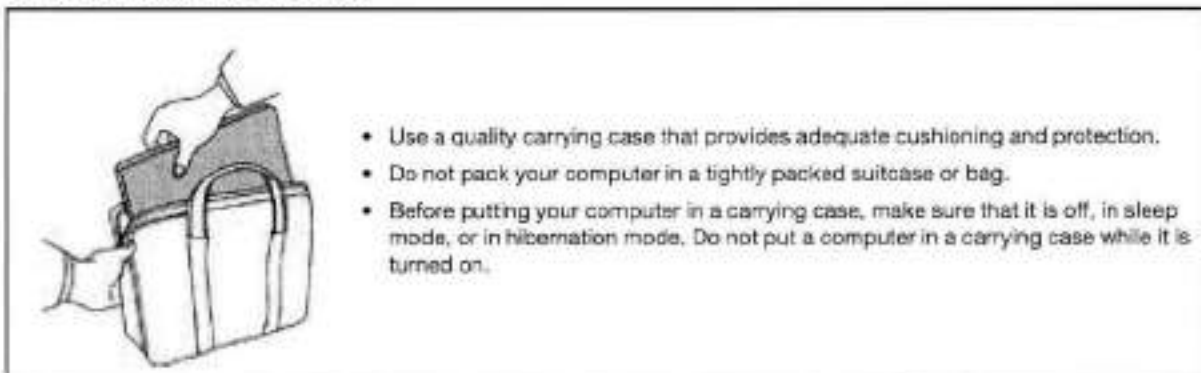
- Turn it off.
- Put it in sleep mode.
- Put it in hibernation mode.

This helps to prevent damage to the computer, and possible loss of data.

### Handle your computer gently.



### Carry your computer carefully.



## Conditions that require immediate action

Products can become damaged due to misuse or neglect. Some product damage is serious enough that the product should not be used again until it has been inspected and, if necessary, repaired by an authorized servicer.

As with any electronic device, pay close attention to the product when it is turned on. On very rare occasions, you might notice an odor or see a puff of smoke or sparks vent from your product. Or you might hear sounds like popping, cracking or hissing. These conditions might merely mean that an internal electronic component has failed in a safe and controlled manner. Or, they might indicate a potential safety issue. However, do not take risks or attempt to diagnose the situation yourself.

Contact the Customer Support Center for further guidance. For a list of Service and Support phone numbers, see the following Web site:

<http://www.lenovo.com/support/phone>

Frequently inspect your computer and its components for damage or wear or signs of danger. If you have any question about the condition of a component, do not use the product. Contact the Customer Support Center or the product manufacturer for instructions on how to inspect the product and have it repaired, if necessary.

In the unlikely event that you notice any of the following conditions, or if you have any safety concerns with your product, stop using the product and unplug it from the power source and telecommunication lines until you can speak to the Customer Support Center for further guidance.

- Plugs, power adapters, extension cords, surge protectors, or power supplies that are cracked, broken, or damaged.

- Signs of overheating, smoke, sparks, or fire.
- Damage to a battery (such as cracks, dents, or creases), discharge from a battery, or a buildup of foreign substances on the battery.
- A cracking, hissing or popping sound, or strong odor that comes from the product.
- Signs that liquid has been spilled or an object has fallen onto the computer product or the power adapter.
- The computer product or power adapter has been exposed to water.
- The product has been dropped or damaged in any way.
- The product does not operate normally when you follow the operating instructions.

**Note:** If you notice these conditions with a product (such as an extension cord) that is not manufactured for or by Lenovo, stop using that product until you can contact the product manufacturer for further instructions, or until you get a suitable replacement.

---

## Service and upgrades

Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center or your documentation. Only use a Service Provider who is approved to repair your particular product.

**Note:** Some computer parts can be upgraded or replaced by the customer. Upgrades typically are referred to as options. Replacement parts approved for customer installation are referred to as Customer Replaceable Units, or CRUs. Lenovo provides documentation with instructions when it is appropriate for customers to install options or replace CRUs. You must closely follow all instructions when installing or replacing parts. Before you remove the covers from a product equipped with a power adapter, always make sure that the power is turned off and that the product is unplugged from any power source. If you have any questions or concerns, contact the Customer Support Center.

Although there are no moving parts in your computer after the power adapter has been disconnected, the following warnings are required for your safety.



**CAUTION:**  
Hazardous moving parts. Keep fingers and other body parts away.

**CAUTION:**



Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.



---

## Power adapters



Use only the power adapters supplied by the product manufacturer.

Never wrap a power adapter cable around a power adapter or other object. Doing so can stress the cord in ways that can cause the power adapter cable to fray, crack, or crimp. This can present a safety hazard.

Always route the power adapter cable so that they will not be walked on, tripped over, or pinched by objects.

Protect power adapters from liquids. For instance, do not leave your power adapter near sinks, tubs, toilets, or on floors that are cleaned with liquid cleansers. Liquids can cause a short circuit, particularly if the power adapter has been stressed by misuse. Liquids also can cause gradual corrosion of the connector terminals on a power adapter, which can eventually result in overheating.

Ensure that all power adapter connectors are securely and completely plugged into receptacles.

Do not use any power adapter that shows corrosion at the ac input pins or shows signs of overheating (such as deformed plastic) at the ac input pins or anywhere on the power adapter.

To prevent possible overheating, do not cover the power adapter with clothing or other objects when the power adapter is plugged into an electrical outlet.

---

## Extension cords and related devices

Ensure that extension cords, surge protectors, uninterruptible power supplies, and power strips that you use are rated to handle the electrical requirements of the product. Never overload these devices. If power strips are used, the load should not exceed the power strip input rating. Consult an electrician for more information if you have questions about power loads, power requirements, and input ratings.

---

## Plugs and outlets



If a receptacle (power outlet) that you intend to use with your computer equipment appears to be damaged or corroded, do not use the outlet until it is replaced by a qualified electrician.

Do not bend or modify the plug. If the plug is damaged, contact the manufacturer to obtain a replacement.

Do not share an electrical outlet with other home or commercial appliances that draw large amounts of electricity; otherwise, unstable voltage might damage your computer, data, or attached devices.

Some products are equipped with a three-pronged plug. This plug fits only into a grounded electrical outlet. This is a safety feature. Do not defeat this safety feature by trying to insert it into a non-grounded outlet. If you cannot insert the plug into the outlet, contact an electrician for an approved outlet adapter or to replace the outlet with one that enables this safety feature. Never overload an electrical outlet. The overall system load should not exceed 80 percent of the branch circuit rating. Consult an electrician for more information if you have questions about power loads and branch circuit ratings.

Be sure that the power outlet you are using is properly wired, easily accessible, and located close to the equipment. Do not fully extend power adapter cable in a way that will stress the cords.

Be sure that the power outlet provides the correct voltage and current for the product you are installing.

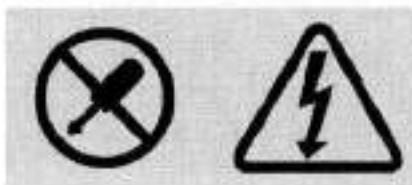
Carefully connect and disconnect the equipment from the electrical outlet.

---

## Power supply statement



Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

---

## External devices

### CAUTION:

Do not connect or disconnect any external device cables other than Universal Serial Bus (USB) and 1394 cables while the computer power is on; otherwise, you might damage your computer. To avoid possible damage to attached devices, wait at least five seconds after the computer is shut down to disconnect external devices.

---

## General battery notice



Batteries supplied by Lenovo for use with your product have been tested for compatibility and should only be replaced with approved parts. A battery other than the one specified by Lenovo, or a disassembled or modified battery is not covered by the warranty.

Battery abuse or mishandling can cause overheating, liquid leakage, or an explosion. To avoid possible injury, do the following:

- Do not open, disassemble, or service any battery.
- Do not crush or puncture the battery.
- Do not short-circuit the battery, or expose it to water or other liquids.
- Keep the battery away from children.
- Keep the battery away from fire.

Stop using the battery if it is damaged, or if you notice any discharge or the buildup of foreign materials on the battery leads.

Store the rechargeable batteries or products containing the rechargeable batteries at room temperature, charged to approximately 30 to 50% of capacity. We recommend that the batteries be charged about once per year to prevent overdischarge.

Do not put the battery in trash that is disposed of in landfills. When disposing of the battery, comply with local ordinances or regulations.

---

## Notice for removable rechargeable battery



Only recharge the battery strictly according to instructions included in the product documentation.

If the battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substances.

---

## Notice for built-in rechargeable battery



Do not attempt to remove or replace the built-in rechargeable battery. Replacement of the battery must be done by a Lenovo-authorized repair facility or technician.

Only recharge the battery strictly according to instructions included in the product documentation.

The Lenovo-authorized repair facilities or technicians recycle Lenovo batteries according to local laws and regulations.

---

## Notice for non-rechargeable coin-cell battery



If the coin-cell battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substance.

Do not heat to more than 100°C (212°F).

The following statement applies to users in the state of California, U.S.A.

California Perchlorate Information:

Products containing manganese dioxide lithium coin-cell batteries may contain perchlorate.

Perchlorate Material - special handling may apply, See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate>

---

## Heat and product ventilation



Computers, ac power adapters, and many accessories can generate heat when turned on and when batteries are charging. Notebook computers can generate a significant amount of heat due to their compact size. Always follow these basic precautions:

- When your computer is turned on or the battery is charging, the base, the palm rest, and some other parts may become hot. Avoid keeping your hands, your lap, or any other part of your body in contact with a hot section of the computer for any extended length of time. When you use the keyboard, avoid keeping your palms on the palm rest for a prolonged period of time. Your computer generates some heat during normal operation. The amount of heat depends on the amount of system activity and the battery charge level. Extended contact with your body, even through clothing, could cause discomfort or even a skin burn. Periodically take breaks from using the keyboard by lifting your hands from the palm rest; and be careful not to use the keyboard for any extended length of time.
- Do not operate your computer or charge the battery near flammable materials or in explosive environments.
- Ventilation slots, fans and/or heat sinks are provided with the product for safety, comfort, and reliable operation. These features might inadvertently become blocked by placing the product on a bed, sofa, carpet, or other flexible surface. Never block, cover, or disable these features.
- When the ac power adapter is connected to an electrical outlet and your computer, it generates heat. Do not place the adapter in contact with any part of your body while using it. Never use the ac power adapter to warm your body. Extended contact with your body, even through clothing, may cause a skin burn.

For your safety, always follow these basic precautions with your computer:

- Keep the cover closed whenever the computer is plugged in.
- Regularly inspect the outside of the computer for dust accumulation.
- Remove dust from vents and any perforations in the bezel. More frequent cleanings might be required for computers in dusty or high-traffic areas.
- Do not restrict or block any ventilation openings.
- Do not operate your computer inside furniture, as this might increase the risk of overheating.
- Airflow temperatures into the computer should not exceed 35°C (95°F).

---

## Electrical current safety information



Electric current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not use your computer during a lightning storm.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect power adapter to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- Whenever possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the power adapter and all the cables before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Do not use your computer until all internal parts enclosures are fastened into place. Never use the computer when internal parts and circuits are exposed.



Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power adapter to outlets.
5. Turn devices ON.

To disconnect:

1. Turn everything OFF.
2. First, remove power adapter from outlets.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

The power adapter must be disconnected from the wall outlet or receptacle before installing all other electrical cables connected to the computer.

The power adapter may be reconnected to the wall outlet or receptacle only after all other electrical cables have been connected to the computer.

---

## Liquid crystal display (LCD) notice

### CAUTION:

The liquid crystal display (LCD) is made of glass, and rough handling or dropping the computer can cause the LCD to break. If the LCD breaks and the internal fluid gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes; if any symptoms are present after washing, get medical care.

**Note:** For products with mercury-containing fluorescent lamps (for example, non-LED), the fluorescent lamp in the liquid crystal display (LCD) contains mercury; dispose of according to local, state, or federal laws.

---

## Using headphones or earphones

### **CAUTION:**

**Excessive sound pressure from earphones and headphones can cause hearing loss. Adjustment of the equalizer to maximum increases the earphone and headphone output voltage and the sound pressure level. Therefore, to protect your hearing, adjust the equalizer to an appropriate level.**

Excessive use of headphones or earphones for a long period of time at high volume can be dangerous if the output of the headphone or earphone connectors do not comply with specifications of EN 50332-2. The headphone output connector of your computer complies with EN 50332-2 Sub clause 7. This specification limits the computer's maximum wide band true RMS output voltage to 150 mV. To help protect against hearing loss, ensure that the headphones or earphones you use also comply with EN 50332-2 (Clause 7 limits) for a wide band characteristic voltage of 75 mV. Using headphones that do not comply with EN 50332-2 can be dangerous due to excessive sound pressure levels.

If your Lenovo computer came with headphones or earphones in the package, as a set, the combination of the headphones or earphones and the computer already complies with the specifications of EN 50332-1. If different headphones or earphones are used, ensure that they comply with EN 50332-1 (Clause 6.5 Limitation Values). Using headphones that do not comply with EN 50332-1 can be dangerous due to excessive sound pressure levels.

---

## Choking hazard notice



CHOKING HAZARD – Product contains small parts.

Keep away from children under three years.

---

## Plastic bag notice



Plastic bags can be dangerous. Keep plastic bags away from babies and children to avoid danger of suffocation.

---

## Glass parts notice

### **CAUTION:**

Some parts of your product may be made of glass. This glass could break if the product is dropped on a hard surface or receives a substantial impact. If glass breaks, do not touch or attempt to remove it. Stop using your product until the glass is replaced by trained service personnel.

---

## Chapter 1. Product overview

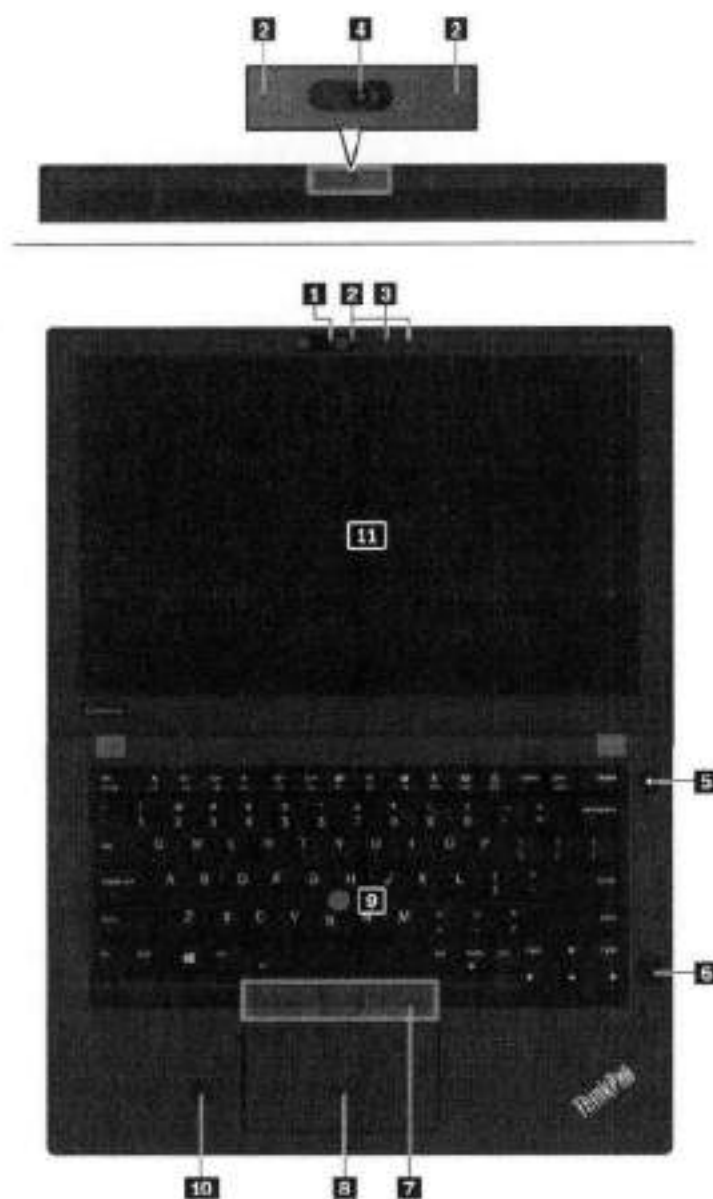
This chapter provides basic information to help you get familiar with your computer.

---

### Computer controls, connectors, and indicators

This section introduces hardware features of the computer.

#### Front view





1 Infrared camera *	2 Microphones
3 Conventional camera *	4 Conventional camera with camera shutter *
5 Power button	6 Fingerprint reader *
7 TrackPoint buttons	8 Trackpad
9 TrackPoint® pointing stick	10 NFC mark*
11 Screen (multi-touch screen on some models)	

**Note:** \* Available on some models.

#### 1 Infrared camera

The infrared camera provides a personal and secure way for you to sign in to your computer with face authentication. After setting the infrared camera for face authentication, you can unlock your computer by scanning your face instead of using a password. For more information, see "Using the cameras" on page 31.

**Note:** The infrared camera is supported only on the Windows 10 operating system.

#### 2 Microphones

The microphones capture sound and voice when used with a program capable of handling audio.

#### 3 Conventional camera

The camera enables you to take pictures or hold a video conference. For more information, see "Using the cameras" on page 31.

#### 4 Conventional camera with camera shutter

The camera enables you to take pictures or hold a video conference. You can use the camera shutter to cover (slide to the right) or unveil (slide to the left) the camera lens.

#### 5 Power button

Press the power button to turn on the computer or put the computer into sleep mode.

To turn off the computer, open the Start menu, click  **Power**, and then click **Shut down**.

If your computer is unresponsive, you can turn off the computer by pressing and holding the power button for four or more seconds. If the computer cannot be turned off, see "Computer stops responding" on page 78 for more information.

You also can define what the power button does. For example, by pressing the power button, you can turn off the computer or put the computer into sleep or hibernation mode. To change what the power button does, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options → Choose what the power buttons do**.
3. Follow the instructions on the screen.

#### 6 Fingerprint reader

Fingerprint authentication provides simple and secure user access by associating your fingerprint with a password. For more information, see "Using the fingerprint reader" on page 54.

### ThinkPad pointing device

- TrackPoint buttons
- Trackpad
- TrackPoint pointing stick

Your computer is equipped with the Lenovo-unique ThinkPad® pointing device. For more information, see "ThinkPad pointing device overview" on page 20.

### ■ NFC mark

Near field communication (NFC) is a high-frequency and short-range wireless communication technology. By using NFC, you can establish the radio communications between your computer and another NFC-enabled device over a few centimeters or inches. For more information, see "Using the NFC devices" on page 28.

### ■ Screen (multi-touch screen on some models)

The multi-touch screen enables you to use your computer with simple touch gestures. For more information, see "Using the multi-touch screen" on page 16.

## Left-side view



1 USB-C™ connector	2 USB-C connector (Thunderbolt™ 3 compatible)
2 Docking-station connector	4 Fan louvers
3 Smart-card slot *	

**Note:** \* Available on some models.

### ■ USB-C™ connector

The USB-C connector / power connector on your computer supports both the USB Type-C™ standard. With an appropriate USB-C cable connected, you can use the connector to transfer data, charge your device, or connect your computer to external displays.

The USB-C connector also works as the power connector. Use the shipped USB-C power adapter and power cord to connect the computer to ac power through the USB-C connector.

Lenovo provides various USB-C accessories to help you expand your computer functionality. For more information, go to:

<http://www.lenovo.com/essentials>

**Note:** When the battery power is below 10%, the USB-C accessories connected to the USB-C connector might not work correctly.

### ■ USB-C connector (Thunderbolt™ 3 compatible)

The USB-C connector on your computer supports both the USB Type-C standard and the Thunderbolt 3 technology. With an appropriate USB-C cable connected, you can use the connector to transfer data, charge your device, or connect your computer to external displays.

The USB-C connector also works as the power connector. Use the shipped USB-C power adapter and power cord to connect the computer to ac power through the USB-C connector.

Lenovo provides various USB-C accessories to help you expand your computer functionality. For more information, go to:

<http://www.lenovo.com/essentials>

**Note:** When the battery power is below 10%, the USB-C accessories connected to the USB-C connector might not work correctly.

#### **1 Docking-station connector**

Connect your computer to a supported docking station to extend the computer capabilities. For more information, see "Attaching your computer to a docking station" on page 39.

#### **2 Fan louvers**

The fan louvers and internal fan enable air to circulate in the computer to ensure proper cooling, especially the cooling of the microprocessor.

**Note:** To ensure proper airflow, do not place any obstacles in front of the fan louvers.

#### **3 Smart-card slot**

Use smart cards for authentication, data storage, and application processing. Within large organizations, you might also use smart cards for strong security authentication of single sign-on (SSO). For more information, see "Using a media card or a smart card" on page 32.

## Right-side view



<b>1</b> Audio connector	<b>2</b> USB 3.1 connector Gen 1
<b>3</b> HDMI™ connector	<b>4</b> Always On USB 3.1 connector Gen 1
<b>5</b> Ethernet connector	<b>6</b> Media-card slot
<b>7</b> Security-lock slot	

#### **1 Audio connector**

Connect headphones or a headset with a 3.5-mm (0.14-inch), 4-pole plug to the audio connector to listen to the sound from the computer.

If you are using a headset with a function switch, do not press this switch while using the headset. If you press the switch, the headset microphone is disabled, and the integrated microphones on the computer is enabled instead.

**Note:** The audio connector does not support a conventional microphone. For more information, see "Using audio features" on page 30.

#### **2 USB 3.1 connector Gen 1**

Connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.

**Attention:** When you attach a USB cable to this connector, ensure that the USB mark is facing upward. Otherwise the connector might get damaged.

### **■ HDMI connector**

The High-Definition Multimedia Interface (HDMI) connector is a digital audio and video interface. It enables you to connect your computer to a compatible digital audio device or video monitor, such as a high-definition television (HDTV).

### **■ Always on USB 3.1 connector Gen 1**

Connect USB-compatible devices and charge some mobile digital devices and smartphones when your computer is in sleep or hibernation mode.

### **■ Ethernet connector**

Connect the computer to a local area network (LAN). The Ethernet connector has two network status indicators. When the green indicator is on, the computer is connected to a LAN. When the yellow indicator blinks, data is being transmitted.



**To avoid the risk of electrical shock, do not connect the telephone cable to the Ethernet connector. You can only connect an Ethernet cable to this connector.**

**Note:** If the computer is connected to a docking station, use the Ethernet connector on the docking station instead of the one on the computer.

### **■ Media-card slot**

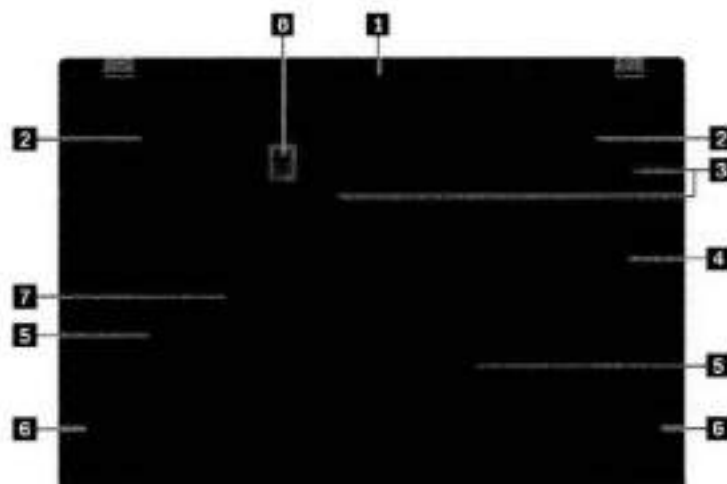
Insert a flash media card into the media-card slot for data access or storage. For more information, see "Using a media card or a smart card" on page 32.

### **■ Security-lock slot**

Lock your computer to a desk, table, or other fixtures through a security cable lock that fits this security-lock slot to protect your computer from theft.

**Note:** You are responsible for evaluating, selecting, and implementing the locking device and security feature. Lenovo makes no comments, judgments, or warranties about the function, quality, or performance of the locking device and security feature.

## **Bottom view**



<b>1</b> Removable battery	<b>2</b> Latches
<b>3</b> Docking-station hook holes	<b>4</b> Fan louvers
<b>5</b> Keyboard drainage holes	<b>6</b> Speakers
<b>7</b> Emergency-reset hole	<b>8</b> Nano-SIM card slot *

**Note:** \* Available on some models.

#### **1 Removable battery**

You can use the computer with battery power whenever ac power is unavailable.

#### **2 Latches**

Use the latches to lock or unlock the removable battery.

#### **3 Docking-station hook holes**

Use the docking-station hook holes to secure a supported docking station.

#### **4 Fan louvers**

The fan louvers and internal fan enable air to circulate in the computer to ensure proper cooling, especially the cooling of the microprocessor.

**Note:** To ensure proper airflow, do not place any obstacles under the fan louvers.

#### **5 Keyboard drainage holes**

If you accidentally spill water or drink over the keyboard, the keyboard drainage holes can help drain out liquid from your computer.

#### **6 Speakers**

Your computer is equipped with a pair of stereo speakers.

#### **7 Emergency-reset hole**

If the computer stops responding and you cannot turn it off by pressing the power button, remove the ac power adapter. Then, insert a straightened paper clip into the emergency-reset hole to reset the computer.

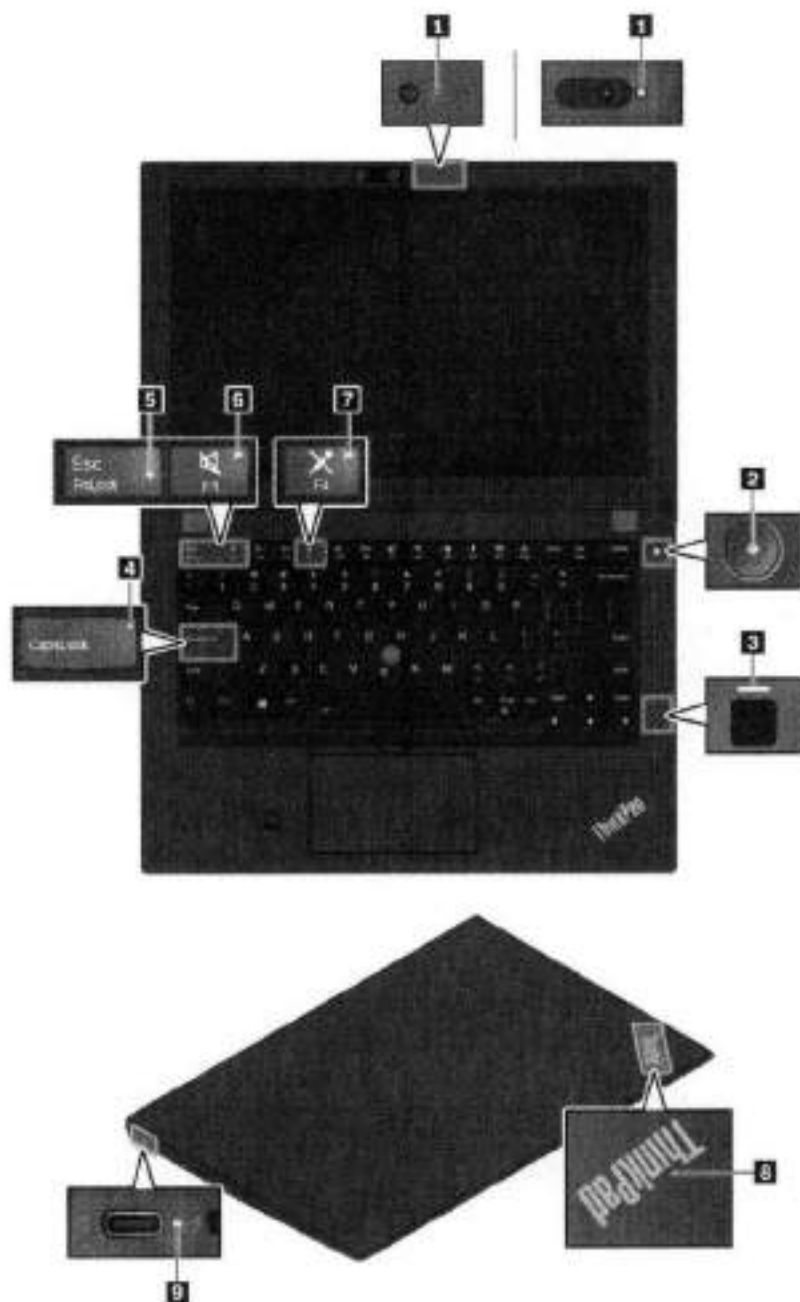
#### **8 Nano-SIM card slot**

The nano-SIM-card slot is in the battery compartment. If the computer supports the wireless wide area network (WWAN), a nano Subscriber Identification Module (SIM) card might be required to establish connections. For information about replacing or installing the nano-SIM card, see "Replacing the nano-SIM card" on page 100.

## Status indicators

This topic provides information about locating and identifying the various status indicators on your computer.

**Note:** Depending on the model, your computer might look different from the following illustrations.



#### **1** Camera status indicator

When this indicator is on, the camera is in use.

#### **2 3** System status indicators

The indicator in the ThinkPad logo on the computer lid and the indicator in the power button show the system status of your computer.

- **Blinks for three times:** The computer is initially connected to power.
- **On:** The computer is on (in normal mode).
- **Off:** The computer is off or in hibernation mode.

- **Blinks quickly:** The computer is entering sleep or hibernation mode.
- **Blinks slowly:** The computer is in sleep mode.

#### **Fingerprint reader indicator**

This indicator shows the status of fingerprint reader. For more information, see "Using the fingerprint reader" on page 54.

#### **Caps Lock indicator**

When this indicator is on, you can type uppercase letters by directly pressing the letter keys.

#### **Fn Lock indicator**

This indicator shows the status of Fn Lock function. For more information, see "Using the special keys" on page 18.

#### **Speaker-mute indicator**

When this indicator is on, the speakers are muted.

#### **Microphone-mute indicator**

When this indicator is on, the microphones are muted.

#### **ac power status indicator**

This indicator shows the ac power and charging status of the computer.

- **White:** connected to ac power (battery power 90%–100%)
- **Amber:** connected to ac power (battery power 0%–90%)
- **Off:** not connected to ac power

---

## **Important product information**

This section provides information to help you locate the following:

- Machine type and model information
- FCC ID and IC Certification information
- Windows operating systems information

### **Machine type and model information**

When you contact Lenovo for help, the machine type and model information helps the technicians to identify your computer and provide faster service.

The following illustration shows where to find the machine type and model information of your computer.



## FCC ID and IC Certification number

The FCC and IC Certification information is identified by a label on the computer as shown in the following illustration.

**Note:** Depending on the model, your computer might look different from the following illustration.




The content of this label differs depending on the wireless modules that come with your computer:

- For a preinstalled wireless module, this label identifies the actual FCC ID and IC certification number for the wireless module installed by Lenovo.

**Note:** Do not remove or replace a preinstalled wireless module by yourself. For replacement, you must contact Lenovo service first. Lenovo is not responsible for any damage caused by unauthorized replacement.

- For a user-installable wireless WAN module, this label directs you to consult this user guide for the actual FCC ID and IC certification number.

The FCC ID and IC Certification number label is affixed to the wireless WAN module  (available on some models) installed in the computer.





**Note:** For the user-installable wireless module, ensure that you use only Lenovo-authorized wireless module for the computer. Otherwise, an error message will be displayed and the computer will beep when you turn on the computer.

## Labels for the Windows operating systems

**Windows® 10 Genuine Microsoft® label:** Your computer might have a Genuine Microsoft label affixed to its cover depending on the following factors:

- Your geographic location
- Date when your computer was manufactured
- Version of Windows 10 that is preinstalled

Go to <https://www.microsoft.com/en-us/howtotell/Hardware.aspx> for illustrations of the various types of Genuine Microsoft labels.

- In the People's Republic of China, the Genuine Microsoft label is required on all computer models preinstalled with any version of Windows 10.
- In other countries and regions, the Genuine Microsoft label is required only on computer models licensed for Windows 10 Pro.

The absence of a Genuine Microsoft label does not indicate that the preinstalled Windows version is not genuine. For details on how to tell whether your preinstalled Windows product is genuine, refer to the information provided by Microsoft at:

<https://www.microsoft.com/en-us/howtotell/default.aspx>

There are no external, visual indicators of the Product ID or Windows version for which the computer is licensed. Instead, the Product ID is recorded in the computer firmware. Whenever a Windows 10 product is installed, the installation program checks the computer firmware for a valid, matching Product ID to complete the activation.

In some cases, an earlier Windows version might be preinstalled under the terms of the Windows 10 Pro license downgrade rights.

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## Computer features

The computer features introduced in this topic cover various models. Some computer features might be available only on specific models.

### Microprocessor

To view the microprocessor information of your computer, right-click the **Start** button and then select **System**.

### Memory

Double data rate 4 (DDR4) small outline dual in-line memory module (SODIMM)

### Storage device

- 2.5-inch form factor, 7-mm (0.28-inch) height hard disk drive \*
- 2.5-inch form factor, 7-mm (0.28-inch) height Serial Advanced Technology Attachment (SATA) solid-state drive \*
- M.2 solid-state drive \*

### Display

- Brightness control
- Color display with In-Plane Switching (IPS) or Twisted Nematic (TN) technology
- Display size: 355.6 mm (14 inches)
- Display resolution: 1366 x 768 pixels, 1920 x 1080 pixels, or 2560 x 1440 pixels
- Multi-touch technology \*

### Keyboard

- Six-row keyboard (backlight function available on some models)
- Function keys
- ThinkPad pointing device

### Connectors and slots

- Audio connector
- Ethernet connector
- HDMI connector
- Media-card slot
- Two USB-C connectors (one Thunderbolt 3 compatible)
- Two USB 3.1 connectors Gen 1 (including one Always On USB connector)
- Smart-card slot \*
- Nano-SIM-card slot (inside the battery compartment) \*

### Security features

- Security-lock slot
- Security chip
- Face authentication (available on models with the infrared camera)
- Fingerprint reader \*

- Trusted Platform Module (TPM) \*
- Conventional camera with camera shutter \*

**Wireless features**

- Bluetooth
- Wireless LAN
- Global Positioning System (GPS) \*
- NFC \*
- Wireless WAN \*

**Others**

- Microphones
- Conventional camera \*

**Note:** \* Available on some models.

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**Computer specifications****Size**

- Width: 336.6 mm (13.25 inches)
- Depth: 232.5 mm (9.15 inches)
- Thickness: 19.95 mm (0.79 inches)

**Maximum heat output (depending on the model)**

- 45 W (154 Btu/hr)
- 65 W (222 Btu/hr)

**Power source (ac power adapter)**

- Sine-wave input at 50 Hz to 60 Hz
- Input rating of the ac power adapter: 100 V to 240 V ac, 50 Hz to 60 Hz

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**Operating environment****Maximum altitude (without pressurization)**

- 3048 m (10 000 ft)

**Temperature**

- At altitudes up to 2438 m (8000 ft)
  - Operating: 5°C to 35°C (41°F to 95°F)
  - Storage: 5°C to 43°C (41°F to 109°F)
- At altitudes above 2438 m (8000 ft)
  - Maximum temperature when operating under the unpressurized condition: 31.3°C (88°F)

**Note:** When you charge the battery, its temperature must be at least 10°C (50°F).

**Relative humidity**

- Operating: 8% to 95% at wet-bulb temperature 23°C (73°F)
- Storage: 5% to 95% at wet-bulb temperature 27°C (81°F)

If possible, place your computer in a well-ventilated and dry area without direct exposure to sunshine.

**Attention:**

- Keep electrical appliances such as electric fans, radio, air conditioners, and microwave ovens away from the computer. The strong magnetic fields generated by these appliances can damage the monitor and data on the internal storage drive.
- Do not place any beverages on top of or beside the computer or other attached devices. If liquid is spilled on or in the computer or an attached device, a short circuit or other damage might occur.
- Do not eat or smoke over your keyboard. Particles that fall into your keyboard can cause damage.

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**Lenovo programs**

Your computer comes with Lenovo programs to help you work easily and securely.

**Accessing Lenovo programs**

To access Lenovo programs on your computer, do the following:

1. Open the Start menu and locate a program by the program name.
2. If you do not find the program in the program list, search for the program in the search box.

**An introduction to Lenovo programs**

This topic provides a brief introduction to Lenovo programs. Depending on your computer model, some of the programs might not be available.

The available programs are subject to change without notice. To learn more about the programs and other computing solutions offered by Lenovo, go to:

<http://www.lenovo.com/support>

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<b>Hotkey Features Integration</b>	Hotkey Features Integration is a utility package that enables you to select and install utilities specifically for the special keys and buttons on your computer. The special keys and buttons are designed to meet accessibility and usability requirements. Installing related utilities enables full functionality of the special keys and buttons.
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<b>Lenovo Companion</b>	Your computer's best features and capabilities should be easy to access and understand. With Lenovo Companion, they are.
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Use Lenovo Companion to do the following:

- Optimize your computer performance, monitor your computer health, and manage updates.
- Access your user guide, check warranty status, and view accessories customized for your computer.
- Read how-to articles, explore Lenovo forums, and stay up-to-date on technology news with articles and blogs from trusted sources.
- Configure hardware settings.
- Create and manage your Lenovo ID.

This app is filled with exclusive Lenovo content to help you learn more about what you can do with your Lenovo computer.

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## Chapter 2. Using your computer

This chapter provides information to help you use the various features provided by your computer.

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### Registering your computer

When you register your computer, information is entered into a database, which enables Lenovo to contact you if there is a recall or other severe problem. In addition, some locations offer extended privileges and services to registered users.

When you register your computer with Lenovo, you also will receive the following benefits:

- Quicker service when you call Lenovo for help
- Automatic notification of free software and special promotional offers

To register your computer with Lenovo, go to <http://www.lenovo.com/register> and follow the instructions on the screen.

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### Frequently asked questions

This topic provides a few tips to help you optimize the use of your ThinkPad notebook computers.

To ensure the best computer performance, go to the following Web site to find information such as aids for troubleshooting and answers to frequently asked questions:

<http://www.lenovo.com/support/faq>

#### Can I get my user guide in another language?

To download the user guide in another language, go to <http://www.lenovo.com/support>. Then follow the instructions on the screen.

#### How do I get help about the Windows operating system?

The Windows help information system provides you with detailed information about using the Windows operating system so that you can get the most of your computer. To access the Windows help information system, click the **Start** button to open the Start menu, and then click **Get Help**. Additionally, you can use the Cortana® personal assistant to search for help, apps, files, settings, and so on.

#### How do I access Control Panel?

Click the **Start** button to open the Start menu, and then click **Windows System → Control Panel**.

#### How to turn off my computer?

Open the Start menu, click **Power**, and then click **Shut down**.

#### How to partition my storage drive?

To partition the storage drive of your computer in the Windows operating system, refer to <https://support.lenovo.com/solutions/ht503851>.

#### How do I use battery power more effectively when I am on the go?

- To conserve power, or to suspend operation without exiting programs or saving files, see "Power-saving modes" on page 26.

- To achieve the best balance between performance and power saving, create and apply an appropriate power plan. See "Managing the battery power" on page 26.
- If your computer will be turned off for an extended period of time, you can prevent battery power from draining by removing the battery.

#### **How do I securely dispose of data stored on the internal storage drive?**

- Study Chapter 5 "Security" on page 51 to find out how you can protect your computer from theft and unauthorized use.
- Before you dispose of the data on the internal storage drive, ensure that you read "Deleting data from your storage drive" on page 56.

#### **How do I attach an external display?**

- Refer to "Using an external display" on page 33.
- With the Extend desktop function, you can display output on both the computer display and an external display.

#### **How do I attach or replace a device?**

Refer to the appropriate topic in Chapter 9 "Replacing devices" on page 97.

#### **I have been using the computer for some time already, and is getting slower. What should I do?**

- Follow the "General tips for preventing problems" on page 77.
- Diagnose problems yourself by using the preinstalled diagnostic software. See "Diagnosing problems with Lenovo Companion" on page 77.
- Check for recovery solutions in Chapter 8 "Recovery information" on page 85.

**Print the following topics and keep them with your computer in case you are unable to access this electronic user guide when necessary.**

- "Installing the Windows 10 operating system" on page 59
- "Computer stops responding" on page 78
- "Power problems" on page 90

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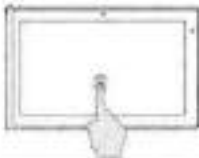


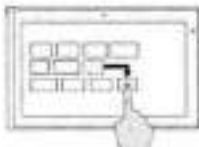
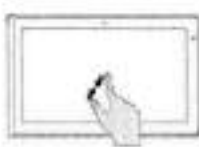
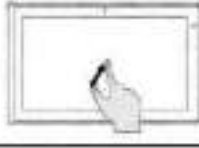


## **Using the multi-touch screen**

This topic provides instructions on how to use the multi-touch screen that is available on some models.



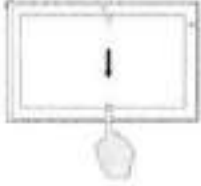
#### **Notes:**

- Your computer screen might look different from the following illustrations.
- Depending on the program you use, some gestures might not be available.

The following table introduces some frequently used gestures.

Touch gesture (touch models only)	Description
	<p><b>Touch:</b> Tap.</p> <p><b>Mouse action:</b> Click.</p> <p><b>Function:</b> Open an app or perform an action on an open app, such as <b>Copy</b>, <b>Save</b>, and <b>Delete</b>, depending on the app.</p>
	<p><b>Touch:</b> Tap and hold.</p> <p><b>Mouse action:</b> Right-click.</p> <p><b>Function:</b> Open a menu with multiple options.</p>
	<p><b>Touch:</b> Slide.</p> <p><b>Mouse action:</b> Scroll the mouse wheel, move the scroll bar, or click the scroll arrow.</p> <p><b>Function:</b> Scroll through items, such as lists, pages, and photos.</p>
	<p><b>Touch:</b> Drag an item to the location you want.</p> <p><b>Mouse action:</b> Click, hold, and drag an item.</p> <p><b>Function:</b> Move an object.</p>
	<p><b>Touch:</b> Move two fingers closer together.</p> <p><b>Mouse action:</b> Press the Ctrl key while scrolling the mouse wheel backward.</p> <p><b>Function:</b> Zoom out.</p>
	<p><b>Touch:</b> Move two fingers farther apart.</p> <p><b>Mouse action:</b> Press the Ctrl key while scrolling the mouse wheel forward.</p> <p><b>Function:</b> Zoom in.</p>
	<p><b>Touch:</b> Swipe in from the right edge.</p> <p><b>Mouse action:</b> Click the action center icon  in the Windows notification area.</p> <p><b>Function:</b> Open the action center to see your notifications and quick actions.</p>



Touch gesture (touch models only)	Description
	<p><b>Touch:</b> Swipe in from the left edge.</p> <p><b>Mouse action:</b> Click the task-view icon  on the taskbar.</p> <p><b>Function:</b> View all your open windows in task view.</p>
	<ul style="list-style-type: none"> <li> <p><b>Short swipe for full-screened app or when your computer is in the tablet mode</b></p> <p><b>Touch:</b> Swipe downwards shortly from the top edge.</p> <p><b>Mouse action:</b> Move your pointer to the top edge of the screen.</p> <p><b>Function:</b> Show a hidden title bar.</p> </li> <li> <p><b>Long swipe when your computer is in the tablet mode</b></p> <p><b>Touch:</b> Swipe in from the top edge to the bottom edge.</p> <p><b>Mouse action:</b> From the top edge of the screen, click and hold, move the pointer to the bottom of the screen, and then release.</p> <p><b>Function:</b> Close the current app.</p> </li> </ul>

#### Tips on using the multi-touch screen

- The multi-touch screen is a glass panel covered with a plastic film. Do not apply pressure or place any metallic object on the screen, which might damage the touch panel or cause it to malfunction.
- Do not use fingernails, gloved fingers, or inanimate objects for input on the screen.
- Regularly calibrate the accuracy of the finger input to avoid a discrepancy.

#### Tips on cleaning the multi-touch screen

- Turn off the computer before cleaning the multi-touch screen.
- Use a dry, soft, and lint-free cloth or a piece of absorbent cotton to remove fingerprints or dust from the multi-touch screen. Do not apply solvents to the cloth.
- Gently wipe the screen using a top-down motion. Do not apply any pressure on the screen.

## Using the special keys

Your computer has several special keys to help you work more easily and effectively.




















## ■ Windows logo key

Press the Windows logo key to open the Start menu. For information about using the Windows logo key with other keys, see the help information system of the Windows operating system.

## ■ ■ Fn key and function keys

You can configure the Fn key and function keys in the Keyboard Properties window by doing the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Lenovo - Keyboard Manager** and the Keyboard Manager window is displayed.
3. Select the options of your preference.

-  +  Switch the key function between the standard F1–F12 function and the special function printed as an icon on each key. When the Fn Lock indicator is off, you can use the default function. You can change the default function in the Keyboard Properties window.
-  Mute or unmute the speakers. When the speakers are muted, the indicator on the key is on. If you mute the sound and turn off your computer, the sound will remain muted when you turn on your computer. To turn on the sound, press  or .
-  Decrease the speaker volume.
-  Increase the speaker volume.
-  Mute or unmute the microphones. When the microphones are muted, the indicator on the key is on.
-  Darken the computer display.
-  Brighten the computer display.
-  Manage external displays.
-  Enable or disable the built-in wireless features.
-  Open the Settings window.
-  Enable or disable the built-in Bluetooth features.
-  Open a keyboard setting page.
-  Invoke the function defined by yourself. If no function is defined, press this key to open the Cortana personal assistant. To define or change the function, do the following:
  1. Open the Start menu and click the Lenovo Companion program.
  2. Click **Hardware Settings** and then click the input icon .
  3. Locate the **Keyboard: User-defined Key** section and follow the instructions on the screen to complete the setting.

On the **Input** page, you can also define different functions for the key combinations with F12, such as Shift+F12, Alt+F12, or Ctrl+F12.

## Key combinations

-  +  Open the Snipping Tool program.

- **Fn+B:** The Break key
- **Fn+K:** The ScrLK or Scroll Lock key
- **Fn+P:** The Pause key
- **Fn+S:** The SysRq key
- **Fn+Left Arrow key:** The Home key
- **Fn+Right Arrow key:** The End key
- **Fn+4:** Put the computer into sleep mode. To wake up the computer, press the Fn key or the power button.
- **Fn+Spacebar:** If your computer supports keyboard backlight, press Fn+Spacebar to switch between the different keyboard backlight status.

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## Using the ThinkPad pointing device

This section provides information about using the ThinkPad pointing device.

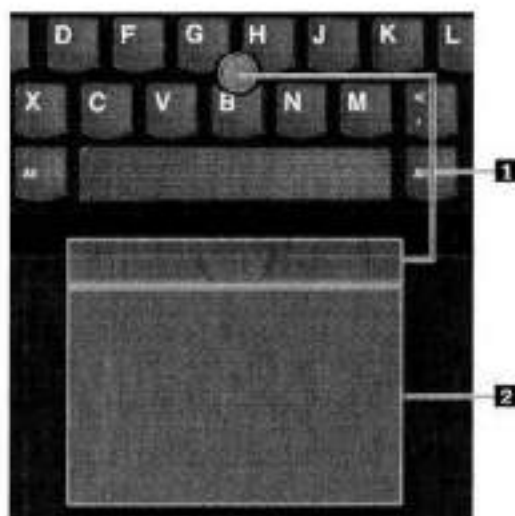
### ThinkPad pointing device overview

The ThinkPad pointing device enables you to perform all the functions of a traditional mouse, such as pointing, clicking, and scrolling. With the ThinkPad pointing device, you also can perform various touch gestures, such as rotating and zooming in or out.

The ThinkPad pointing device consists of the following devices:

- TrackPoint pointing device
- Trackpad

**Note:** Depending on the model, your TrackPoint pointing device and the trackpad might look different from the illustration in this topic.



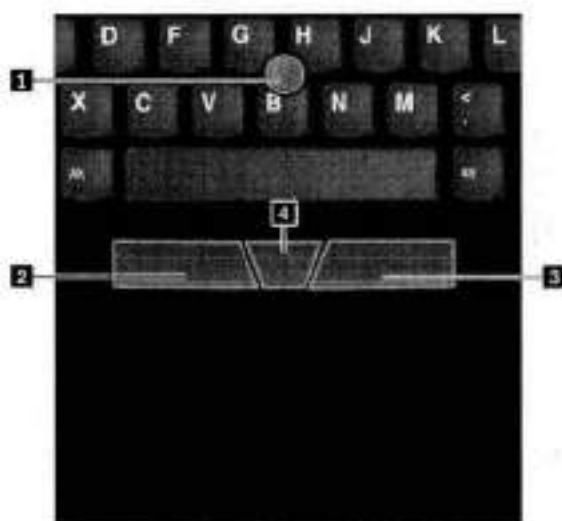
By default, both the TrackPoint pointing device and the trackpad are active with the touch gestures enabled. To change the settings, see "Customizing the ThinkPad pointing device" on page 23.

## Using the TrackPoint pointing device

The TrackPoint pointing device enables you to perform all the functions of a traditional mouse, such as pointing, clicking, and scrolling.

The TrackPoint pointing device consists of the following components:

- ❶ Pointing stick
- ❷ Left-click button (primary-click button)
- ❸ Right-click button (secondary-click button)
- ❹ Scroll bar



To use the TrackPoint pointing device, see the following instructions:

**Note:** Place your hands in the typing position and use your index finger or middle finger to apply pressure to the pointing-stick nonslip cap. Use either thumb to press the left-click button or right-click button.

- **Point**

Use the pointing stick ❶ to move the pointer on the screen. To use the pointing stick, apply pressure to the pointing-stick nonslip cap in any direction parallel to the keyboard. The pointer moves accordingly but the pointing stick itself does not move. The speed at which the pointer moves depends on the amount of pressure you apply to the pointing stick.

- **Left-click**

Press the left-click button ❷ to select or open an item.

- **Right-click**

Press the right-click button ❸ to display a shortcut menu.

- **Scroll**

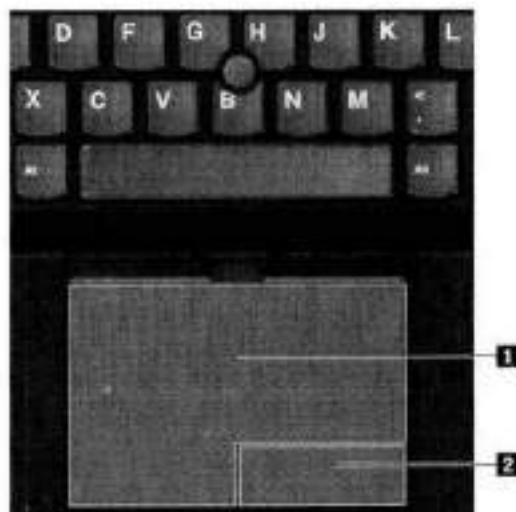
Press and hold the dotted scroll bar ❹ while applying pressure to the pointing stick in the vertical or horizontal direction. Then you can scroll through the document, Web site, or apps.

## Using the trackpad

The entire trackpad surface is sensitive to finger touch and movement. You can use the trackpad to perform all the pointing, clicking, and scrolling functions of a traditional mouse.

The trackpad can be divided into two zones:

- 1 Left-click zone (primary-click zone)
- 2 Right-click zone (secondary-click zone)



To use the trackpad, see the following instructions:

- **Point**  
Slide one finger across the surface of the trackpad to move the pointer accordingly.
- **Left-click**  
Press the left-click zone 1 to select or open an item.  
You also can tap anywhere on the surface of the trackpad with one finger to perform the left-click action.
- **Right-click**  
Press the right-click zone 2 to display a shortcut menu.  
You also can tap anywhere on the surface of the trackpad with two fingers to perform the right-click action.
- **Scroll**  
Put two fingers on the trackpad and move them in the vertical or horizontal direction. This action enables you to scroll through the document, Web site, or apps. Ensure that you position your two fingers slightly apart from each other.

With the trackpad, you also can perform a variety of touch gestures. For information about using the touch gestures, see "Using the trackpad touch gestures" on page 23.

If the trackpad surface is stained with oil, turn off the computer first. Then gently wipe the trackpad surface with a soft and lint-free cloth moistened with lukewarm water or computer cleaner.

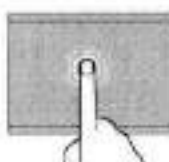
## Using the trackpad touch gestures

The entire trackpad surface is sensitive to finger touch and movement. You can use the trackpad to perform the same point and click actions as you would use a traditional mouse. You also can use the trackpad to perform various touch gestures.

The following section introduces some frequently used touch gestures such as tapping, dragging, and scrolling. For more gestures, see the help information system of the ThinkPad pointing device.

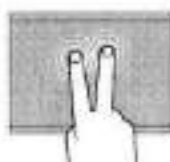
### Notes:

- When using two or more fingers, ensure that you position your fingers slightly apart.
- Some gestures are not available if the last action was done from the TrackPoint pointing device.
- Some gestures are only available when you are using certain apps.
- Depending on the model, the trackpad on your computer might look different from the illustrations in this topic.



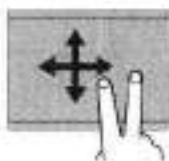
#### Tap

Tap anywhere on the trackpad with one finger to select or open an item.



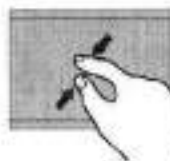
#### Two-finger tap

Tap anywhere on the trackpad with two fingers to display a shortcut menu.



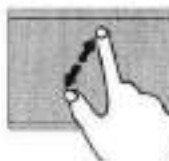
#### Two-finger scroll

Put two fingers on the trackpad and move them in the vertical or horizontal direction. This action enables you to scroll through the document, Web site, or apps.



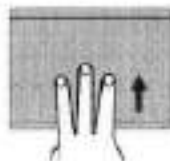
#### Two-finger zoom out

Put two fingers on the trackpad and move them closer together to zoom out.



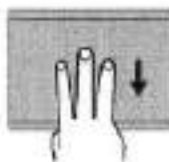
#### Two-finger zoom in

Put two fingers on the trackpad and move them farther apart to zoom in.



#### Swipe three fingers up

Put three fingers on the trackpad and move them up to open the task view to see all your open windows.



#### Swipe three fingers down

Put three fingers on the trackpad and move them down to show the desktop.

## Customizing the ThinkPad pointing device

You can customize the ThinkPad pointing device so you can use it more comfortably and efficiently. For example, you can choose to enable the TrackPoint pointing device, the trackpad, or both. You also can disable or enable the touch gestures.

To customize the ThinkPad pointing device, do the following:

1. Go to Control Panel.
2. View Control Panel by Large icons or Small icons. Click **Mouse**. The Mouse Properties window is displayed.
3. In the Mouse Properties window, follow the instructions on the screen to complete the customization.



## Using the battery

When you use your computer away from electrical outlets, you depend on battery power to keep your computer running. Different computer components consume power at different rates. The more you use the power-intensive components, the faster you consume battery power.

Spend more time unplugged with ThinkPad batteries. Mobility has revolutionized business by enabling you to take your work wherever you go. With ThinkPad batteries, you are able to work longer without being tied to an electrical outlet.

### Checking the battery status

Move your pointer to the battery-status icon in the Windows notification area to check the battery status. The battery-status icon displays the percentage of battery power remaining and how long you can use your computer before you must charge the battery.

The rate at which you use battery power determines how long you can use the battery of your computer between charges. Because every computer user has individual habits and needs, it is difficult to predict how long a battery charge lasts. There are two main factors:

- How much energy is stored in the battery when you begin to work
- The way you use your computer, for example:
  - How often you access the storage drive
  - How bright you make the computer display
  - How often you use the wireless feature

### Charging the battery

When you find that the remaining battery power is low, charge your battery or replace the battery with a charged battery.

If an ac outlet is convenient, connect the computer to ac power. The battery is fully charged in about four to eight hours. The actual charging time depends on the battery size, the physical environment, and whether you are using the computer. You can check the battery charging status at any time through the battery-status icon in the Windows notification area.

**Note:** To maximize the life of the battery, the computer does not start recharging the battery if the remaining power is greater than 95%.

### Tips on charging the battery

- Before you charge the battery, ensure that the battery temperature is higher than 10°C (50°F) and lower than 35°C (95°F).
- Charge the battery in any of the following conditions:
  - A new battery is installed.
  - The percentage of power remaining is low.
  - The battery has not been used for a long time.

### Maximizing the battery life

To maximize the life of the battery, do the following:

- Use the battery until the charge is depleted.
- Recharge the battery completely before using it. You can see whether the battery is fully charged from the battery-status icon in the Windows notification area.



- Always use power management features such as power-saving modes.

## Managing the battery power

To achieve the best balance between performance and power saving, adjust your power plan settings. To adjust power plan settings, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options**.
3. Follow the instructions on the screen.


For more information, see the Windows help information system.

## Power-saving modes

There are several modes that you can use at any time to conserve power. This section introduces each mode and gives tips on the effective use of battery power.

### • Sleep mode

In sleep mode, your work is saved to memory, and then the storage drive and the computer display are turned off. When your computer wakes up, your work is restored within seconds.

To put your computer to sleep mode, open the Start menu, click  **Power**, and then click **Sleep**.

### • Hibernation mode

By using this mode, you can turn off your computer completely without saving files or exiting any programs that are running. When the computer enters hibernation mode, all open programs, folders, and files are saved to the storage drive, and then the computer turns off.

To put the computer to hibernation mode, define what the power button does first, and then press the power button to put the computer to hibernation mode.

If you put your computer to hibernation mode with the wake-up function disabled, the computer does not consume any power. The wake-up function is disabled by default. If you put your computer to hibernation mode with the wake-up function enabled, the computer consumes a small amount of power.

To enable the wake-up function, do the following:

1. Open Control Panel, view Control Panel by Category, and then click **System and Security**.
2. Click **Administrative Tools**.
3. Double-click **Task Scheduler**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. From the left pane, select the task folder for which you want to enable the wake-up function. The scheduled tasks are displayed.
5. Click a scheduled task, and then click the **Conditions** tab.
6. Under **Power**, select **Wake the computer to run this task**.

### • Wireless off

When you are not using the wireless features, such as Bluetooth or wireless LAN, turn them off to help conserve power.

---

## Cabled Ethernet connections

With an Ethernet cable, you can connect your computer to a local network through the Ethernet connector on your computer.

The Ethernet connector has two network status indicators. When the green indicator is on, the computer is connected to a LAN. When the yellow indicator blinks, data is being transmitted.

**Note:** If the computer is connected to a supported docking station or a supported dock, use the Ethernet connector on the docking station or the dock instead of the one on the computer.



**Your computer has an Ethernet connector. To avoid the risk of electrical shock, do not connect the telephone cable to the Ethernet connector.**

## Wireless connections


Wireless connection is the transfer of data without the use of cables but by means of radio waves only.

### Using the wireless-LAN connection

A wireless local area network (LAN) covers a relatively small geographic area, such as an office building or a house. Devices based on the 802.11 standards can connect to this type of network.

Your computer comes with a built-in wireless network card to help you establish wireless connections and monitor the connection status.

To establish a wireless-LAN connection, do the following:

1. Turn on the wireless feature, press .
2. Click the wireless-network-connection-status icon in the Windows notification area. A list of available wireless networks is displayed.
3. Double-click a network to connect to it. Provide required information if needed.

The computer automatically connects to an available and remembered wireless network when the location changes. If the available wireless network is secured, provide the password as required. For more information, see the Windows help information system.

#### Tips on using the wireless-LAN feature

To achieve the best connection, use the following guidelines:

- Place your computer so that there are as few obstacles as possible between the wireless-LAN access point and the computer.
- Open your computer cover to an angle of slightly more than 90 degrees.

#### Checking the wireless-LAN connection status

You can check the wireless-LAN connection status through the wireless-network-connection-status icon in the Windows notification area. The more bars encompassed, the better the signal is.

### Using the wireless-WAN connection

Wireless wide area network (WAN), which uses cellular networks for data transmission, enables you to establish wireless connections over remote public or private networks. These connections can be maintained over a large geographical area by use of multiple antenna sites or satellite systems maintained by wireless service providers.

Some ThinkPad notebook computers come with a wireless-WAN card installed, which provides some wireless-WAN technologies, such as 1xEV-DO, HSPA, 3G, 4G, GPRS, or LTE. By using the wireless-WAN card, you can establish wireless-WAN connections.

**Note:** The wireless-WAN service is provided by authorized service providers in some countries or regions.

#### Tips for using the wireless-WAN feature

To achieve the best connection, use the following guidelines:

- Keep your computer away from your body.
- Place your computer on a flat surface and open your computer display to an angle of slightly more than 90 degrees.
- Place your computer away from concrete or brick walls that might dampen cellular signals.
- Best reception is available near windows and other locations where cellular phone reception is the strongest.

#### Checking the wireless-WAN connection status

You can check the wireless-WAN connection status through the wireless-network-connection-status icon in the Windows notification area. The more bars encompassed, the better the signal is.


## Using the Bluetooth connection

Bluetooth can connect devices that are within a short distance from one another. Bluetooth is commonly used in the following scenarios:

- Connecting peripheral devices to a computer
- Transferring data between hand-held devices and a personal computer
- Remotely controlling and communicating with devices such as mobile phones


Depending on the model, your computer might support the Bluetooth feature. To transfer data through the Bluetooth feature, do the following:

**Note:** It is not recommended to use the wireless feature (the 802.11 standards) of your computer simultaneously with a Bluetooth option. The data transmission speed can be delayed and the performance of the wireless feature can be degraded.

1. Do one of the following:
  - Press the Bluetooth-control key  and turn on the Bluetooth feature.
  - Open the Start menu, and then click **Settings** → **Devices** → **Bluetooth & other devices**. Turn on the **Bluetooth** switch to enable the Bluetooth feature.
2. Right-click the data that you want to send.
3. Select **Send To** → **Bluetooth Devices**.
4. Select a Bluetooth device, and then follow the instructions on the screen.

For more information, see the Windows help information system and the help information system of the Bluetooth device.

## Using the NFC devices

If your computer supports the near field communication (NFC) feature, you will see an NFC icon or label  around the trackpad area.

NFC is a high-frequency and short-range wireless communication technology. By using NFC, you can establish the radio communications between your computer and another NFC-enabled device over a few centimeters or inches.

This section provides instructions on how to pair your computer with an NFC device. For more information about data transfer, see the documentation of the NFC device.

**Attention:**

- Before handling the NFC card, touch a metal table or a grounded metal object. Otherwise the card might get damaged by the static electricity from your body.
- During the data transfer, do not put your computer or NFC-enabled smartphone to sleep mode; otherwise, your data might get damaged.

**Enabling the NFC feature**

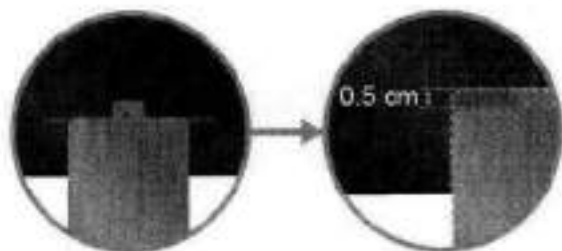
By default, the NFC feature is enabled. If the NFC feature of your computer is disabled, do the following to enable the NFC feature:

1. Open the Start menu and then click **Settings → Network & Internet → Airplane mode**.
2. Turn off the Airplane mode.
3. Turn on the NFC function.

**Pairing your computer with an NFC card**

Before you start, ensure that the card is in NFC Data Exchange Format (NDEF), otherwise the card cannot be detected. Then do the following:

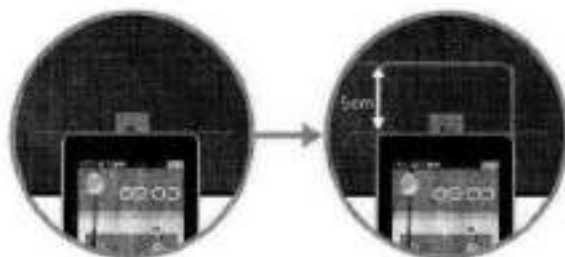
1. Position the card closely above the NFC label as shown. Align the shorter edge of the card with the horizontal extension line for the center of the NFC label.
2. Slowly move the card a distance within 0.5 cm (0.20 inches) to the direction of the computer display. Then hold the card for seconds until you are prompted that the card has been successfully detected.



### Pairing your computer with an NFC-enabled smartphone

Before you start, ensure that the smartphone screen is facing upward. Then do the following:

1. Position the smartphone closely above the NFC label as shown. Align the shorter edge of the smartphone with the horizontal extension line for the center of the NFC label.
2. Slowly move the smartphone a distance within 5 cm (1.97 inches) to the direction of the computer display. Then hold the smartphone for seconds until you are prompted that the smartphone has been successfully detected.



### Using the Airplane mode

The Airplane mode is supported on the Windows 10 operating system. If the Airplane mode is enabled, all wireless features are disabled.

To enable or disable the Airplane mode, do the following:

1. Open the Start menu.
2. Click **Settings** → **Network & Internet** → **Airplane mode**.
3. Slide the control for **Airplane mode** to turn it on or off.

---

### Using audio features

Your computer is equipped with the following items:

- Audio connector, 3.5 mm (0.14 inches) in diameter
- Microphones
- Speakers

Your computer also has an audio chip that enables you to enjoy various multimedia audio features, such as the following:

- Compliant with High Definition Audio
- Playback of MIDI and MP3 files
- Recording and playback of PCM and WAV files
- Recording from various sound sources, such as a headset attached

The following list provides information about supported functions of the audio devices attached to the connectors on your computer or the docking station.

- **Headset with a 3.5-mm (0.14-inch), 4-pole plug:** Headphone and microphone functions
- **Conventional headphone:** Headphone function

**Note:** The conventional microphone is not supported.

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## Using the cameras

Depending on models, your computer might be equipped with a conventional camera with camera shutter or an infrared camera.

### Using the conventional camera with camera shutter

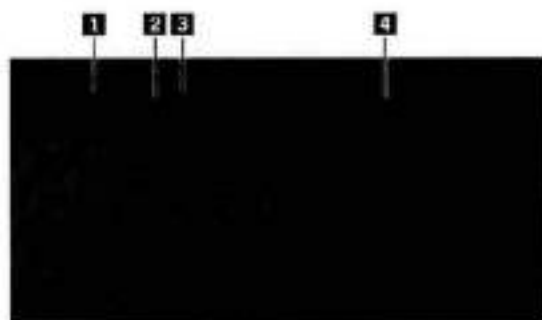
To use the conventional camera to take pictures and record videos, slide the camera shutter to the left to unveil the camera lens first. Then open the Start menu and click **Camera** from the program list. If you use other programs that provide features such as photographing, video capturing, and video conferencing, the camera starts automatically when you enable the camera-required feature. When the camera starts, the camera status indicator nearby turns white, indicating that the camera is in use. If you want to cover the camera lens, slide the camera shutter to the right.

If you want to configure the camera settings, open the Start menu and then click **Lenovo Companion** → **Hardware Settings** → **Display, Camera & Audio/Media**. Locate the **Camera** section and then follow the instructions on the screen to configure the camera settings.

### Using the infrared camera

The infrared camera provides a personal and secure way for you to sign in to your computer with face authentication. After setting the infrared camera for face authentication, you can unlock your computer by scanning your face instead of using a password.

The infrared camera has the following components:



#### 1 Infrared light-emitting diode (LED)

The infrared LED emits infrared light. Normally the infrared light is invisible to the naked eye.

#### 2 Infrared camera lens

The infrared camera lens is used for creating the facial image of a user.

#### 3 Camera indicator

When the camera indicator is on, the infrared camera is in the recognition mode.

To set the infrared camera for face authentication, do the following:

1. Open the Start menu and click **Settings** → **Accounts** → **Sign-in options**.
2. Scroll down to the **Password** section and click **Add** to create a password.
3. Follow the instructions on the screen to create a Personal Identification Number (PIN).
4. Locate the **Windows Hello** section and click **Set up** under **Face Recognition**. Then click **Get Started**.

5. Enter the PIN you have set earlier. The camera preview starts.
6. Follow the instructions on the screen to complete the setup.
7. Click **Improve Recognition** to improve the image so that **Windows Hello** can recognize you in different light conditions or when your appearance changes.

To use the infrared camera to unlock your computer, do the following:

1. On the Windows lock screen, select the smiling face icon from the sign-in options.
2. Follow the instructions on the screen and ensure that you are centered and looking directly at the camera. When the program recognizes your face, it automatically unlocks the screen and signs you in to the Windows operating system.

---

## Using a media card or a smart card

Your computer has a media-card slot. Depending on the model, your computer might also have a smart-card slot.

### Supported media card types

The media-card reader on your computer only supports the following media cards:

**Note:** Your computer does not support the content protection for recordable media (CPRM) feature for the SD card.

- MultiMediaCard (MMC)
- Secure Digital (SD) card
- Secure Digital eXtended-Capacity (SDXC) card
- Secure Digital High-Capacity (SDHC) card

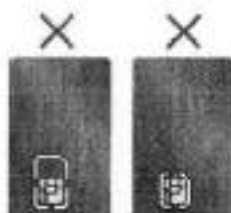
### Supported smart card type

You can use smart cards for authentication, data storage, and application processing. Within large organizations, you might also use smart cards for strong security authentication of single sign-on (SSO). The smart-card reader on your computer only supports the smart card of the following specifications:



- Length: 85.80 mm (3.37 inches)
- Width: 53.98 mm (2.13 inches)
- Thickness: 0.76 mm (0.03 inches)

**Attention:** Smart cards with slits are not supported. Do not insert such a smart card into the smart-card reader of your computer. Otherwise the reader might get damaged.



### Installing a media card or a smart card

**Attention:** Before you start installing a card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. Static electricity could damage the card.

To install the card, do the following:

1. Locate the appropriate type of slot for your card. See "Computer controls, connectors, and indicators" on page 1.
2. Ensure that the card is correctly oriented:
  - For the media card: The metal contacts are facing down and pointing toward the card slot.
  - For the smart card: The metal contacts are facing upward and pointing toward the card slot.
3. Press the card firmly into the card slot.

If the plug-and-play feature is not enabled for the installed media card or smart card, do the following to enable the feature:

1. Go to Control Panel.
2. View Control Panel by Category. Click **Hardware and Sound**.
3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. From the **Action** menu, select **Add legacy hardware**. The Add Hardware Wizard starts.
5. Follow the instructions on the screen.

### Removing a media card or a smart card

#### Attention:

- Before removing a card, stop the card first. Otherwise, data on the card might get corrupted or lost.
- When transferring data to or from a media card or a smart card, do not put your computer to sleep or hibernation mode before the data transfer is completed; otherwise, your data might get damaged.
- Do not remove a card when the computer is in sleep mode or hibernation mode. Otherwise, the system might not respond when you try to resume operation.

To remove a card, do the following:

1. Click the triangular icon in the Windows notification area to show hidden icons. Then, right-click the **Safely Remove Hardware and Eject Media** icon.
2. Select the corresponding item to eject the card from the Windows operating system.
3. Press the card to eject it from your computer.
4. Remove the card and store it safely for future use.

**Note:** If you do not remove the card from your computer after you eject the card from the Windows operating system, the card can no longer be accessed. To access the card, you must remove it first, and then insert it again.

---

## Using an external display

This section provides instructions on how to connect an external display, choose display modes, and change display settings.

You can use an external display such as a projector or a monitor to give presentations or to expand your workspace.



Your computer supports the following video resolution, if the external display also supports that resolution.

- Up to 4096 x 2304 pixels / 60 Hz, with an external display connected to the USB-C connector or the USB-C connector (Thunderbolt 3 compatible)
- Up to 4096 x 2160 pixels / 30 Hz with an external display connected to the HDMI connector

For more information about the external display, see the manuals that come with it.

### Connecting an external display

You can use either a wired display or a wireless display. The wired display can be connected to a video connector such as the HDMI connector and the USB-C connector by a cable. The external display connected to the USB-C connector and the external display connected to the HDMI connector cannot be used simultaneously. The wireless display can be added through the Miracast® function.

#### • Connecting a wired display

**Note:** When you connect an external monitor, a video interface cable with a ferrite core is required.

1. Connect the external display to an appropriate video connector on your computer, such as the HDMI connector or the USB-C connector.
2. Connect the external display to an electrical outlet.
3. Turn on the external display.

If your computer cannot detect the external display, right-click on the desktop, and then click **Screen resolution/Display settings → Detect**.


Do not connect external displays to the USB-C connector **1** and the HDMI connector **2** at the same time. Otherwise, only the external display connected to the USB-C connector **1** will work by default. You can change the priority between the USB-C connector and the HDMI connector from the ThinkPad Setup program. To start the ThinkPad Setup program, see "Configuring ThinkPad Setup" on page 61. For more information, see **Shared Display Priority** in "Config menu" on page 63.



#### • Connecting a wireless display


**Note:** To use a wireless display, ensure that both your computer and the external display support the Miracast feature.

Do one of the following:

- Open the Start menu, and then click **Settings → Devices → Connected devices → Add a device**.
- Click the action center icon  in the Windows notification area. Click **Connect**. Select the wireless display and follow the instructions on the screen.

For more information, see the Windows help information system.

### Choosing a display mode

You can display your desktop and apps on the computer display, the external display, or both. To choose how to display the video output, press the display-mode switching key  and then select a display mode you prefer.

There are four display modes:

- **PC screen only:** Displays the video output only on your computer screen.

**Note:** Depending on the situation, you might see **Disconnect**, **PC screen only**, **Computer only** or **Disconnect projector**.

- **Duplicate:** Displays the same video output on both your computer screen and an external display.
- **Extend:** Extends the video output from your computer display to an external display. You can drag and move items between the two displays.
- **Second screen only:** Shows the video output only on an external display.

**Note:** Depending on the situation, you might see **Projector only** or **Second screen only**.

If you show programs using DirectDraw or Direct3D® in full-screen mode, only the main display shows the video output.

### Changing display settings

You can change the settings for both the computer display and the external display. For example, you can define which one is the main display and which one is the secondary display. You also can change the resolution and orientation.

To change display settings, do the following:

1. Right-click on the desktop and select **Display settings** (Windows 10).
2. Select the display that you want to configure.
3. Change display settings as you want.

**Note:** If you set a higher resolution for the computer display than the external display, only part of the screen can be shown on the external display.

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## Traveling with your computer

This topic provides information to help you work with your computer when you are traveling.

Use the following travel tips to travel more confidently and efficiently with your computer.

- When your computer goes through the x-ray machines at airport security stations, it is important to keep your eyes on the computer at all times to prevent theft.
- Consider bringing an electrical adapter for use on an airplane or automobile.
- If you carry an ac power adapter, detach the ac cord from it to avoid damaging the cord.

### Travel tips on airplanes

If you carry your computer onto an airplane, observe the following tips:

- Be careful about the seat in front of you on airplanes. Angle your computer display so that it does not get caught when the person in front of you leans back.
- When taking off, remember to turn off your computer or put it to hibernation mode.

- If you intend to use your computer or wireless services (such as Internet and Bluetooth), check with the airline for restrictions and availability of services before boarding the airplane. If there are restrictions on the use of computers with wireless features on the airplane, you must abide by those restrictions.

The Airplane mode is supported on the Windows 10 operating system. In the Airplane mode, all wireless features are disabled.

To enable the Airplane mode, do the following:

1. Open the Start menu, and then click **Settings → Network & Internet → Airplane mode**.
2. Slide the **Airplane mode** control to turn it on.

### **Travel accessories**

If you are traveling to another country or region, you might want to consider an appropriate ac power adapter for the country or region to which you are traveling.

To purchase travel accessories, go to:

<http://www.lenovo.com/accessories>

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## Chapter 3. Enhancing your computer

This chapter provides instructions on how to use hardware devices to expand your computer capabilities.

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### Finding ThinkPad options

If you want to expand the capabilities of your computer, Lenovo has a number of hardware accessories and upgrades to meet your needs. Options include memory modules, storage devices, network cards, port replicators or docking stations, batteries, power adapters, keyboards, mice, and more.

To shop at Lenovo, go to:

<http://www.lenovo.com/essentials>

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### ThinkPad Basic Docking Station, ThinkPad Pro Docking Station, and ThinkPad Ultra Docking Station

This section introduces how to use the ThinkPad Basic Docking Station, ThinkPad Pro Docking Station, and ThinkPad Ultra Docking Station.

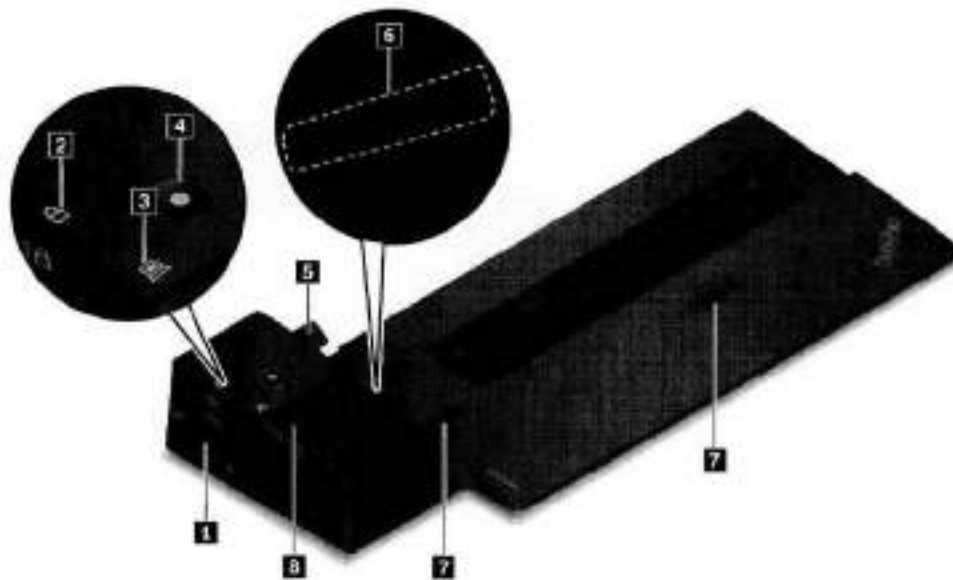
#### Locating controls, connectors, and indicators

This section introduces the locations of controls, connectors, and indicators on the docking stations.

**Note:** When your computer is attached to the docking station, always use the Ethernet connector and the external display connectors on the docking station. Do not use the ones on the computer.

#### Front view

**Note:** The following illustration is based on ThinkPad Basic Docking Station. The ThinkPad Pro Docking Station and ThinkPad Ultra Docking Station might look slightly different.



**1 System lock:** Use the system lock in the following ways:

- When the system lock is in the locked position **1<sup>L</sup>**, the latch is locked, and you cannot attach or detach your computer.
- When the system lock is in the unlocked position **2<sup>U</sup>**, the latch is unlocked, and you can attach or detach your computer.
- When the system lock is in the unlocked position **3<sup>R</sup>**, you can remove the system lock from the system-lock slot.

**Note:** The ThinkPad Basic Docking Station does not ship with a system lock installed. You can purchase a system lock from Lenovo at <http://www.lenovo.com/essentials>.

**2 Key lock indicator:** This indicator turns on when the system lock key is in the locked position.

**3 Docking status indicator:** This indicator turns on when your computer is successfully connected to the docking station.

**4 Power button:** Press the power button to turn on or turn off the computer attached to the docking station.

**5 Guide post:** Use the guide post to help you position your computer properly when you attach the computer to the docking station.

**6 Docking-station connector:** Connect the computer to the docking station.

**7 Hooks:** Hold and secure the computer to the docking station.

**8 Latch:** Slide the latch to attach or detach the computer.

**Rear view**

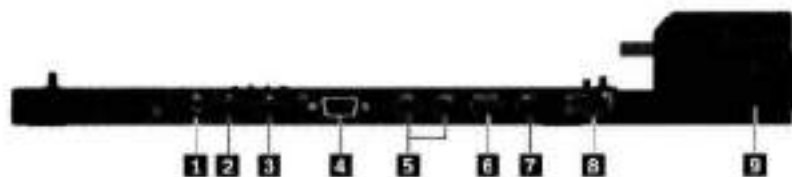


Figure 1. ThinkPad Basic Docking Station



Figure 2. ThinkPad Pro Docking Station

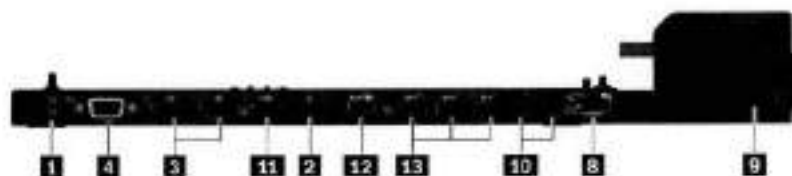


Figure 3. ThinkPad Ultra Docking Station

- **Audio connector:** Connect headphones or a headset with a 3.5-mm (0.14-inch), 4-pole plug.
- **ac power connector:** Connect the ac power adapter.
- **DisplayPort® connector:** Connect a high-performance monitor, a direct-drive monitor, or other devices that use a DisplayPort connector.
- **VGA connector:** Connect the computer to a VGA-compatible video device, such as a VGA monitor.
- **USB 2.0 connector, ■ USB 3.1 connector Gen 1:** Connect USB-compatible devices, such as a USB keyboard, a USB mouse, a USB storage device, or a USB printer.
- **Always On USB 3.1 connector Gen 1, ■ Always on USB 3.1 connector Gen 2:** Connect USB-compatible devices and charge some mobile digital devices and smartphones when your computer is in sleep or hibernation mode.
- **Ethernet connector:** Connect the docking station to an Ethernet LAN.
- **Security-lock slot:** Lock your docking station to a desk, table, or other non-permanent fixture to protect your docking station from theft. Use a security cable lock that fits this security-lock slot.
- **USB-C connector:** Use the connector to transfer data, charge your device, or connect to external displays with an appropriate USB-C cable connected.
- **HDMI connector:** Connect a compatible digital audio device or video monitor, such as a DVD player or an HDTV.
- **USB 3.1 connector Gen 2:** With greater data transfer rate and faster charging speed, the USB 3.1 connector Gen 2 is used to connect USB-compatible devices, such as a USB keyboard, a USB mouse, a USB storage device, or a USB printer.

## Attaching your computer to a docking station

### Notes:

- The ThinkPad Basic Docking Station does not ship with a system lock installed. If you do not purchase and install a system lock, skip step 4 and step 7 in the following instruction to attach your computer to the ThinkPad Basic Docking Station.
- If you attach the computer to the docking station, but do not connect the docking station to ac power, your computer consumes battery power.

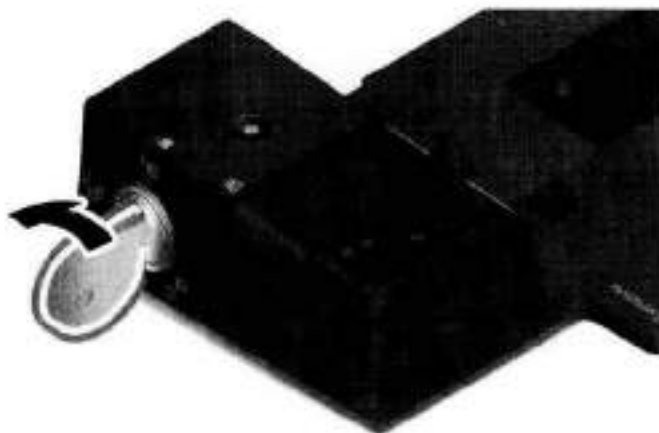
To attach your computer to a docking station, do the following:

1. Connect the docking station to ac power.
2. Disconnect the cables and devices from the left side of the computer.

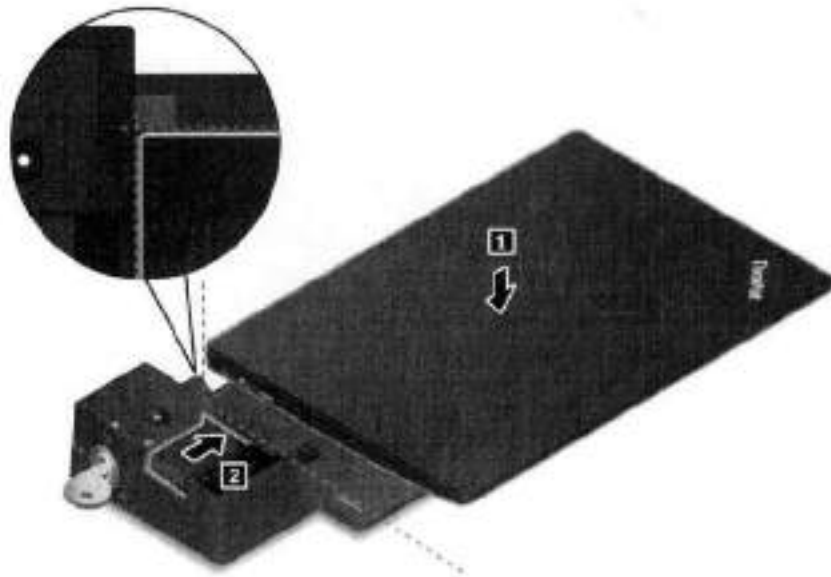
3. Remove the cover from your computer as shown.



4. Ensure that you turn the system lock key to the unlocked position (☞).



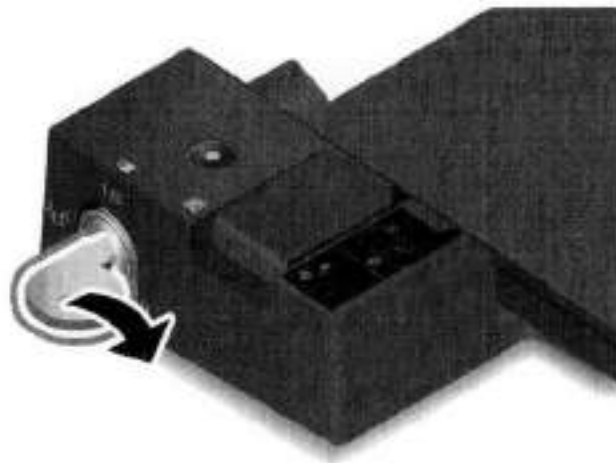
5. Align the top-left corner of the computer with the guide post of the docking station. Attach your computer to the docking station as shown **1** until you hear a click. Slide the latch in the direction as shown **2**.



6. Check the docking status indicator. The docking status indicator turns on when the computer is successfully docked.

**Note:** If the indicator is off, your computer is not attached to the docking station successfully. To solve the problem, detach and reattach the computer.

7. Turn the system lock key to the locked position (Ⓐ).



**Attention:** When the computer is attached to a docking station, do not pick up the assembly by taking hold of the computer only. Always hold the whole assembly. Otherwise the docking station might drop down.

## Detaching your computer from a docking station

To detach your computer from a docking station, do the following:

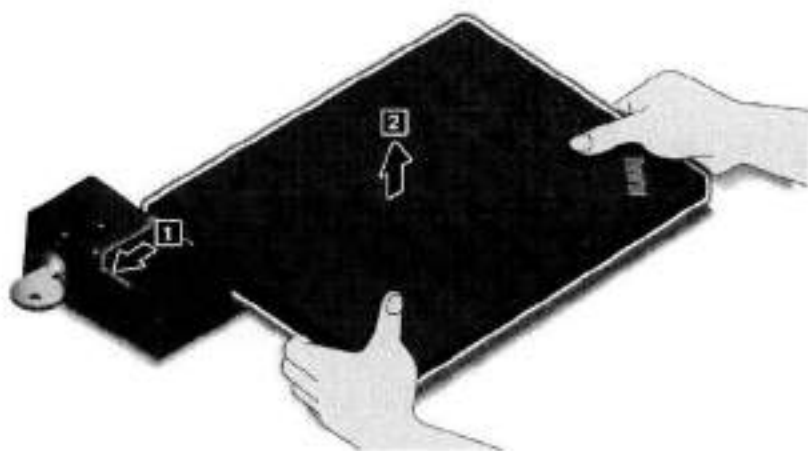


**Note:** The ThinkPad Basic Docking Station does not ship with a system lock installed. If you do not purchase and install a system lock, skip step 1 in the following instruction to detach your computer from the ThinkPad Basic Docking Station.

1. Turn the system lock key to the unlocked position (2⇄).



2. Slide the latch in the direction as shown 1 to release the computer, and then grasp both sides of the computer to remove it 2.

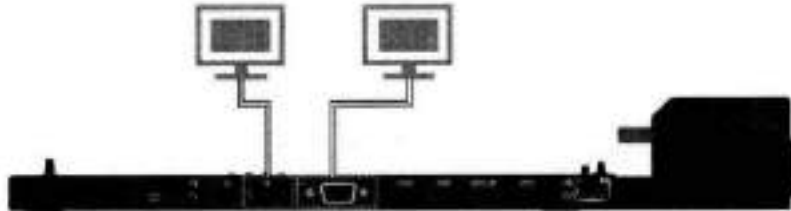


### Guidelines on connecting multiple external displays

You can connect multiple external displays to a supported ThinkPad docking station. To ensure that the multiple displays work correctly, observe the following guidelines and connect the external displays to the appropriate connectors.

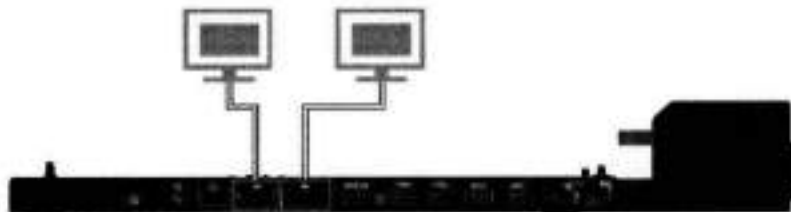
### ThinkPad Basic Docking Station

Up to two external displays connected to the DisplayPort and the VGA connectors can work at the same time.



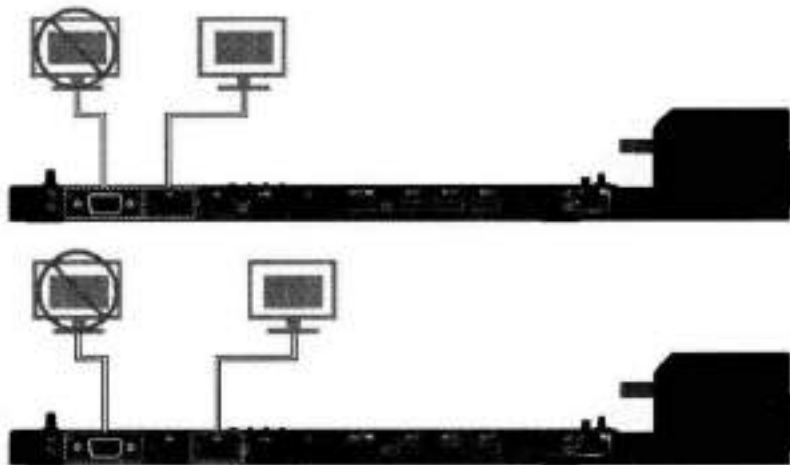
### ThinkPad Pro Docking Station

Up to two external displays connected to the two DisplayPort connectors can work at the same time.



### ThinkPad Ultra Docking Station

- Do not connect multiple external displays to the VGA and DisplayPort connectors at the same time. Otherwise, only the external display connected to the DisplayPort connector will work.



- Up to three external displays connected to the two DisplayPort connectors and the HDMI connector can work at the same time.



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## Chapter 4. Accessibility, ergonomic, and maintenance information

This chapter provides information about accessibility, ergonomic, and cleaning and maintenance.

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### Accessibility information

Lenovo is committed to providing users who have hearing, vision, and mobility limitations with greater access to information and technology. This section provides information about the ways these users can get the most out of their computer experience. You also can get the most up-to-date accessibility information from the following Web site:

<https://www.lenovo.com/accessibility>

#### Keyboard shortcuts

The following list contains keyboard shortcuts that can help make your computer easier to use.

**Note:** Depending on your keyboard, some of the following keyboard shortcuts might not be available.

- **Windows logo key + U:** Open Ease of Access Center
- **Right Shift for eight seconds:** Turn on or turn off Filter Keys
- **Shift five times:** Turn on or turn off Sticky Keys
- **Num Lock for five seconds:** Turn on or turn off Toggle Keys
- **Left Alt+Left Shift+Num Lock:** Turn on or turn off Mouse Keys
- **Left Alt+Left Shift+PrtScn (or PrtSc):** Turn on or turn off High Contrast

For more information, go to <https://windows.microsoft.com/>, and then search using any of the following keywords: keyboard shortcuts, key combinations, shortcut keys.

#### Ease of Access Center

Ease of Access Center on the Windows operating system enables you to configure your computers to suit their physical and cognitive needs.

To access Ease of Access Center, do the following:

1. Go to Control Panel, and ensure that you view Control Panel using Category.
2. Click **Ease of Access → Ease of Access Center**.
3. Choose the appropriate tool by following the instructions on the screen.

Ease of Access Center mainly includes the following tools:

- **Magnifier**  
Magnifier is a useful utility that enlarges the entire screen or part of the screen so that you can see the items better.
- **Narrator**  
Narrator is a screen reader that reads what is displayed on the screen aloud and describes events such as error messages.
- **On-Screen Keyboard**

If you prefer to type or enter data into your computer using a mouse, joystick, or other pointing device instead of a physical keyboard, you can use On-Screen Keyboard. On-Screen Keyboard displays a visual keyboard with all the standard keys. You can select keys using the mouse or another pointing device, or you can tap to select the keys if your computer supports multi-touch screen.

- **High Contrast**

High Contrast is a feature that heightens the color contrast of some text and images on your screen. As a result, those items are more distinct and easier to identify.

- **Personalized keyboard**

Adjust keyboard settings to make your keyboard easier to use. For example, you can use your keyboard to control the pointer and make the keyboard easier to type certain key combinations.

- **Personalized mouse**

Adjust mouse settings to make your mouse easier to use. For example, you can change the pointer appearance and make your mouse easier to manage windows.

### **Speech Recognition**

Speech Recognition enables you to control your computer by voice.

Using only your voice, you can start programs, open menus, click objects on the screen, dictate text into documents, and write and send e-mails. Everything you do with the keyboard and mouse can be done with only your voice.

To use Speech Recognition, do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Ease of Access → Speech Recognition**.
3. Follow the instructions on the screen.

### **Screen-reader technologies**

Screen-reader technologies are primarily focused on software program interfaces, help systems, and various online documents. For additional information about screen readers, see the following:

- Using PDFs with screen readers:  
<https://www.adobe.com/accessibility.html?promoid=DJGVE>
- Using the JAWS screen reader:  
<https://www.freedomscientific.com/Products/Blindness/JAWS>
- Using the NVDA screen reader:  
<https://www.nvaccess.org/>

### **Screen resolution**

You can make the text and images on your screen easier to read by adjusting the screen resolution of your computer.

To adjust the screen resolution, do the following:

1. Right-click an empty area of the desktop and then click **Display settings → Display**.
2. Follow the instructions on the screen.

**Note:** Setting a resolution too low might prevent some items from fitting on the screen.

### Customizable item size

You can make the items on your screen easier to read by changing the item size.

- To change the item size temporarily, use the Magnifier tool in Ease of Access Center.
- To change the item size permanently, do the following:
  - Change the size of all the items on your screen.
    1. Right-click an empty area of the desktop and then click **Display settings** → **Display**.
    2. Change the item size by following the instructions on the screen. For some applications, your configuration might not take effect until you sign out and then sign in again.
  - Change the size of the items on a Web page.

Press and hold Ctrl, and then press the plus-sign key (+) to enlarge or the minus-sign key (-) to reduce the text size.
  - Change the size of the items on the desktop or a window.

**Note:** This function might not work on some windows.

If your mouse has a wheel, press and hold Ctrl, and then scroll the wheel to change the item size.

### Industry-standard connectors

Your computer provides industry-standard connectors that enable you to connect assistive devices.

### Documentation in accessible formats

Lenovo provides electronic documentation in accessible formats, such as properly tagged PDF files or HyperText Markup Language (HTML) files. Lenovo electronic documentation is developed to ensure that visually impaired users can read the documentation through a screen reader. Each image in the documentation also includes adequate alternative text so that visually impaired users can understand the image when they use a screen reader.

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## Ergonomic information

Good ergonomic practice is important to get the most from your personal computer and to avoid discomfort. Arrange your workplace and the equipment you use to suit your individual needs and the kind of work that you perform. In addition, use healthy work habits to maximize your performance and comfort when using your computer.

Working in the virtual office might mean adapting to frequent changes in your environment. Adapting to the surrounding light sources, active seating, and the placement of your computer hardware, can help you improve your performance and achieve greater comfort.

This example shows someone in a conventional setting. Even when not in such a setting, you can follow many of these tips. Develop good habits, and they will serve you well.



**General posture:** Make minor modifications in your working posture to deter the onset of discomfort caused by long periods of working in the same position. Frequent short breaks from your work also help to prevent minor discomfort associated with your working posture.

**Display:** Position the display to maintain a comfortable viewing distance of 510 mm to 760 mm (20 inches to 30 inches). Avoid glare or reflections on the display from overhead lighting or outside sources of light. Keep the display screen clean and set the brightness to levels that enable you to see the screen clearly. Press the brightness control keys to adjust display brightness.

**Head position:** Keep your head and neck in a comfortable and neutral (vertical, or upright) position.

**Chair:** Use a chair that gives you good back support and seat height adjustment. Use chair adjustments to best suit your comfort posture.

**Arm and hand position:** If available, use chair arm rests or an area on your working surface to provide weight support for your arms. Keep your forearms, wrists, and hands in a relaxed and neutral (horizontal) position. Type with a soft touch without pounding the keys.

**Leg position:** Keep your thighs parallel to the floor and your feet flat on the floor or on a footrest.

#### **What if you are traveling?**

It might not be possible to observe the best ergonomic practices when you are using your computer while on the move or in a casual setting. Regardless of the setting, try to observe as many of the tips as possible. Sitting properly and using adequate lighting, for example, helps you maintain desirable levels of comfort and performance. If your work area is not in an office setting, ensure to take special note of employing active sitting and taking work breaks. Many ThinkPad product solutions are available to help you modify and expand your computer to best suit your needs. You can find some of these options at <http://www.lenovo.com/essentials>. Explore your options for docking solutions and external products that provide the adjustability and features that you want.

#### **Questions about vision?**

The visual display screens of ThinkPad notebook computers are designed to meet the highest standards. These visual display screens provide you with clear, crisp images and large, bright displays that are easy to see, yet easy on the eyes. Any concentrated and sustained visual activity can be tiring. If you have questions on eye fatigue or visual discomfort, consult a vision-care specialist for advice.

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## **Cleaning and maintenance**

With appropriate care and maintenance your computer will serve you reliably. The following topics offer information to help you keep your computer in top working order.

#### **Basic maintenance tips**

Here are some basic points about keeping your computer functioning properly:

- Store packing materials safely out of the reach of children to prevent the risk of suffocation from plastic bags.
- Keep your computer away from magnets, activated cellular phones, electrical appliances, or speakers (more than 13 cm or 5 inches).
- Avoid subjecting your computer to extreme temperatures (below 5°C/41°F or above 35°C/95°F).
- Avoid placing any objects (including paper) between the display and the keyboard or the palm rest.
- Your computer display is designed to be opened and used at an angle slightly greater than 90 degrees. Do not open the display beyond 180 degrees. Otherwise, the computer hinge might get damaged.

- Do not turn your computer over when the ac power adapter is plugged in, otherwise, it could break the adapter plug.
- Before moving your computer, be sure to remove any media, turn off attached devices, and disconnect cords and cables.
- When picking up your open computer, hold it by the bottom. Do not pick up or hold your computer by the display.
- Only an authorized ThinkPad repair technician should disassemble and repair your computer.
- Do not modify or tape the latches to keep the display open or closed.
- Avoid directly exposing your computer and peripherals to the air from an appliance that can produce negative ions. Wherever possible, ground your computer to facilitate safe electrostatic discharge.

#### **Cleaning your computer**

It is a good practice to clean your computer periodically to protect the surfaces and ensure trouble-free operation.

**Cleaning the computer cover:** Wipe it with a lint-free cloth dampened in mild soap and water. Avoid applying liquids directly to the cover.

**Cleaning the keyboard:** Wipe the keys one by one with a lint-free cloth dampened in mild soap and water. If you wipe several keys at a time, the cloth might hook onto an adjacent key and possibly damage it. Avoid spraying cleaner directly onto the keyboard. To remove any crumbs or dust from beneath the keys, you can use a camera blower with a brush or use cool air from a hair dryer.

**Cleaning the computer screen:** Scratches, oil, dust, chemicals, and ultraviolet light can affect the performance of your computer screen. Use a dry, soft lint-free cloth to wipe the screen gently. If you see a scratchlike mark on your screen, it might be a stain. Wipe or dust the stain gently with a soft, dry cloth. If the stain remains, moisten a soft, lint-free cloth with water or eyeglass cleaner, but do not apply liquids directly to your computer screen. Ensure that the computer screen is dry before closing it.





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## Chapter 5. Security

This chapter provides information about how to protect your computer from unauthorized use.

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### Using passwords

This topic provides information about how to use the power-on password, supervisor password, and hard disk password.

#### Passwords introduction

You can help prevent your computer from unauthorized use by using passwords. After you set a password, a prompt is displayed on the screen each time you turn on the computer. Enter your password at the prompt. You cannot use the computer unless you type the correct password.

If you have set a power-on password, a supervisor password, or a hard disk password, it unlocks automatically when the computer resumes from sleep mode.

**Note:** If a Windows password has been set, you are prompted to enter it when the computer resumes from sleep mode.

#### Power-on password

You can set a power-on password to help protect your computer against unauthorized access.

If you set a power-on password, the password prompt is displayed on the screen whenever you turn on the computer. You must enter the correct password to start using the computer.



When this icon is displayed, type a power-on password or a supervisor password.

#### Supervisor password

The supervisor password protects the system information stored in the ThinkPad Setup program. It provides the following security features:

- If only a supervisor password is set, a password prompt is displayed when you try to start the ThinkPad Setup program. Unauthorized users cannot change most of the system configuration options in the ThinkPad Setup program without the password.
- The system administrator can use the supervisor password to access a computer even if the user of that computer has set a power-on password. The supervisor password overrides the power-on password.
- The system administrator can set the same supervisor password on many ThinkPad notebook computers to make administration easier.

#### Hard disk passwords

Setting a hard disk password prevents unauthorized access to the data on the hard disk drive. When a hard disk password is set, you are prompted to type a valid password each time you try to access the hard disk drive.

The following two types of hard disk passwords can help protect the information stored on the storage drive:




- **User hard disk password**

If a user hard disk password has been set, but no master hard disk password has been, the user must enter the user hard disk password to access files and applications on the storage drive.

- **Master hard disk password**

The master hard disk password also requires a user hard disk password. The master hard disk password is set and used by a system administrator. It enables the administrator to access any storage drive in a system like a master key. The administrator sets the master password; then assign a user password for each computer in the network. The user can then change the user password as desired, but the administrator still can get access by using the master password.

When a master hard disk password is set, only the administrator can remove the user hard disk password.

When this icon  is displayed, type a user hard disk password. To type a master hard disk password, press F1. When the icon changes to , type the master hard disk password. To return to the icon , press F1 again.

**Tips on using the hard disk passwords:**

- You can set the minimum length of a hard disk password.
- If you set a hard disk password of over seven characters, the storage drive can be used only with a computer that can recognize a hard disk password of over seven characters. If you then install the storage drive in a computer that cannot recognize a hard disk password that contains more than seven characters, you cannot access the drive.
- Record your password and store it in a safe place. If you forget the user hard disk password, or both user and master hard disk passwords, Lenovo cannot reset your passwords or recover data from the storage drive. You must take your computer to a Lenovo reseller or a marketing representative to have the storage drive replaced. Proof of purchase is required, and a fee will be charged for parts and service.

**Notes:** The eDrive storage drives or Trusted Computing Group (TCG) Opal-compliant storage drives provide self-encryption capabilities to secure your data.

- If a TCG Opal-compliant storage drive and a TCG Opal management software program are installed, and the TCG Opal management software program is activated, the hard disk password is not available.
- If an eDrive storage drive is installed in your computer, and your computer is preinstalled with the Windows 10 operating system, the hard disk password is not available.

## Setting, changing, or removing a password

Before you start, print these instructions.

To set, change, or remove a password, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Security** → **Password** by using the directional keys.
3. Depending on the password type, select **Power-on Password**, **Supervisor Password**, or **Hard disk x Password**.
4. Follow the instructions on the screen to set, change, or remove a password.

You might want to record your password and store it in a safe place. Otherwise, if you forget the password, you have to take your computer to a Lenovo reseller or a marketing representative to have the password canceled.

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## Hard disk security

To protect the computer from unauthorized security attacks, refer to the following tips to enhance security:

- Set a power-on password as well as a hard disk password. For security, a longer password is recommended.
- The hard disk drive built into your computer can be protected by UEFI BIOS. To provide reliable security, use the security chip and a security program with the Trusted Platform Module (TPM) management feature. See "Setting the security chip" on page 53.
- If a Disk Encryption storage drive is installed in your computer, ensure to protect the contents of your computer from unauthorized access by use of drive encryption software, such as Microsoft Windows BitLocker® Drive Encryption.
- Before you dispose of, sell, or hand over your computer, delete the data stored on it. For more information, see "Deleting data from your storage drive" on page 56.

### Using Windows BitLocker Drive Encryption

To help protect your computer against unauthorized access, use the drive encryption software, such as Windows BitLocker Drive Encryption.

Windows BitLocker Drive Encryption (referred to as BitLocker) is an integral security feature of some editions of the Windows operating system. It can help you protect the operating system and data stored on your computer, even if your computer is lost or stolen. BitLocker can encrypt all user and system files, including the swap and hibernation files.

BitLocker uses the TPM to provide enhanced protection for your data and to ensure early boot component integrity. A compatible TPM is defined as a V2.0 TPM.

To check the BitLocker status, go to Control Panel, view Control Panel by Category, and click **System and Security** → **BitLocker Drive Encryption**.

For more information, see the help system of the Windows operating system, or search for "Microsoft Windows BitLocker Drive Encryption Step-by-Step Guide" on the Microsoft Web site.

### Disk Encryption hard disk drive and Encryption solid-state drive

Some models contain the Disk Encryption hard disk drive, Encryption solid-state drive, or Encryption hybrid drive. This encryption technology helps to protect your computer against security attacks on media, NAND flash, or device controllers by use of a hardware encryption chip. For the efficient use of the encryption feature, set a hard disk password for the internal storage drive.

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## Setting the security chip

Strict security requirements are imposed on network client computers that transfer confidential information electronically. Depending on the options you ordered, your computer might have an embedded security chip (a cryptographic microprocessor). With the security chip, you can do the following:

- Protect your data and system
- Strengthen access controls
- Secure communications

Before you start, print these instructions.

To set an item on the **Security Chip** submenu, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Security** → **Security Chip** by using the directional keys.
3. Press Enter. The **Security Chip** submenu opens.
4. Move to an item you want to set by using the directional keys. When the item is highlighted, press Enter.
5. Set other items that you want to set.
6. Press F10. A Setup Confirmation window is displayed. Select **Yes** to save the configuration changes and exit.

**Notes:**

- Ensure that the supervisor password has been set in ThinkPad Setup. Otherwise anyone can change the settings for the security chip.
- When you clear the security chip, turn off your computer and then turn it on again after you set the security chip to **Active**. Otherwise, the **Clear Security Chip** option is not displayed.

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## Using the fingerprint reader

Depending on the model, your computer might have a fingerprint reader. Fingerprint authentication can replace your passwords, such as the Windows password, power-on password, and hard disk password. In this way, you can log in to your computer simply and securely.

### Enrolling your fingerprints

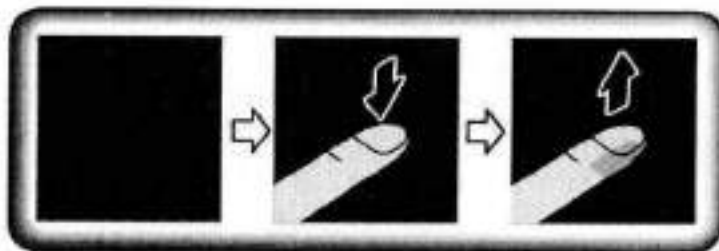
To enable fingerprint authentication, enroll your fingerprints first. During the enrollment, the fingerprints are associated with the Windows password automatically. It is recommended that you enroll more than one fingerprint in case of any injuries to your fingers.

To enroll your fingerprints, do the following:

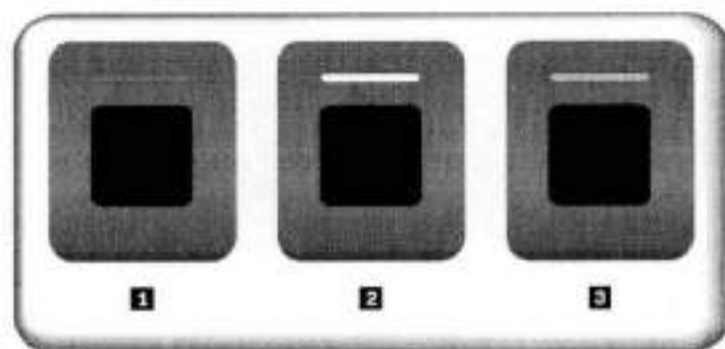
1. Open the Start menu and then click **Settings** → **Accounts** → **Sign-in options**.
2. Follow the instructions on the screen to finish the enrollment.

### Scanning your finger

To scan your finger, tap the fingerprint reader with the top joint of your finger and hold your finger there for one or two seconds with a little pressure. Then lift the finger to complete one scan.



## Fingerprint reader indicator



- ❑ 1 Off: The fingerprint reader is not ready for tapping.
- 2 White: The fingerprint reader is ready for tapping.
- 3 Amber, blinking: The fingerprint cannot be authenticated.

### Associating your fingerprints with your power-on password and hard disk password

To associate your fingerprints with your power-on password and hard disk password, manually create a connection by doing the following:

1. Turn off and then turn on the computer.
2. When prompted, scan your finger on the fingerprint reader.
3. Enter your power-on password, hard disk password, or both as required. The connection is created.

When you start the computer again, you can use your fingerprints to log in to the computer with no need to enter your Windows password, power-on password, and hard disk password.

**Attention:** If you always use your fingerprint to log in to the computer, you might forget your passwords. Write down your passwords, and keep them in a safe place. If you forget your power-on password, you must take your computer to a Lenovo-authorized servicer or a marketing representative to have the password canceled. If you forget your hard disk password, Lenovo cannot reset your password or recover data from the storage drive. You must take your computer to a Lenovo-authorized servicer or a marketing representative to have the storage drive replaced. Proof of purchase is required, and a fee will be charged for parts and service.

### Maintaining the fingerprint reader

The following actions could damage the fingerprint reader or cause it not to work properly:

- Scratching the surface of the reader with a hard, pointed object
- Scraping the surface of the reader with your fingernail or anything hard
- Using or touching the reader with a dirty finger

If you notice any of the following conditions, gently clean the surface of the reader with a dry, soft, lint-free cloth:

- The surface of the reader is dirty or stained.
- The surface of the reader is wet.
- The reader often fails to enroll or authenticate your fingerprint.

If your finger has any of the following conditions, you might not be able to register or authenticate it:

- Your finger is wrinkled.
- Your finger is rough, dry, or injured.
- Your finger is stained with dirt, mud, or oil.
- The surface of your finger is different from the one when you enrolled your fingerprint.
- Your finger is wet.
- Your finger that you are currently using has not been enrolled before.

To improve the situation, try the following:

- Clean or wipe your hands to remove any excess dirt or moisture from the fingers.
- Enroll and use a different finger for authentication.

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## Deleting data from your storage drive

Some of the data stored on the storage drive might be sensitive. Handing your computer over to someone else without deleting the installed software, such as operating systems and programs, might even violate the license agreements. Be sure to delete data stored on the storage drive before you dispose of, sell, or hand over your computer.

You can use the following methods to delete data from the storage drive:

- Move the data to the Recycle Bin, and then empty the Recycle Bin.
- Format your storage drive, using the software to initialize it.
- Use the recovery program provided by Lenovo to bring the storage drive back to the factory default settings.

These operations, however, only change the file location of the data; they do not delete the data itself. The data is still there, even though it seems to be lost. Thus, it is sometimes possible to read the data by use of special software for data recovery. There is a risk that people of bad faith might read and misuse the critical data on storage drives for unexpected purposes.

To prevent leakage of data, it is important that you delete all the data from the hard disk drive when you dispose of, sell, or hand over your computer. You can destroy the data physically by smashing the hard disk drive with a hammer, or magnetically by means of strong magnetic power, thus making the data unreadable. But it is recommended that you use the software (payware) or service (pay service) developed for that purpose. The process might take several hours.

For disposing of data on the solid-state drive, Lenovo provides the Drive Erase Utility for Resetting the Cryptographic Key and Erasing the Solid State Drive tool.

Some computers might support a Disk Encryption hard disk drive or Encryption solid-state drive and have such a drive installed. You can logically dispose of all the data on the drive in a short time by erasing the cryptographic key. The data encrypted with the old key is not physically erased but remains on the drive; however, it cannot be decrypted without the old key. This feature is also available with the Drive Erase Utility for Resetting the Cryptographic Key and Erasing the Solid State Drive tool.

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## Using firewalls

If your system is preinstalled with a firewall program, it protects against computer Internet security threats, unauthorized access, intrusions, and Internet attacks. It also protects your privacy.

For more information about how to use the firewall program, see the help system that comes with the program.

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## **Protecting data against viruses**

Lenovo provides a full version of antivirus software on your computer with a free 30-day subscription. After 30 days, you must renew the license to continue receiving the antivirus software updates.

For more information about your antivirus software, see the help system of your antivirus software.





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## Chapter 6. Advanced configuration

This chapter provides information to help you further configure the computer:

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### Installing the Windows 10 operating system

In some situations, you might need to install a new operating system. This topic provides instructions on how to install a Windows 10 operating system.

Before you start, print these instructions.

**Attention:** The process of installing a new operating system deletes all the data on your internal storage drive, including the data that were stored in a hidden folder.

To install the Windows 10 operating system, do the following:

1. Ensure that you set the security chip to TPM 2.0. For more information, see "Setting the security chip" on page 53.
2. For computer models that support the Intel Optane™ technology, start the ThinkPad Setup program and select **Config** → **Storage** → **Controller Mode**. Ensure that **RST mode** is selected.
3. Connect the drive that contains the operating system installation program to the computer.
4. Start the ThinkPad Setup program. See "Using the ThinkPad Setup program" on page 61.
5. Select **Startup** → **Boot** to display the **Boot Priority Order** submenu.
6. Select the drive that contains the operating system installation program, for example, **USB HDD**. Then press Esc.
7. Select **Restart** and ensure that **OS Optimized Defaults** is enabled. Then press F10 to save the settings and exit the ThinkPad Setup program.
8. Follow the on-screen instructions to install the device drivers and necessary programs. See "Installing device drivers" on page 60.
9. After installing the device drivers, apply Windows Update to get the latest modules, for example the security patches.
10. Depending on your preference, install Lenovo programs. For information about Lenovo programs, see "Lenovo programs" on page 13.

**Note:** After installing the operating system, do not change the initial **UEFI/Legacy Boot** setting in the ThinkPad Setup program. Otherwise, the operating system will not start correctly.

For computer models that support the Intel Optane technology, continue to enable the Intel Optane memory by doing the following:

1. Go to <http://www.lenovo.com/support>. Download and install the Intel Rapid Storage Technology (iRST) Console with Device Driver on your computer.
2. Run the iRST Console with Device Driver.
3. Click **Intel® Optane™ Memory** and then follow the instructions on the screen to enable it.

When you install the Windows 10 operating system, you might need one of the following country or region codes:

Country or region	Code	Country or region	Code
China	SC	Netherlands	NL
Denmark	DK	Norway	NO
Finland	FI	Spain	SP
France	FR	Sweden	SV
Germany	GR	Taiwan and Hong Kong	TC
Italy	IT	United States	US
Japan	JP		

## Installing device drivers

Device drivers are programs that contain instructions for the operating system about how to operate or "drive" a certain piece of hardware. Each hardware component on your computer has its own specific driver. If you add a component, the operating system must be instructed on how to operate that piece of hardware. After you install the driver, the operating system can recognize the hardware component and understand how to use it.

**Note:** Because drivers are programs, like any other file on your computer, they are susceptible to corruption and might not perform properly if corruption occurs.

It is not always necessary to download the latest drivers. However, you should download the latest driver for a component when you notice poor performance from that component or when you added a component. This action might eliminate the driver as the potential cause of a problem.

### Getting the latest drivers from the Web site

You can download and install updated device drivers from the Lenovo Support Web site by doing the following:

1. Go to <http://www.lenovo.com/support>.
2. Select the entry for your computer and then follow the instructions on the screen to download and install necessary software.

### Getting the latest drivers using Lenovo Companion

The system update function of Lenovo Companion helps you keep the software on your computer up-to-date. Update packages are stored on Lenovo servers and can be downloaded from the Lenovo Support Web site. Update packages can contain applications, device drivers, UEFI BIOS flashes, or software updates. When Lenovo Companion connects to the Lenovo Support Web site, the program automatically recognizes the following information and determines what updates are available for your computer:

- Machine type and model of your computer
- Installed operating system
- Language of the operating system

Lenovo Companion then displays a list of update packages and categorizes each update as critical, recommended, or optional to help you understand the importance. You have complete control of which updates to download and install. After you select the update packages you want, Lenovo Companion automatically downloads and installs the updates.

Lenovo Companion is preinstalled on your computer and is ready to run. The only prerequisite is an active Internet connection. You can start the program manually, or you can use the schedule feature to enable the

program to search for updates automatically at specified intervals. You also can predefine scheduled updates to search by the critical severity level so the list you choose from contains only those update types that you need.

For more information about how to use Lenovo Companion, see the help system of the program.

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## Using the ThinkPad Setup program

The ThinkPad Setup program enables you to select the preferred settings for your computer through configuring the BIOS.

### Configuring ThinkPad Setup

The ThinkPad Setup program menu lists various items about system configuration.

**Attention:** The default configurations are already optimized for you. Improper change of the configurations might cause unexpected results.

To configure ThinkPad Setup, do the following:

1. Restart the computer. When the logo screen is displayed, press F1. The ThinkPad Setup program starts.

**Note:** If you are required to enter the supervisor password, enter the correct password. You also can press Enter to skip the password prompt and start the ThinkPad Setup program. If you do not enter the password, you cannot change the configurations that are protected by the supervisor password.

2. Use the arrow keys to select a tab; or use the arrow keys to locate an item and press Enter to select it. Then the supported submenu is displayed.
3. Default values are in **boldface**. Set the value of an item by doing one of the following:
  - Press F6 to change to a higher value.
  - Press F5 to change to a lower value.
4. Press the Esc key to exit the submenu and return to the parent menu. Then use the same method mentioned above to change other configurations.
5. When you complete the configuration, press F10 to save and exit. You also can select the **Restart** tab in the ThinkPad Setup menu, and restart your computer with one of the provided options.

You can press F9 to restore to the default settings.

### Changing the startup sequence

In some cases, you might have to change the startup sequence so that the computer starts from a desired device when powered on. Read this topic to learn how to change the computer startup sequence.

**Attention:**

- After you change the startup sequence, ensure that you select the correct device during a copy, a save, or a format operation. If you select the wrong device, the data on that device might be erased or overwritten.
- If you are using the Windows BitLocker Drive Encryption feature and your computer has a Trusted Platform Module, do not change the startup sequence. BitLocker Drive Encryption locks the computer when it detects the change of startup sequence.

To change the startup sequence, do the following:

1. Access the ThinkPad Setup program and select **Startup → Boot**. Then press Enter. The default device order list is displayed.

2. Set the startup sequence as you desired.
3. Press F10 to save the changes and restart the system.

You also can change the startup sequence temporarily by doing the following:

1. Turn off the computer.
2. Turn on the computer. When the logo screen is displayed, press the F12 key.
3. Select the device that you want the computer to start from. Then press Enter.

**Note:** The **Boot** menu will be displayed if the computer cannot start from any devices or the operating system cannot be found.

## Updating the UEFI BIOS

The UEFI BIOS is the first program that the computer runs when the computer is turned on. The UEFI BIOS initializes the hardware components, and loads the operating system and other programs.

When you install a new program, device driver, or hardware component, you might be informed to update the UEFI BIOS. You can update the UEFI BIOS by starting your computer from a flash update disc or a flash update program running in the Windows environment.

The requirements for flash update are as follows:

- The computer must be started over LAN.
- The computer must be engaged in the Preboot eXecution Environment (PXE).
- A network-management program must be installed on the computer of the network administrator.

For instructions on how to update the UEFI BIOS, go to <http://www.lenovo.com/support>.

## BIOS menu

This topic introduces the following BIOS menus of your computer:

- Main menu
- Config menu
- Date/Time menu
- Security menu
- Startup menu
- Restart menu

**Note:** Depending on the model and operating system, the menu items and the default value might change without notice.

### Main menu

When you enter the ThinkPad Setup program, you first see the **Main** menu as follows:

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **UEFI BIOS Version**
- **UEFI BIOS Date**
- **Embedded Controller Version**
- **ME Firmware Version**

- **Machine Type Model**
- **System-unit serial number**
- **System board serial number**
- **Asset Tag**
- **CPU Type**
- **CPU Speed**
- **Installed Memory**
- **UUID**
- **MAC Address (Internal LAN)**
- **Preinstalled operating system license**
- **UEFI Secure Boot**
- **OA3 ID**
- **OA2**

### Config menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

### Network

- **Wake On LAN**

Values: Disabled, **AC only**, AC and Battery

Description: The network administrator can turn on a computer from a management console by using the Wake on LAN feature. If you select **AC Only**, the Wake on LAN feature is enabled only when the ac power adapter is attached. If you select **AC and Battery**, the Wake on LAN feature is enabled with any power sources.

**Notes:**

- The magic packet type Wake on LAN requires that the ac power is attached.
- The Wake on LAN feature does not work when the hard disk password is set.

- **Wake On LAN from Dock**

Values: Disabled, **Enabled**

Description: Enable or disable the Wake On LAN from Dock feature when the ThinkPad USB-C Dock or ThinkPad Thunderbolt 3 Dock is attached.

**Note:** The Wake on LAN from Dock feature does not work when the hard disk password is set.

- **Ethernet LAN Option ROM**

Values: Disabled, **Enabled**

Description: The Ethernet LAN Option ROM enables the startup from an integrated network device. This menu is displayed only in **Legacy Only** boot mode or **Both** boot mode with **Legacy first**.

- **UEFI IPv4 Network Stack**

Values: Disabled, **Enabled**

Description: Enable or disable Internet Protocol Version 4 (IPv4) network stack for UEFI environment. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**.

- **UEFI IPv6 Network Stack**

Values: Disabled, **Enabled**

Description: Enable or disable Internet Protocol Version 6 (IPv6) network stack for UEFI environment. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**.

- **UEFI PXE Boot Priority**

Values: IPv6 First, **IPv4 First**

Description: Select network stack priority for UEFI PXE boot. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**, when IPv6 and IPv4 stacks are both enabled.

- **Wireless Auto Disconnection**

Values: **Disabled**, Enabled

Description: Enable or disable the **Wireless Auto Disconnection** feature when the Ethernet cable is connected to the Ethernet LAN on system. If it is enabled, Wireless LAN signals are automatically turned off whenever Ethernet cable is connected.

**Note:** Ethernet attached by USB is not supported by this feature.

- **MAC address Pass Through**

Values: **Disabled**, Enabled

Description: Enable or disable the **MAC address Pass Through** function when a dock is attached. If you select **Enabled**, the MAC address for the dock will be changed to the Internal MAC address. If you select **Disabled**, the dock Ethernet uses its own MAC address.

## USB

- **USB UEFI BIOS Support**

Values: Disabled, **Enabled**

Description: Enable or disable the boot support for USB storage devices.

- **Always On USB**

Values: Disabled, **Enabled**

Description: Select **Enabled** to charge devices through the Always On USB connectors even when the computer is turned off, in sleep mode, or in hibernation mode.

- **Charge in Battery Mode**

Values: **Disabled**, Enabled

Description: It is supported only when **Always On USB** is **Enabled**. Select **Enabled** to charge devices through the Always On USB connectors even when the system is in hibernation mode, or is power-off and in battery operation.

## Keyboard/Mouse

- **TrackPoint**

Values: Disabled, **Enabled**

Description: Enable or disable the built-in TrackPoint pointing device.

- **Trackpad**

Values: Disabled, **Enabled**

Description: Enable or disable the built-in trackpad.

**Note:** If you want to use an external mouse, select **Disabled**.

- **Fn and Ctrl Key swap**

Values: **Disabled**, Enabled

Description: If you select **Enabled**, the Fn key works as the Ctrl key and the Ctrl key works as the Fn key.

**Note:** Only the Fn key can wake up the system from sleep mode.

- **Fn Sticky key**

Values: **Disabled**, Enabled

Description: If you select **Enabled**, you can press the Fn key (instead of press and hold) to keep it in a pressed condition. Then press the function key you want. The action is equivalent to pressing the function key simultaneously with the Fn key. When you press the Fn key twice, the Fn key will be locked in the press-and-hold mode until you press the Fn key again.

- **F1–F12 as Primary Function**

Values: **Disabled**, Enabled

Description: If you select **Enabled**, pressing the function keys directly inputs F1–F12. If you select **Disabled**, pressing the function keys directly initiates the special function printed as an icon on each key. To temporarily switch the above two functions, press Fn+Esc. The FnLock indicator is on when FnLock is enabled.

## Display

- **Boot Display Device**

Values: **ThinkPad LCD**, External Display

Description: Select the display device that you want to activate at boot time. This selection is effective for boot time, password prompt, and ThinkPad Setup. You can attach an external display to the USB-C connector or HDMI connector on your computer. If multiple displays are attached, the first recognized one will be activated at boot time.

- **Shared Display Priority**

Values: HDMI, **USB Type-C**

Description: Select the priority between shared display outputs. The HDMI connector and the rear USB Type-C connector share a single display output and the two connectors cannot be used simultaneously for the external display. This option chooses which connector is prioritized for the external display.

- **Total Graphics Memory**

Values: **256 MB**, 512 MB

Description: Allocate the total memory which Intel internal graphics shares.

**Note:** If you select **512 MB**, the maximum usable memory might be reduced on the 32-bit operating system.

- **Boot Time Extension**

Values: **Disabled**, 1 second, 2 seconds, 3 seconds, 5 seconds, 10 seconds

Description: This option defines the amount of time to extend the boot process, in seconds. The system cannot detect some external monitors during boot because they need a few seconds to be ready. Try this option if the monitor being used does not display the boot screen.

## Power

- **Intel SpeedStep® technology**

Values: Disabled, **Enabled**

Description: Select the mode of Intel SpeedStep technology at runtime. If you select **Disabled**, the highest speed, and runtime is not supported.

- **Mode for AC**

Values: **Maximum Performance**, Battery Optimized

Description: **Maximum Performance:** Always highest speed



– **Mode for Battery**

Values: Maximum Performance, **Battery Optimized**

Description: **Battery Optimized**: Always lowest speed

• **Adaptive Thermal Management**

Description: Select a thermal management scheme to use. The scheme affects fan sound, temperature, and performance.

– **Scheme for AC**

Values: **Maximum Performance**, Balanced

Description: **Maximum Performance**: Reduce CPU throttling. **Balanced**: Balanced sound, temperature and performance.

– **Scheme for Battery**

Values: Maximum Performance, **Balanced**

Description: **Balanced**: Balanced sound, temperature and performance. **Maximum Performance**: Reduce CPU throttling.

• **CPU Power Management**

Values: Disabled, **Enabled**

Description: Enable or disable the power-saving feature that stops the microprocessor clock automatically when there are no system activities. Normally, it is not necessary to change the setting.

• **Power On with AC Attach**

Values: **Disabled**, Enabled

Description: Enable or disable a feature that turns on the computer when the ac power adapter is attached. If you select **Enabled**, the system is powered on when the ac power adapter is attached. If the system is in hibernate state, the system resumes normal operation. If you select **Disabled**, the system is not powered on nor resumed when the ac power adapter is attached.

• **8254 Timer Clock Gating**

Values: **Auto**, Disabled

Description: Select 8254 Timer Clock Gating setting. If you select **Auto**, 8254 Timer clock stops only when the startup setting is set as **UEFI Only** and **CSM Support** is set as **No**. If you select **Disabled**, 8254 Timer clock is running always.

• **Disable Built-in Battery**

Values: Yes, No

Description: Temporary disable battery for servicing the system. After selecting this item, the system will be automatically powered off, then ready to be serviced. Note: the battery will be automatically enabled when the AC adapter is reconnected.

**Beep and Alarm**

• **Password Beep**

Values: **Disabled**, Enabled

Description: Enable or disable a beep when the computer is waiting for a power-on, hard disk, or supervisor password. Different beeps remind you that the password you entered is right or wrong.

• **Keyboard Beep**

Values: **Enabled**, Disabled

Description: Enable or disable a beep when unmanageable key combinations are pressed.

## Storage

**Note:** This menu is displayed when Intel Optane memory is installed.

- **Controller Mode**

Values: AHCI mode, **RST mode**

Description: If your computer has an Intel Optane memory installed, select **RST mode** so that you can enable the Intel Optane memory in the Windows operating system.

**Note:** If a hard disk password has been set, you cannot change this setting until you delete the hard disk password.

- **Intel (R) Rapid Storage Technology**

Description: Enter Intel (R) Rapid Storage Technology Configuration Utility to manage volumes on Intel (R) RAID Controller.

## Thunderbolt(TM) 3

- **Thunderbolt BIOS Assist Mode**

Values: Enabled, **Disabled**

Description: Enable or disable Thunderbolt BIOS Assist mode. If you select **Enabled**, Thunderbolt ports are controlled by BIOS instead of operating system, power consumption is increased, and wake from Modern Standby mode is disabled. You can only set to **Enabled** on the Linux and the Windows 10 (earlier than version 1709) operating systems.

- **Wake by Thunderbolt(TM) 3**

Values: Disabled, **Enabled**

Description: Enable or disable Wake Feature with Thunderbolt(TM) 3 Port. If you select **Enabled**, the battery life during low power state may become shorter.

- **Security level**

Values: No Security, **User Authorization**, Secure Connect, Display Port and USB

Description: Select the security level:

- No Security: Allow Thunderbolt devices to be connected automatically.
- User Authorization: Allow Thunderbolt devices to be connected after user authorization.
- Secure Connect: Allow Thunderbolt devices to be connected with a saved key that has been approved by the user.
- Display Port and USB: Allow only DisplayPort-compatible devices and USB devices to be connected. Thunderbolt devices are not allowed to be connected.

- **Support in Pre Boot Environment:**

Enable or disable the pre-OS support for devices connected to the Thunderbolt 3 port.

- **Thunderbolt(TM) device**

Values: **Disabled**, Enabled

Description: Enable or disable pre-OS support for Thunderbolt(TM) devices attached to Thunderbolt (TM) 3 port. To use a device in pre-boot environment, authorize it in the OS or set security level to No Security. To boot from a device, configure it in the **Startup → Boot** menu.

- **USB device**

Values: **Disabled**, Enabled

Description: Enable or disable pre-OS support for USB devices attached to Thunderbolt (TM) 3 port. To use a device in pre-boot environment, authorize it in the OS or set security level to No Security. To boot from a device, configure it in the **Startup → Boot** menu.

## Intel AMT

- **Intel (R) AMT Control**

Values: Disabled, **Enabled**, Permanently Disabled

Description: This option enables or disables Intel (R) Active Management Technology (AMT) function. If you select **Permanently Disabled**, you can never enable it again. Be cautious when you make the selection.

- **USB Key Provisioning**

Values: **Disabled**, Enabled, Permanently Disabled

Description: This option enables or disables USB key provisioning.

- **CIRA Timeout**

Values: 0–255

Description: Set the timeout option for the CIRA connection to be established. Selectable values are from 0 to 255. If you select **0**, use 60 seconds as the default timeout value. If you select **255**, the waiting time for establishing a connection is unlimited.

**Note:** The default value is 60 seconds.

- **Console Type**

Values: PC-ANSI, VT100, **VT100+**, VT-UTF8

Description: Select the console type for AMT. This console type must match the Intel AMT remote console.

## Date/Time menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **System Date**

Descriptions: Set or change the date of the system.

- **System Time**

Descriptions: Set or change the time of the system.

## Security menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

### Password

- **Supervisor Password**

Values: **Disabled**, Enabled

Descriptions: Set a supervisor password to prevent unauthorized users from changing the startup sequence, network related settings, and system date and time. For more information, see "Passwords Introduction" on page 51.

- **Lock UEFI BIOS Settings**

Values: **Disabled**, Enabled

Descriptions: Enable this option to prevent unauthorized users from changing any settings in ThinkPad Setup. To use this function, a supervisor password is required.

- **Password at Unattended Boot**

Values: Disabled, **Enabled**

Descriptions: When this option is enabled, a password prompt is displayed when the computer is turned on or resumed from hibernation mode by an unattended event such as a Wake on LAN attempt. To prevent unauthorized access, set the user authentication on the operating system.

- **Password at Restart**

Values: **Disabled**, Enabled

Descriptions: When this option is enabled, a password prompt is displayed when you restart the computer. To prevent unauthorized access, set the user authentication on the operating system.

- **Password at Boot Device List**

Values: **Disabled**, Enabled

Descriptions: If you enable this option, the supervisor password is required when you try to enter the **Boot** menu by repeatedly pressing F12. To use this function, a supervisor password must be set.

- **Password Count Exceeded Error**

Values: Disabled, **Enabled**

Descriptions: Enable this option to display the POST 0199 error message and prompt for the Security password.

- **Set Minimum Length**

Values: **Disabled**, x characters ( $4 \leq x \leq 12$ )

Descriptions: Specify a minimum length for power-on passwords and hard disk passwords. If a supervisor password is set, you cannot change the minimum length until you log in as a supervisor.

- **Power-On Password**

Values: **Disabled**, Enabled

Descriptions: Set a power-on password to protect the computer from unauthorized access. For more information, see "Passwords Introduction" on page 51.

- **Hard Disk x Password**

Values: **Disabled**, Enabled

Descriptions: Set a hard disk password to prevent unauthorized users from accessing data on the internal storage drive. For more information, see "Passwords Introduction" on page 51.

## Fingerprint

- **Predesktop Authentication**

Values: Disabled, **Enabled**

Descriptions: Enable or disable fingerprint authentication before the operating system is loaded.

- **Reader Priority**

Values: **External** → **Internal**, Internal Only

Descriptions: If your computer has an internal fingerprint reader and an attached external fingerprint reader, use this option to specify the fingerprint reader priority.

- **Security Mode**

Values: **Normal**, High

Descriptions: If the fingerprint is not authenticated, you can enter a password instead. If you have selected **Normal**, enter either the power-on password or the supervisor password; if you have selected **High**, supervisor password must be entered.

- **Password Authentication**

Values: Disabled, **Enabled**

Descriptions: Enable this option to use password authentication when fingerprints are not available. This item is displayed if **Security Mode** is set to **High**.

- **Reset Fingerprint Data**

Value: **Enter**

Descriptions: Use this option to erase all fingerprint data stored in the fingerprint reader and reset the settings to the factory default state. As a result, any power-on security features previously enabled will not work until they are re-enabled in the fingerprint software.

#### **Security Chip**

- **Security Chip Type**

Values: **TPM 2.0**

Descriptions: You can use a discrete TPM chip with TPM 2.0 mode.

- **Security Chip**

Values: **Enabled**, Disabled

Descriptions: Enable or disable the security chip.

- **Security Reporting Options**

- **SMBIOS Reporting**

Values: **Enabled**, Disabled

Descriptions: When enabled, changes to corresponding UEFI BIOS data are logged in a location, (PCR1, defined in the TCG standards), which other authorized programs can monitor, read and analyze.

- **Clear Security Chip**

Descriptions: Use this option to clear the encryption key. It will not be possible to access already-encrypted data after these keys are cleared.

- **Intel (R) TXT Feature**

Values: **Disabled**, Enabled

Descriptions: Enable or disable the Intel Trusted Execution Technology.

- **Physical Presence for Clear**

Values: **Disabled**, Enabled

Descriptions: If this option is enabled, a confirmation message is displayed when you clear the security chip.

#### **UEFI BIOS Update Option**

- **Flash BIOS Updating by End-Users**

Values: Disabled, **Enabled**

Descriptions: When this option is enabled, all users can update the UEFI BIOS. If you disable this option, the supervisor password will be required to update the UEFI BIOS.

- **Secure RollBack Prevention**

Values: **Disabled**, Enabled

Descriptions: When this option is disabled, you can flash the UEFI BIOS to earlier version.

- **Windows UEFI Firmware Update**

Values: Disabled, **Enabled**

Descriptions: This option enables or disables **Windows UEFI Firmware Update** feature. When this option is enabled, Windows UEFI firmware update is allowed.

## Memory Protection

- **Execution Prevention**

Values: Disabled, **Enabled**

Descriptions: Some computer viruses and worms cause memory buffers to overflow. By enabling this option, you can protect your computer against attacks from such viruses and worms. If the option is enabled but you find that a program does not run properly, disable this option first and then reset the settings.

## Virtualization

- **Intel Virtualization Technology**

Values: **Disabled**, Enabled

Descriptions: If this option is enabled, a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology.

- **Intel VT-d Feature**

Values: **Disabled**, Enabled

Descriptions: Intel VT-d stands for Intel Virtualization Technology for Directed I/O. When enabled, a VMM can utilize the platform infrastructure for I/O virtualization.

## I/O Port Access

Descriptions: Use this submenu to enable or disable the following hardware features:

- Ethernet LAN
- Wireless LAN
- Wireless WAN
- Bluetooth
- USB port
- Memory card slot
- Smart card slot
- Integrated camera
- Microphone
- Fingerprint reader
- Thunderbolt(TM) 3
- NFC device

## Internal Device Access

- **Bottom Cover Tamper Detection**

Values: **Disabled**, Enabled

Descriptions: When this option is enabled, supervisor password is required when a bottom cover tamper is detected. This option is not functional until a supervisor password is set.

- **Internal Storage Tamper Detection**

Values: **Disabled**, Enabled

Descriptions: When this option is enabled, removing any internal storage device when your computer is in sleep mode will be detected. If you remove the internal storage device while the computer is in sleep mode, the computer will shut down when you wake it up, and any unsaved data will be lost.

## Anti-Theft

- **Computrace Module Activation**

Values: Disabled, **Enabled**, Permanently Disabled

Descriptions: Enable the UEFI BIOS interface to activate the computrace module. Computrace is an optional monitoring service from Absolute Software. If you select **Permanently Disabled**, you cannot enable this setting again.

## Secure Boot

- **Secure Boot**

Values: **Disabled**, Enabled

Descriptions: Enable this option to prevent unauthorized operating systems from loading when you turn on the computer.

**Note:** Enabling **Secure Boot** requires to set the startup setting to **UEFI Only** and **CSM Support** to **No**.

- **Platform Mode**

Values: Setup Mode, **User Mode**

Descriptions: Specify the system operating mode.

- **Secure Boot Mode**

Values: **Standard Mode**, Custom Mode

Descriptions: Specify the **Secure Boot** mode.

- **Reset to Setup Mode**

Descriptions: Use this option to clear the current platform key and reset **Platform Mode** to **Setup Mode**.

- **Restore Factory Keys**

Descriptions: Use this option to restore all keys and certificates in **Secure Boot** databases to the factory defaults.

- **Clear All Secure Boot Keys**

Descriptions: Use this option to clear all keys and certificates in **Secure Boot** databases and install your own keys and certificates.

## Intel (R) SGX

- **Intel (R) SGX Control**

Values: Disabled, Enabled, **Software Controlled**

Descriptions: Enable or disable the Intel Software Guard Extensions (SGX) function. If you select **Software Controlled**, SGX will be controlled by the SGX application for UEFI boot OS.

- **Change Owner EPOCH**

Value: **Enter**

Descriptions: Change Owner EPOCH to a random value. Use this option to clear SGX user data.

## Device Guard

- **Device Guard**

Values: **Disabled**, Enabled

Descriptions: This option is used to support Microsoft Device Guard.

When this option is enabled, Intel Virtualization Technology, Intel VT-d Feature, Secure Boot, and OS Optimized Defaults are automatically enabled. Boot order is restricted to customer image only. To complete the configuration of Device Guard, you have to set a supervisor password.

When this option is disabled, the setup options are configurable and you can choose any boot options to start the computer.

## Startup menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **Boot**

Descriptions: Define the startup sequence.

- **Network Boot**

Descriptions: Select the boot device when the system wakes from LAN. If Wake On LAN is enabled, the network administrator can turn on all of the computers in a LAN remotely through network management software.

- **UEFI/Legacy Boot**

Values: **Both**, UEFI Only, Legacy Only

Descriptions: Define the system boot capability.

- **UEFI/Legacy Boot Priority**

Values: Legacy First, **UEFI First**

Description: Select the boot priority between UEFI and Legacy.

- **CSM Support** (for UEFI only)

Values: Yes, **No**

Description: Compatibility Support Module (CSM) is required for starting the legacy operating system. If you select **UEFI only**, **CSM Support** is selectable. For **Both** or **Legacy Only** mode, **CSM Support** is not selectable.

- **Boot Mode**

Values: **Quick**, Diagnostics

Descriptions: Define which screen is displayed during the POST, the logo screen or the text message screen.

- **Option Key Display**

Values: Disabled, **Enabled**

Descriptions: If you disable this option, the "To interrupt normal startup, press Enter." message will not be displayed during the POST.

- **Boot Device List F12 Option**

Values: Disabled, **Enabled**

Descriptions: If you enable this option, you can open the Boot Menu window by continuously pressing F12 when the computer is powered on.

- **Boot Order Lock**

Values: **Disabled**, Enabled

Descriptions: Enable this option to lock the boot device priority order.

## Restart menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **Exit Saving Changes**

Descriptions: Save the changes and restart the computer.



- **Exit Discarding Changes**

Descriptions: Discard the changes and restart the computer.

- **Load Setup Defaults**

Descriptions: Restore to the factory default settings.

**Note:** Enable OS Optimized Defaults to meet the Windows 10 certification requirements. When you change this setting, some other settings are changed automatically, such as **CSM Support**, **UEFI/Legacy Boot**, **Secure Boot**, and **Secure RollBack Prevention**.

- **Discard Changes**

Descriptions: Discard the changes.

- **Save Changes**

Descriptions: Save the changes.

---

## Using system management

This topic is primarily intended for the network administrators.

Your computer is designed for manageability, so that you can redirect more resources to better meet your business objectives.

This manageability, known as total cost of ownership (TCO), enables you to remotely operate client computers in the same way as you operate your own computer, such as turning on a client computer, formatting a storage drive, and installing a program.

Once the computer is configured and operational, you can manage it by using the software and the manageability features that are already integrated into the client computer and the network.

### Desktop Management Interface

The UEFI BIOS of your computer supports an interface called System Management BIOS (SMBIOS) Reference Specification, version 2.8 or later. SMBIOS provides information about the hardware components of your computer. It is the responsibility of the UEFI BIOS to provide information about itself and the devices on the system board. This specification documents the standards for getting access to this BIOS information.

### Preboot eXecution Environment

The Preboot eXecution Environment (PXE) technology makes the computer more manageable by enabling the computer to start from a server. Your computer supports the personal computer functions that PXE requires. For example, with the appropriate LAN card, your computer can be started from the PXE server.

**Note:** The Remote Initial Program Load (RIPL or RPL) function cannot be used with your computer.

### Wake on LAN

The network administrator can turn on a computer from a management console by using the Wake on LAN feature.

When the Wake on LAN feature is enabled, many operations, such as data transfer, software updates, and flash updates of the UEFI BIOS, can be done remotely without remote attendance. The updating process can perform after normal working hours and on weekends, so that the users are not interrupted during work, and the LAN traffic is kept to a minimum. It saves time and increases productivity.

If the computer is turned on through Wake on LAN, the computer starts follow the **Network Boot** sequence.

### Asset ID EEPROM

The Asset ID EEPROM contains information about the computer configuration and the serial numbers of the key components. It also includes a number of blank fields where you can record information about the end users in your network.

To enable a network administrator to remotely control your computer, set the following system-management features in the ThinkPad Setup program:

- Wake on LAN
- Network Boot sequence

**Note:** If a supervisor password has been set, you are required to enter the supervisor password when you start the ThinkPad Setup program.

#### Enabling or disabling the Wake on LAN feature

When the Wake on LAN feature is enabled and the computer is connected to a LAN, the network administrator can start the computer remotely from a management console, using a remote network-management program.

To enable or disable the Wake on LAN feature, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Config** → **Network**. The **Network** submenu is displayed.
3. Select a corresponding option for the Wake on LAN feature.
4. Press F10 to save the settings and exit.

#### Defining a Network Boot sequence

When the computer wakes on LAN, the computer boots from the device as specified on the **Network Boot** menu, and then follow the boot order list on the **Boot** menu.

To define a Network Boot sequence, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Startup** → **Network Boot**. The boot device list is displayed.
3. Select a boot device to make it as the top boot priority.
4. Press F10 to save the settings and exit.

You can press F9 to restore to the factory default settings.



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## Chapter 7. Troubleshooting computer problems

This chapter provides information about what to do if you experience a problem with your computer.

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### General tips for preventing problems

This topic provides the following tips to help you prevent computing problems:

- Empty your recycle bin on a regular basis.
- Use a disk defragment tool regularly on your storage drive to improve data seek and read times.
- To free up disk space, uninstall unused programs. You also might want to look for program duplication or overlapping versions.
- Clean out your Inbox, Sent, and Trash folders from your e-mail client program.
- Back up your data at least once a week. If critical data is present, it is a good idea to back up the data daily. Lenovo has many backup options available for your computer.
- Schedule system restore operations to take a system snapshot periodically. For information about system restore, see Chapter 8 "Recovery information" on page 95.
- Go to <http://www.lenovo.com/support> to download and install updates for the device drivers and UEFI BIOS when needed.
- Keep up to date for device drivers on other non-Lenovo hardware. Before updating device drivers, read the device driver information release notes for compatibility or known issues.
- Keep a log book. Entries might include major hardware or software changes, driver updates, minor issues you have experienced, and how you resolved the minor issues.
- If you ever need to run a recovery on your computer to return the preinstalled contents onto the machine, the following tips might help along the way:
  1. Remove all external devices such as the printer and keyboard.
  2. Ensure that your battery is charged and your computer has the ac power connected.
  3. Access ThinkPad Setup and load the default settings.
  4. Restart the computer and start the recovery operation.
  5. If your computer uses discs as the recovery media, do not remove the disc from the drive until prompted to do so.

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### Diagnosing problems with Lenovo Companion

Many computer problems can be solved without outside assistance. If you experience a problem with your computer, the first place to start is the troubleshooting information in your computer documentation. If you suspect a software problem, see the documentation, including readme files and help information systems, that come with the operating system or program.

ThinkPad notebook computers come with a set of diagnostic programs that you can use to help you identify hardware problems. Lenovo Companion is preinstalled on your computer and also is available for download at:

<https://shop.lenovo.com/us/en/accessories/software/apps/lenovo-apps/companion/>

**Note:** If you are unable to isolate and repair the problem yourself after running Lenovo Companion, save and print the log files created by the program. You need the log files when you speak to a Lenovo technical support representative.

Lenovo Companion supports the hardware scan function. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for optimal system performance. To run Lenovo Companion, see "Accessing Lenovo programs" on page 13.

The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. You can get the latest technical information and download device drivers and updates from the Lenovo Support Web site at:

<http://www.lenovo.com/support>

For additional information, see the help system of the program.

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## Troubleshooting

If your computer has an error, it typically displays a message or an error code, or makes a beep when you turn it on. When you experience a problem, see the corresponding symptom and solution in this topic to try to solve the problem by yourself.

### Computer stops responding

**Print these instructions now and keep them with your computer for reference later.**

**Problem:** My computer is unresponsive (I cannot use the ThinkPad pointing device or the keyboard).

**Solution:** Do the following:

1. Press and hold the power button until the computer turns off. If you cannot turn off the computer by pressing the power button, remove the ac power adapter and the removable battery. After the computer is turned off, reconnect the ac power adapter and reinstall the removable battery, and then restart the computer by pressing the power button. If the computer does not turn on, continue with step 2.
2. While the computer is turned off, remove all power sources from the computer (removable battery and the ac power adapter). Plug in the ac power adapter while keeping the removable battery out of the computer. If the computer does not turn back on, continue with step 3.

**Note:** When the computer starts up and enters the Windows environment, use the proper shutdown procedure to turn off the computer. When the computer is off, reattach the removable battery and restart the computer. If the computer does not start with the removable battery reattached, remove the removable battery and again start with step 2. If the computer starts with ac power but does not start when the removable battery is attached, call the Customer Support Center for support.

3. While the computer is off, remove all sources of power (removable battery and the ac power adapter). Remove all external devices that are attached to your computer (keyboard, mouse, printer, scanner, and so on). Repeat step 2. If step 2 is unsuccessful, continue with step 4.

**Note:** The following steps involve removing static sensitive components from your computer. Make sure that you are properly grounded and remove all sources of power attached to the computer. If you are uncomfortable or unsure about removing components, call the Customer Support Center for assistance.

4. While the computer is off, remove all sources of power and external hardware. Remove any non-original memory module added to your computer. After removing the extra memory module and reinstalling the original memory module, repeat step 2. If the computer still does not turn on, consult the user manual for other customer-replaceable components that are attached to your computer.

If the computer still does not start up, call the Customer Support Center and a Customer Support Specialist will assist you.

## Spills on the keyboard

**Problem:** I spill something on the computer.

**Solution:** Because most liquids conduct electricity, liquid spilled on the keyboard could create numerous short circuits and damage your computer. To solve the problem, do the following:

1. Ensure that no liquid creates a short circuit between you and the ac power adapter (if in use).
2. Carefully unplug the ac power adapter immediately.
3. Turn off the computer immediately. If the computer does not turn off, remove the removable battery. The more quickly you stop the current from passing through the computer the more likely you will reduce damage from short circuits.

**Attention:** Although you might lose some data or work by turning off the computer immediately, leaving the computer on might make your computer unusable.

4. Wait until you are certain that all the liquid is drained out from the keyboard drainage holes before turning on your computer.

## Error messages

- **Message:** 0177: Bad SVP data, stop POST task.

**Solution:** Checksum of the supervisor password in the EEPROM is not correct. The system board should be replaced. Have the computer serviced.

- **Message:** 0183: Bad CRC of Security Settings in EFI Variable. Enter ThinkPad Setup.

**Solution:** Checksum of the Security settings in the EFI Variable is not correct. Enter ThinkPad Setup to check security settings, press F10, and then press Enter to restart the system. If you still have a problem, have the computer serviced.

- **Message:** 0187: EAIA data access error

**Solution:** The access to EEPROM is failed. Have the computer serviced.

- **Message:** 0188: Invalid RFID Serialization Information Area

**Solution:** The EEPROM checksum is not correct (block # 0 and 1). The system board should be replaced, and the box serial number must be reinstalled. Have the computer serviced.

- **Message:** 0189: Invalid RFID configuration information area

**Solution:** The EEPROM checksum is not correct (block # 4 and 5). The system board should be replaced, and the universally unique identifier (UUID) must be reinstalled. Have the computer serviced.

- **Message:** 0190: Critical low-battery error

**Solution:** The computer turned off because the battery power is low. Connect the ac power adapter to the computer and charge the batteries.

- **Message:** 0191: System Security - Invalid remote change requested

**Solution:** The system configuration change has failed. Confirm the operation and try again. To clear the error, enter ThinkPad Setup.

- **Message:** 0199: System Security - Security password retry count exceeded.

**Solution:** This message is displayed if you enter a wrong supervisor password more than three times. Confirm the supervisor password and try again. To clear the error, enter ThinkPad Setup.

- **Message:** 0270: Real Time Clock Error.

**Solution:** System Real Time Clock is not functional. Have the computer serviced.

- **Message:** 0271: Check Date and Time settings.

**Solution:** The date or the time is not set in the computer. Enter ThinkPad Setup and set the date and time.

- **Message:** 1802: Unauthorized network card is plugged in - Power off and remove the network card.  
**Solution:** The wireless network card is not supported on this computer. Remove it.
- **Message:** 1820: More than one external fingerprint readers are attached.  
**Solution:** Turn off and remove all but the reader that you set up within your main operating system.
- **Message:** 2100: Detection error on HDD0 (Main HDD)  
**Solution:** The hard disk drive is not working. Have the hard disk drive serviced.
- **Message:** 2101: Detection error on SSD1 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2102: Detection error on SSD2 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2110: Read error on HDD0 (Main HDD)  
**Solution:** The hard disk drive is not working. Have the hard disk drive serviced.
- **Message:** 2111: Read error on SSD1 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2112: Read error on SSD2 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2200: Machine Type and Serial Number are invalid.  
**Solution:** Machine Type and Serial Number are invalid. Have the computer serviced.
- **Message:** 2201: Machine UUID is invalid.  
**Solution:** Machine UUID is invalid. Have the computer serviced.
- **Message:** Fan error  
**Solution:** Cooling fan has failed. Shut down the computer immediately and have the computer serviced.
- **Message:** Thermal sensing error  
**Solution:** The thermal sensor has a problem. Shut down the computer immediately and have the computer serviced.
- **Message:** Bottom cover tamper detection error  
**Solution:** The bottom cover tamper switch is not working. Have the computer serviced.
- **Message:** Error: The non-volatile system UEFI variable storage is nearly full.

**Note:** This error indicates that the operating system or programs cannot create, modify, or delete data in the non-volatile system UEFI variable storage due to insufficient storage space after POST.

The non-volatile system UEFI variable storage is used by the UEFI BIOS and by the operating system or programs. This error occurs when the operating system or programs store large amounts of data in the variable storage. All data needed for POST, such as BIOS setup settings, chipset, or platform configuration data, are stored in a separate UEFI variable storage.

**Solution:** Press F1 after the error message is displayed to enter ThinkPad Setup. A dialog asks the user for confirmation to clean up the storage. If the user selects "Yes", all data that were created by the operating system or programs will be deleted except global variables defined by the Unified Extensible Firmware Interface Specification. If the user selects "No", all data will be kept, but the operating system or programs will not be able to create, modify, or delete data in the storage.

If this error happens at a service center, Lenovo authorized service personnel will clean up the non-volatile system UEFI variable storage using the preceding solution.

## Beep errors

Lenovo SmartBeep technology enables you to decode beep errors with your smartphone when a black screen occurs with beeps from your computer. To decode the beep error with Lenovo SmartBeep technology, do the following:

1. Go to <https://support.lenovo.com/smartbeep> or scan the following QR Code.



2. Download the proper diagnostic app and install it on your smartphone.
3. Run the diagnostic app and place the smartphone near the computer.
4. Press the Fn key on your computer to emit the beep again. The diagnostic app decodes the beep error and shows possible solutions on the smartphone.

The following section describes some beep errors and the corresponding solutions.

**Note:** Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center or product documentation. Only use a Lenovo-authorized service provider to repair your product.

Error codes	Solutions
0001: Reset error (platform reset not de-asserted)	<ol style="list-style-type: none"><li>1. Remove all power resources (the ac power adapter, removable battery, and coin-cell battery). If your computer has a built-in battery, reset the computer by inserting a straightened paper clip into the emergency-reset hole. Wait for one minute. Then reconnect all power resources.</li><li>2. Replace the system board (service provider only).</li></ol>
0002: Internal bus error	Replace the system board (service provider only).
0281: General embedded controller error	Replace the system board (service provider only).
0282: Memory module error	<ol style="list-style-type: none"><li>1. Reinstall or replace the memory module.</li><li>2. Replace the system board (service provider only).</li></ol>
0283: PCI resource error	<ol style="list-style-type: none"><li>1. Remove PCIe devices (the M.2 card, PCIe card, and so on) (service provider only).</li><li>2. Replace the system board (service provider only).</li></ol>
0284: TCG-compliant functionality-related error (might be the BIOS code validation failure)	Replace the system board (service provider only).
0285: TCG-compliant functionality-related error (might be the TPM initialization failure)	Replace the system board (service provider only).
0286: Integrated graphics error	Replace the system board (service provider only).



Error codes	Solutions
0287: Discrete graphics error	<ol style="list-style-type: none"> <li>1. Reinstall or replace the discrete graphics card (service provider only).</li> <li>2. Replace the system board (service provider only).</li> </ol>
0288: Computer display error	<ol style="list-style-type: none"> <li>1. Reconnect the display cable on both the system board side and the computer display side (service provider only).</li> <li>2. Replace the system board (service provider only).</li> </ol>

## Memory module problems

Print these instructions now and keep them with your computer for reference later.

**Problem:** My memory module is not operating properly.

**Solution:** Check the following items:

1. Verify that the memory module is installed and seated correctly in your computer.  
Remove all added memory modules to test the computer with only the factory-installed memory modules, and then reinstall the memory module one at a time to ensure a proper connection.
2. Check for error messages during startup.  
Follow the appropriate corrective actions for power-on self-test (POST) error messages.
3. Verify that the latest UEFI BIOS for your model has been installed.
4. Verify the proper memory configuration and compatibility including the maximum memory size and the memory speed.
5. Run diagnostic programs. See "Diagnosing problems with Lenovo Companion" on page 77.

## Ethernet problems

- **Problem:** My computer cannot connect to the network.

**Solution:**

Ensure that:

- The cable is installed correctly.  
The network cable must be securely connected both to the Ethernet connector of your computer and to the RJ45 connector of the hub. The maximum allowable distance from the computer to hub is 100 m (328 ft). If the cable is connected and the distance is within the acceptable limits but the problem persists, try a different cable.
- You are using the correct device driver. To install the correct driver, do the following:
  1. Go to Control Panel, and ensure that you view Control Panel by Category.
  2. Click **Hardware and Sound** → **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
  3. Double-click **Network adapters** to view all network adapters. If an exclamation mark ! is displayed next to the adapter name, you might not be using the correct driver or the driver might have been disabled.
  4. Right-click the highlighted adapter, click **Update driver**, and then follow the instructions on the screen to update the driver.
- The switch port and the adapter have the same duplex setting.

If you configured the adapter for full duplex, ensure that the switch port also is configured for full duplex. Setting a wrong duplex mode can degrade performance, cause data loss, or result in lost connections.

- You have installed all networking software that is necessary for your network environment. Check with your LAN administrator for the necessary networking software.

- **Problem:** The adapter stops working for no apparent reason.

**Solution:** The network driver files might be corrupt or missing.

- **Problem:** My computer is a Gigabit Ethernet model and I use a speed of 1000 Mbps, the connection fails or errors occur.

**Solution:**

- Use Category 5 wiring and ensure that the network cable is securely connected.
- Connect to a 1000 BASE-T hub/switch (not 1000 BASE-X).

- **Problem:** The Wake on LAN feature is not working.

**Solution:** Ensure that Wake on LAN is enabled in ThinkPad Setup. If it is, check with your LAN administrator for the necessary settings.

- **Problem:** My computer is a Gigabit Ethernet model, but it cannot connect to the network at 1000 Mbps. Instead, it connects at 100 Mbps.

**Solution:**

- Try another Ethernet cable.
- Ensure that the link partner is set to auto-negotiate.
- Ensure that the switch is 802.3ab-compliant (gigabit over copper).

## Wireless-LAN problem

**Problem:** I cannot connect to the network using the built-in wireless network card.

**Solution:** Ensure that:

- The Airplane mode is off.
- Your wireless-LAN driver is the latest version.
- Your computer is within the range of a wireless access point.
- The wireless radio is enabled.

## Wireless-WAN problem

**Problem:** A message is displayed indicating that an unauthorized WAN card is installed.

**Solution:** The WAN card is not supported on this computer. Remove the WAN card. For more information, see "Replacing a wireless-WAN card" on page 114.

**Note:** Some models do not have a wireless-WAN card.

## Bluetooth problem

**Note:** Check your connection anytime and ensure that no other Bluetooth-enabled device is searching for the device to which you want to connect. Simultaneous searching is not allowed in the Bluetooth connection.

**Problem:** Sound does not come from the Bluetooth headset/headphones but comes from the local speaker even though the Bluetooth headset/headphones is connected using a Headset profile or AV profile.

**Solution:** Do the following:

1. Exit the program that uses the sound device (for example, Windows Media Player).
2. Go to Control Panel, and ensure that you view Control Panel by Category.
3. Click **Hardware and Sound** → **Sound** → **Playback**.
4. If you are using a Headset profile, select **Bluetooth Hands-free Audio** and click **Set Default**. If you are using an AV profile, select **Stereo Audio** and click **Set Default**.
5. Click **OK** to close the Sound window.

## ThinkPad pointing device problems

- **Problem:** The pointer drifts when the computer is turned on or after it resumes normal operation.

**Solution:** The pointer might drift when you are not using the TrackPoint pointing device during normal operation. This is a normal characteristic of the TrackPoint pointing device and is not a defect. Pointer drifting might occur for several seconds under the following conditions:

- When the computer is turned on
- When the computer resumes normal operation
- When the TrackPoint pointing device is kept pressed for a long time
- When the temperature changes

- **Problem:** The TrackPoint pointing device or trackpad does not work.

**Solution:** Ensure that the TrackPoint pointing device or trackpad is enabled in the Mouse Properties window. For more information, see "Customizing the ThinkPad pointing device" on page 23.

## Keyboard problems

- **Problem:** All or some keys on the keyboard do not work.

**Solution:** If an external numeric keypad is connected:

1. Turn off the computer.
2. Remove the external numeric keypad.
3. Turn on the computer and try using the keyboard again.

If the keyboard problem is resolved, carefully reconnect the external numeric keypad.

If the problem persists, ensure that the correct device driver is installed by doing the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Keyboard**.
3. Click the **Hardware** tab. In the **Device Properties** section, ensure that you see this message: Device Status: This device is working properly.

If keys on the keyboard still do not work, have the computer serviced.

- **Problem:** All or some keys on the external numeric keypad do not work.

**Solution:** Ensure that the external numeric keypad is correctly connected to the computer.

- **Problem:** The keys on the top row of the numeric keypad might not function the same as the icon printed on each key.

**Solution:** Do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Keyboard**. In the Keyboard Properties window, click the **Fn and function keys** tab.

**Note:** If the **Fn and function keys** tab is not displayed, connect your computer to the internet. Then download and install the ThinkPad Hotkey Features program from the Lenovo Support Web site. For more information, see "Installing device drivers" on page 60.

3. In the **How to use Fn key combinations** section, select your preferred option.
4. If you select **Fn sticky method**, press Fn to reset the Fn sticky status.
5. Try to press keys on the top row of the numeric keypad again to check if the problem is resolved.

## Computer screen problems

- **Problem:** My screen keeps blanking when I do not want it to.

**Solution:** Do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound → Power Options**.
3. Show the additional plans, and then select **High performance**.

- **Problem:** When I turn on the computer, nothing is displayed on the screen and the computer does not beep while starting up.

**Note:** If you are not sure whether you heard any beeps, turn off the computer by pressing and holding the power button for four seconds or more. Then turn on the computer and listen again.

**Solution:** Ensure that:

- The battery is installed correctly.
- The ac power adapter is connected to the computer and the power cord is plugged into a working electrical outlet.
- The computer is turned on. (Press the power button again for confirmation.)
- The brightness level of the screen is appropriately set.

If a power-on password is set, press any key to display the prompt for the power-on password and then type the correct password and press Enter.

If these items are correctly set, and the screen remains blank, have the computer serviced.

- **Problem:** When I turn on the computer, only a white cursor is displayed on a blank screen.

**Solution:** If you have modified a partition on your hard disk drive by using partition software, information about that partition, or the master boot record might have been destroyed.

Do the following to try to solve the problem:

1. Turn off the computer, and then turn it on again.
2. If you still see only the cursor on the screen, do the following:
  - If you have used partition software, examine the partition on the hard disk drive by using the software, and recover the partition if required.
  - Use the recovery solutions to restore the system to the factory default state. For more information, see Chapter 8 "Recovery information" on page 95.

If the problem persists, have the computer serviced.



- **Problem:** The screen goes blank while the computer is on.

**Solution:** Your screen saver or power management might have been enabled. Do one of the following:

- Touch the TrackPoint pointing device or the trackpad, or press a key to exit the screen saver.
- Press the power button to resume the computer from sleep or hibernation mode.

- **Problem:** The screen is blank.

**Solution:** Do the following:

1. Press the display-mode switching key  to bring up the image.
2. If you are using the ac power adapter, or using the battery and the battery gauge shows that the battery is not depleted, press the brightness-up key  to make the screen brighter.
3. If your computer is in sleep mode, press Fn to resume the computer from sleep mode.
4. If the problem persists, follow the solution for the following problem.

- **Problem:** The screen is unreadable or distorted.

**Solution:** Ensure that:

- The display device driver is installed correctly.
- The screen resolution and color quality are correctly set.
- The monitor type is correct.

To check these settings, do the following:

1. Right-click on the desktop, and then click **Display settings → Display**.

**Note:** If your computer cannot detect the external monitor, click **Detect** in the Display window.

2. Select the external monitor and set **Resolution**.
3. Click **Display adapter properties**.
4. Click the **Monitor** tab. Check the monitor information to make sure that the monitor type is correct. If it is, click **OK** to close the window; otherwise proceed with the following steps.
5. If more than two monitor types are displayed, select **Generic PnP Monitor** or **Generic Non-PnP Monitor**.
6. Click **Properties**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
7. Click the **Driver** tab.
8. Click **Update Driver**.
9. Click **Browse my computer for driver software**, and then click **Let me pick from a list of available drivers on my computer**.
10. Clear the **Show compatible hardware** check box.
11. Select the correct manufacturer and model for the external monitor. If you cannot find your monitor on the list, stop the installation of this driver and use the driver shipped with your monitor.
12. After updating the driver, click **Close**.

- **Problem:** Incorrect characters are displayed on the screen.

**Solution:** Ensure that you install the operating system and program correctly. If the problem persists, have the computer serviced.

- **Problem:** I try to turn off my computer but the screen stays on and I cannot completely turn off my computer.


**Solution:** Press and hold the power button for four seconds or more to turn off the computer.

- **Problem:** Missing, discolored, or bright dots appear on the screen every time I turn on my computer.

**Solution:** This is an intrinsic characteristic of the TFT technology. Your computer display contains multiple thin-film transistors (TFTs). Only a very small number of missing, discolored, or bright dots on the screen might exist all the time.

## External monitor problems

- **Problem:** The external monitor is blank.

**Solution:** To bring up the image, press the display-mode switching key  and select the monitor you want. If the problem persists, do the following:

1. Connect the external monitor to another computer to ensure that it works.
2. Reconnect the external monitor to your computer.
3. See the manual shipped with the external monitor to check the resolutions and refresh rates that are supported.
  - If the external monitor supports the same resolution as the computer display or a higher resolution, view output on the external monitor or on both the external monitor and the computer display.
  - If the external monitor supports a lower resolution than the computer display, view output on the external monitor only. (If you view output on both the computer display and the external monitor, the external monitor screen will be blank or distorted.)

- **Problem:** I cannot set a higher resolution than the present one on my external monitor.

**Solution:** Ensure that the monitor information is correct. If necessary, update the monitor driver.

- **Problem:** The screen is unreadable or distorted.

**Solution:** Ensure that:

- The monitor information is correct and the appropriate monitor type is selected. If necessary, update the monitor driver.
- Ensure that an appropriate refresh rate is selected by doing the following:
  1. Connect the external monitor to the monitor connector, and then connect the monitor to an electrical outlet.
  2. Turn on the external monitor and the computer.
  3. Right-click on the desktop, and then click **Display settings** → **Advanced display settings**.

**Note:** If your computer cannot detect the external monitor, click **Detect** in the Display window.
  4. Click the icon for the appropriate monitor (**Monitor-2** icon is for the external monitor).
  5. Click **Display adapter properties**.
  6. Click the **Monitor** tab.
  7. Select the correct screen refresh rate.

- **Problem:** Wrong characters are displayed on the screen.

**Solution:** Ensure that you follow the correct procedure when installing the operating system and program. If they are installed and configured correctly, but the problem still persists, have the external monitor serviced.

- **Problem:** The Extend desktop function does not work.

**Solution:** Enable the Extend desktop function. See "Using an external display" on page 33.

- **Problem:** I am using the Extend desktop function, but I cannot set a higher resolution or higher refresh rate on the secondary display.

**Solution:** Change the resolution and the color depth to lower settings for the primary display. See "Using an external display" on page 33.

- **Problem:** Display switching does not work.

**Solution:** If you use the Extend desktop function, disable it, and change the display output location. If a DVD movie or a video clip is playing, stop the playback, close the program, and then change the display output location.

- **Problem:** The screen position on the external monitor is incorrect when that monitor is set for a high resolution.

**Solution:** Sometimes, when you use a high resolution pixels, the image is shifted to the left or right on the screen. To correct this, first ensure that your external monitor supports the display mode (the resolution and the refresh rate) that you have set. If it does not, set a display mode that the monitor supports. If it does support the display mode you have set, go to the setup menu for the monitor itself and adjust the settings there. Usually the external monitor has buttons for access to the setup menu. For more information, see the documentation that comes with the monitor.

## Audio problems

- **Problem:** Wave or MIDI sound does not play properly.

**Solution:** Ensure that the built-in audio device is configured correctly.

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. Double-click **Sound, video and game controllers**.
5. Ensure that the device following **Sound, video and game controllers** is enabled and configured correctly.

- **Problem:** Recordings made by using the microphone input are not loud enough.

**Solution:** Ensure that the Microphone Boost function is turned on and set by doing the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click **Sound**.
4. Click the **Recording** tab in the Sound window.
5. Select **Internal Microphone**, and click **Properties**.
6. Click the **Levels** tab, and move the Microphone Boost slider upwards.
7. Click **OK**.

**Note:** For more information about controlling volume, see your Windows online help.

- **Problem:** I cannot move the volume slider or balance slider.

**Solution:** The slider might be grayed out. This means that its position is fixed by the hardware and cannot be changed.

- **Problem:** The volume sliders do not stay in place when some audio programs are used.

**Solution:** It is normal for the sliders to change position when certain sound programs are used. The programs are aware of the settings in the Volume Mixer window and are enabled to change the settings themselves. An example is the Windows Media Player program. Usually the program has sliders available to control the sound from within the program.

- **Problem:** The balance slider cannot completely mute one channel.

**Solution:** The control is designed to compensate for minor differences in balance and does not completely mute either channel.

- **Problem:** There is no volume control for MIDI sound in the Volume Mixer window.

**Solution:** Use the hardware volume control. This is because the built-in synthesizer software does not support the control.

- **Problem:** The sound cannot be turned off even if I set the Master volume control at minimum.

**Solution:** You still can hear some sound even though you have set the Master volume control at minimum. To turn off the sound completely, go to the Master volume control and select **Mute Speaker/HP**.

- **Problem:** When I connect headphones to my computer while playing sound, a speaker does not produce sound.

**Solution:** When the headphones are attached, the streaming is automatically redirected to it. If you want to listen to sound from the speakers again, ensure that you set those speakers as the default device. For more information, see the help information system for Realtek HD Audio Manager.

- **Problem:** Sound does not come from a headphone or a speaker, or the computer cannot record sounds.

**Solution:** To switch from one device to another (for example, from a speaker to a headphone, or from an external microphone to a built-in microphone), do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click the **SmartAudio** icon.
4. Ensure that the computer is in MULTI-STREAM mode in the Device advanced settings window.
5. In the Volume Mixer window, select the device you want, for example, speakers.
6. Play any sound through a music program (for example, Windows Media Player). Ensure that sound comes from the speakers now.
7. Then, if you would like to switch to a headphone, close the music program.
8. Go to the Volume Mixer window. Then select another device (for example, the headphone).
9. Play any sound through the music program. Ensure that sound comes from the headphone attached directly to the system. For more information, see the help information system of the SmartAudio program.

**Note:** The Volume Mixer window of **SmartAudio** displays all audio devices detected in the system, such as speakers for a playback device, or a built-in microphone for a recording device. A check mark beside the audio device shows that the device has been selected.

## Fingerprint reader problems

- **Problem:** The surface of the reader is dirty, stained, or wet.

**Solution:** Gently clean the surface of the reader with a dry, soft, lint-free cloth.

- **Problem:** The reader often fails to enroll or authenticate your fingerprint.

**Solution:** If the surface of the reader is dirty, stained, or wet, gently clean the surface of the reader with a dry, soft, lint-free cloth.

For tips on how to maintain the fingerprint reader, see "Using the fingerprint reader" on page 54.

## Battery problems

- **Problem:** The battery cannot be fully charged in the standard charge time when the computer is powered off.

**Solution:** The battery might be over-discharged. Do the following:

1. Turn off the computer.
2. Ensure that the over-discharged battery is in the computer.
3. Connect the ac power adapter to the computer and let it charge.

If a quick charger is available, use it to charge the over-discharged battery.

If the battery cannot be fully charged in 24 hours, use a new battery.

- **Problem:** The computer shuts down before the battery status icon shows that the battery is empty.



**Solution:** Discharge and recharge the battery.

- **Problem:** The computer operates after the battery status icon shows that the battery is empty.

**Solution:** Discharge and recharge the battery.

- **Problem:** The operating time for a fully charged battery is short.

**Solution:** Discharge and recharge the battery. If your battery operating time is still short, use a new battery.

- **Problem:** The computer does not operate with a fully charged battery.

**Solution:** The surge protector in the battery might be active. Turn off the computer for one minute to reset the protector; then turn on the computer again.

- **Problem:** The battery cannot get charged.

**Solution:** You cannot charge the battery when it is too hot. If the battery feels hot, remove it from the computer and wait for a while to let it cool to room temperature. After it cools, reinstall it and recharge the battery. If it still cannot be charged, have it serviced.

## ac power adapter problem

**Problem:** The ac power adapter is connected to the computer and the working electrical outlet, but the power adapter (power plug) icon is not displayed in the Windows notification area. The ac power indicator also does not light up.

**Solution:** Do the following:

1. Ensure that the connection of the ac power adapter is correct. For instructions on how to connect the ac power adapter, see *Using the ac power adapter*.
2. If the connection of the ac power adapter is correct, turn off the computer, and then disconnect the ac power adapter and remove the removable battery.
3. Reinstall the battery and reconnect the ac power adapter, and then turn on the computer.
4. If the power adapter icon still is not displayed in the Windows notification area, have the ac power adapter and your computer serviced.

## Power problems

**Print these instructions now and keep them with your computer for reference later.**

- **Problem:** My computer is getting no power at all.

**Solution:** Check the following items:

1. Verify the power button. The power button is illuminated whenever the computer is on.
2. Check all power connections. Remove any power strips and surge protectors to connect the ac power adapter directly to the ac power outlet.
3. Inspect the ac power adapter. Check for any physical damage, and ensure that the power cable is firmly attached to the adapter brick and the computer.
4. Verify that the ac power source is working by attaching another device to the outlet.

- **Problem:** My computer does not run on battery power.

**Solution:** Check the following items:

1. Remove and reinstall the removable battery to ensure that it is properly connected.
2. If the battery runs out of power, attach the ac power adapter to recharge the battery.
3. If the battery is charged but the computer does not run, replace the battery with a new one.

- **Problem:** The system does not respond, and I cannot turn off the computer.

**Solution:** Turn off the computer by pressing and holding the power button for four seconds or more. If the computer still does not respond, remove the ac power adapter and the battery.

## Power button problem

**Problem:** The system does not respond, and I cannot turn off the computer.


**Solution:** Turn off the computer by pressing and holding the power button for four seconds or more. If the system still does not respond, remove the ac power adapter and reset the system by inserting one end of a needle or a straightened paper clip into the emergency-reset hole. To locate the emergency-reset hole, see "Bottom view" on page 5.

## Boot problems

Print these instructions now and keep them with your computer for reference later.

- **Problem:** I receive an error message before the operating system loads.  
**Solution:** Follow the appropriate corrective actions for power-on self-test (POST) error messages.
- **Problem:** I receive an error message while the operating system is loading the desktop configuration after the POST is completed.  
**Solution:** Find solutions by searching for the error message at the following Web sites:
  - <http://www.lenovo.com/support>
  - <https://support.microsoft.com/>

## Sleep and hibernation problems

- **Problem:** The computer enters sleep mode unexpectedly.  
**Solution:** If the microprocessor overheats, the computer automatically enters sleep mode to allow the computer to cool and to protect the microprocessor and other internal components. Check the settings for sleep mode.
- **Problem:** The computer enters sleep mode immediately after the power-on self-test.  
**Solution:** Ensure that:
  - The battery is charged.
  - The operating temperature is within the acceptable range. See "Operating environment" on page 12.If the problem persists, have the computer serviced.
- **Problem:** A critical low-battery error occurs, and the computer immediately turns off.  
**Solution:** The battery power is getting low. Plug the ac power adapter into an electrical outlet and then into the computer. Alternatively, replace the battery with a charged one.
- **Problem:** The computer display remains blank after you press Fn to resume from sleep mode.  
**Solution:** Check whether an external monitor was disconnected or turned off while the computer was in sleep mode. If you disconnected or turned off the external monitor, connect it or turn it on before resuming the computer from sleep mode. When resuming the computer from sleep mode without attaching the external monitor or turning it on, and the computer display remains blank, press the display-mode switching key  to bring up the computer display.
- **Problem:** The computer does not resume from sleep mode, or the system status indicator blinks slowly and the computer does not work.  
**Solution:** If the system does not resume from sleep mode, it might have entered sleep or hibernation mode automatically because the battery is depleted. Check the system status indicator.

- If the system status indicator blinks slowly, your computer is in sleep mode. Connect the ac power adapter to the computer; then press Fn.
- If the system status indicator is off, your computer has no power or is in hibernation mode. Connect the ac power adapter to the computer; then press the power button to resume operation.

If the system still does not resume from sleep mode, your system might stop responding and you might not be able to turn off the computer. In this case, you must reset the computer. If you have not saved your data, it might be lost. To reset the computer, press and hold the power button for four seconds or more. If the system still does not respond, remove the ac power adapter and the battery.

- **Problem:** Your computer does not enter sleep or hibernation mode.

**Solution:** Check whether any option has been selected to disable your computer from entering sleep or hibernation mode.

If your computer tries to enter sleep mode but the request is rejected, the device attached to the USB connector might have been disabled. If this occurs, do a hot-unplug-and-plug operation for the USB device.

- **Problem:** The battery discharges slightly while the computer is in hibernation mode.

**Solution:** If the wakeup function is enabled, the computer consumes a small amount of power. This is not a defect. For more information, see "Power-saving modes" on page 26.

## Hard disk drive problems

- **Problem:** The hard disk drive makes a rattling noise intermittently.

**Solution:** The rattling noise might be heard:

- When the hard disk drive begins or finishes getting access to data
- When you carry the hard disk drive
- When you carry your computer

This is a normal characteristic of a hard disk drive and is not a defect.

- **Problem:** The hard disk drive does not work.

**Solution:** On the **Startup** menu of ThinkPad Setup, ensure that the hard disk drive is on the **Boot priority order** list. If it is on the **Excluded from boot order** list, it is disabled. Select the entry for it on the list and press Shift+F1 to move it back to the **Boot priority order** list.

- **Problem:** After I have set a hard disk password, I move the hard disk drive to another computer but cannot unlock the hard disk password on the new computer.

**Solution:** Your computer supports an enhanced password algorithm. Computers older than yours might not support such a security function.

## Solid-state drive problem

**Problem:** When you compress files or folders by use of the data compression function in the Windows operating system, and then decompress them, the process of writing to or reading from the files or folders is slow.

**Solution:** Apply the disk defragmentation tool in the Windows operating system for faster access to the data.

## Software problem

**Problem:** A program does not run properly.

**Solution:** Ensure that the problem is not being caused by the program.

Check that your computer has the minimum required memory to run the program. See the manuals supplied with the program.

Check the following:

- The program is designed to operate with your operating system.
- Other programs run properly on your computer.
- The necessary device drivers are installed.
- The program works when it is run on some other computer.

If an error message is displayed while you are using the program, see the manuals or help system supplied with the program.

If the program still does not run properly, contact your place of purchase or a service representative for help.

## USB problem

**Problem:** A device connected to the USB connector does not work.

**Solution:** Ensure that the USB port is enabled in the ThinkPad Setup. Open the Device Manager window. Ensure that the USB device setup is correct, and that the assignment of computer resource and the installation of the device driver are correct. To open the Device Manager window, go to Control Panel and ensure that you view Control Panel by Category, and click **Hardware and Sound → Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

Refer to "Diagnosing problems with Lenovo Companion" on page 77 and run a diagnostic test of the USB connector.

## Docking station problem

**Problem:** The computer does not start when you try to turn it on, and does not respond when you try to resume operation.

**Solution:** Ensure that:

- The ac power adapter is connected to the docking station.
- The computer is securely attached to the docking station.

---

## Chapter 8. Recovery information

This chapter provides information about the Windows recovery solutions on the Windows 10 operating system.

---

### Resetting your computer

If your computer does not perform well, you might consider resetting your computer. In the resetting process, you can choose to keep your files or remove them, and then reinstall the Windows operating system.

To reset your computer, do the following:

**Note:** The items in the graphical user interface (GUI) might change without notice.

1. Open the Start menu, and then click **Settings** → **Update & Security** → **Recovery**.
2. In the **Reset this PC** section, click **Get started**.
3. Follow the instructions on the screen to reset your computer.

---

### Using advanced startup options

The advanced startup options enable you to do the following:

- Change the firmware settings of the computer
- Change the startup settings of the Windows operating system
- Start the computer from an external device
- Restore the Windows operating system from a system image

To use advanced startup options, do the following:

**Note:** The items in the graphical user interface (GUI) might change without notice.

1. Open the Start menu, and then click **Settings** → **Update & security** → **Recovery**.
2. In the **Advanced startup** section, click **Restart now** → **Troubleshoot** → **Advanced options**.
3. Select a startup option you want, and then follow the instructions on the screen.

---

### Recovering your operating system if Windows 10 fails to start

The Windows recovery environment on your computer operates independently from the Windows 10 operating system. It enables you to recover or repair the operating system even if the Windows 10 operating system fails to start.

After two consecutive failed boot attempts, the Windows recovery environment starts automatically. Then you can choose repair and recovery options by following the on-screen instructions.

**Note:** Ensure that your computer is connected to ac power during the recovery process.

---

## Creating and using a recovery USB drive

You can create a recovery USB drive as a backup for the Windows recovery programs. With the recovery USB drive, you can troubleshoot and fix the problems even if the preinstalled Windows recovery programs are damaged.

It is recommended that you create a recovery USB drive as early as possible. If you did not create a recovery USB drive as a precautionary measure, you can contact Lenovo Customer Support Center and purchase one from Lenovo. For a list of the Lenovo Support phone numbers for your country or region, go to:

<http://www.lenovo.com/support/phone>

### Creating a recovery USB drive

To create a recovery USB drive, you need a USB drive with at least 16 GB of storage capacity. The actual USB capacity that is required depends on the size of the recovery image.

**Attention:** The creation process will delete anything stored on the USB drive. To avoid data loss, make a backup copy of all the data that you want to keep.

To create a recovery USB drive, do the following:

**Note:** Ensure that your computer is connected to ac power during the following process.

1. Connect a proper USB drive (at least 16 GB of storage) to the computer.
2. Type `recovery` in the search box on the taskbar. Then click **Create a recovery drive**.
3. Click **Yes** in the User Account Control window to allow the Recovery Media Creator program to start.
4. In the Recovery Drive window, follow the instructions on the screen to create a recovery USB drive.

### Using the recovery USB drive

If you cannot start your computer, refer to the corresponding information in the topic "Troubleshooting" on page 78 to try to solve the problem by yourself. If you still cannot start your computer, use the recovery USB drive to recover your computer.

To use a recovery USB drive, do the following:

**Note:** Ensure that your computer is connected to ac power during the following process.

1. Connect the recovery USB drive to the computer.
2. Turn on or restart the computer. Before the Windows operating system starts, repeatedly press F12. The Boot Menu window opens.
3. Select the recovery USB drive as the boot device.
4. Select a preferred keyboard layout.
5. Click **Troubleshoot** to display optional recovery solutions.
6. Select a corresponding recovery solution according to your situation. Then follow the instructions on the screen to complete the process.

---

## Chapter 9. Replacing devices

This chapter provides instructions on how to install or replace hardware for your computer.

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### Customer Replaceable Units

Customer Replaceable Units (CRUs) are parts that can be upgraded or replaced by the customer. ThinkPad computers contain the following types of CRUs:

- **Self-service CRUs:** Refer to parts that can be installed or replaced easily by customer themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be installed or replaced by customers with a greater skill level. Trained service technicians can also provide service to install or replace the parts under the type of warranty designated for the customer's machine.

If you intend on installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You might be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you might be charged for the replacement CRU if Lenovo does not receive the defective CRU within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation at [http://www.lenovo.com/warranty/llw\\_02](http://www.lenovo.com/warranty/llw_02) for full details.

For the CRU information of your computer, refer to the following list.

**Note:** \* Available on some models

#### Self-service CRUs

- ac power adapter and power cord
- TrackPoint cap
- Removable battery
- Base cover assembly
- Hard disk drive or SATA solid-state drive \*
- Hard disk drive cable or SATA solid-state drive cable \*
- M.2 solid-state drive \*
- M.2 solid-state drive adapter \*
- M.2 solid-state drive cable \*
- Coin-cell battery

#### Optional-service CRUs

- Keyboard
- Memory module
- Wireless LAN card
- Wireless WAN card \*

---

## Static electricity prevention

Static electricity, although harmless to you, can seriously damage computer components and options. Improper handling of static-sensitive parts can cause damage to the part. When you unpack an option or a Customer Replaceable Unit (CRU), do not open the static-protective package until the instructions direct you to install the part.

When you handle options or CRUs, or perform any work inside the computer, take the following precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters, memory modules, and other circuit boards by the edges. Never touch exposed circuitry.
- Prevent others from touching the components.
- Before you install a static-sensitive option or CRU, do either of the following to reduce static electricity in the package and your body:
  - Touch the static-protective package that contains the part to a metal expansion-slot cover for at least two seconds.
  - Touch the static-protective package that contains the part to other unpainted metal surface on the computer for at least two seconds.
- When possible, remove the static-sensitive part from the static-protective package and install the part without setting it down. When this is not possible, place the static-protective package on a smooth, level surface and place the part on the package.
- Do not place the part on the computer cover or other metal surface.

---

## Disabling the built-in battery

Before replacing any CRU, ensure that you disable Fast Startup first and then disable the built-in battery.

To disable Fast Startup, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options**, and then click **Choose what the power buttons do** on the left pane.
3. Click **Change settings that are currently unavailable** at the top.
4. If prompted by User Account Control (UAC), click **Yes**.
5. Clear the **Turn on fast startup** check box, and then click **Save changes**.

To disable the built-in battery, do the following:

1. Restart your computer. When the logo screen is displayed, immediately press F1 to enter ThinkPad Setup.
2. Select **Config** → **Power**. The **Power** submenu is displayed.
3. Select **Disable built-in battery** and press Enter.
4. Select **Yes** in the Setup Confirmation window. The built-in battery is disabled and the computer turns off automatically. Wait three to five minutes to let the computer cool.

---

## Replacing the removable battery

Before you start, read "Important safety information" on page v and print the following instructions.



This system supports only batteries specially designed for this specific system and manufactured by Lenovo or an authorized builder. The system does not support unauthorized batteries or batteries designed for other systems. If an unauthorized battery or a battery designed for another system is installed, the system does not charge and the following message is displayed:

"The battery installed is not supported by this system and will not charge. Replace the battery with the correct Lenovo battery for this system."

**Attention:** Lenovo has no responsibility for the performance or safety of unauthorized batteries, and provides no warranties for failures or damage arising out of their use.



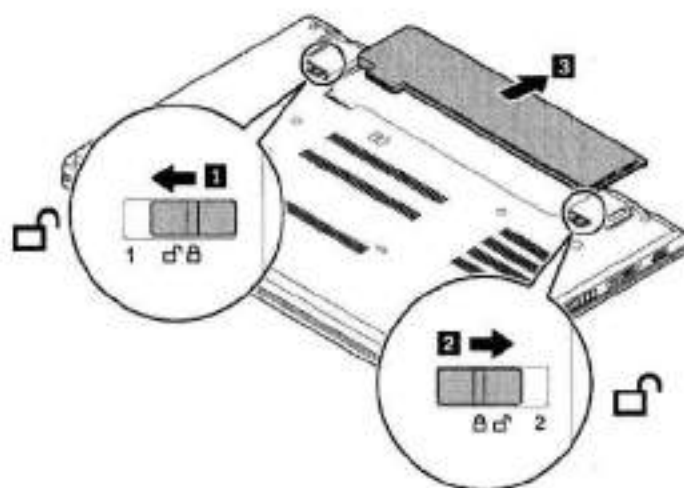
If the rechargeable battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substances. To avoid possible injury:

- Replace only with a battery of the type recommended by Lenovo.
- Keep the battery away from fire.
- Do not expose it to excessive heat.
- Do not expose it to water or rain.
- Do not short-circuit it.
- Do not drop, crush, puncture, or subject to strong forces. Battery abuse or mishandling can cause the battery to overheat, which can cause gasses or flame to "vent" from the battery.

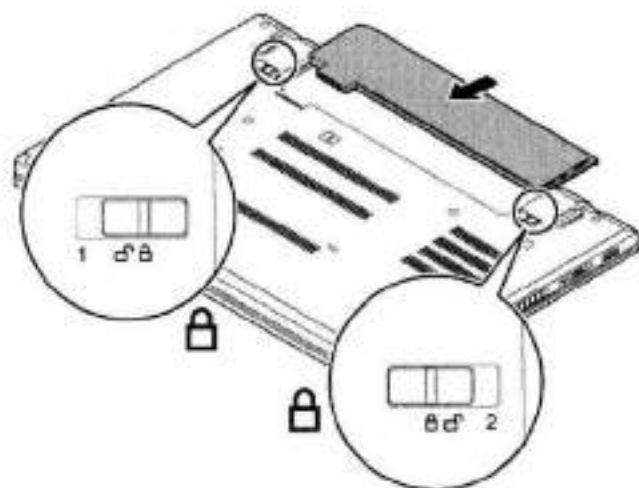
To replace the removable battery, do the following:

**Note:** Depending on the model, your computer might look slightly different from the illustrations in this topic.

1. Disable the built-in battery. See Disabling the built-in battery.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Slide the latches **1** to the unlocked position. Then slide and hold the latch **2**. Remove the battery **3**.



5. Insert a new battery until it clicks into place. Ensure that the latches are in the locked positions.



6. Turn the computer over. Connect the ac power adapter and all cables to the computer.

---

## Replacing the nano-SIM card

Before you start, read "Important safety information" on page v and print the following instructions.

Nano-SIM card is a small plastic card with an Integrated Circuit (IC) chip mounted on one side of the card.

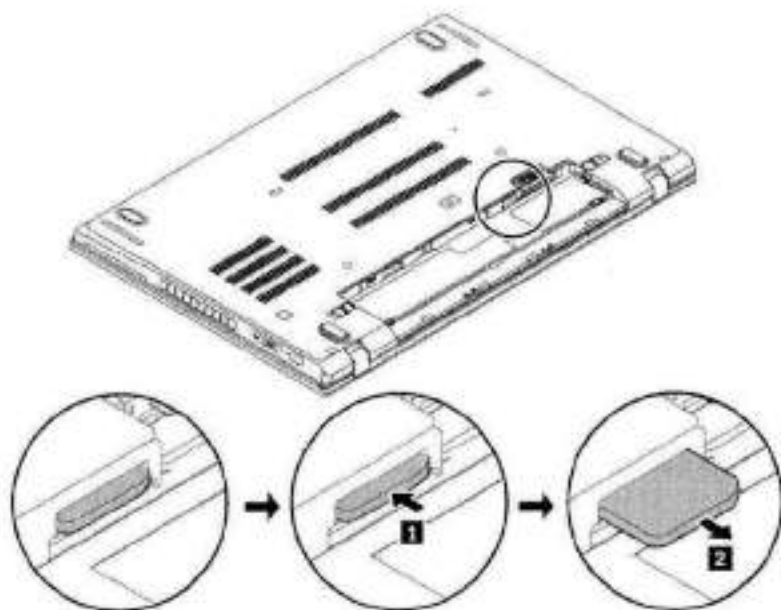
If your computer supports wireless WAN, your computer might require a nano-SIM card to establish wireless WAN connections. Depending on the model, you might need to purchase a nano-SIM card or a nano-SIM card might already be installed in your computer. In some countries or regions, a nano-SIM card is part of the shipping contents that come with your computer.

**Attention:** When installing or removing the nano-SIM card, do not touch the nano-SIM card metal connectors.

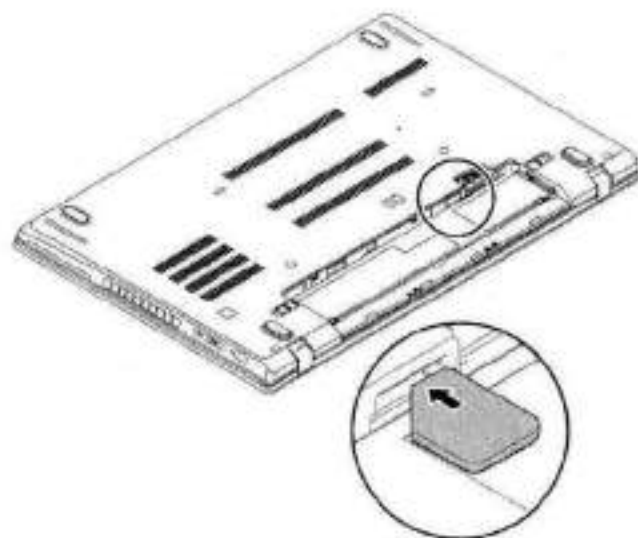
To replace the nano-SIM card, do the following:

1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See ["Replacing the removable battery"](#) on page 98.

5. Gently push the nano-SIM card to eject it , and then slide it out of the slot .



6. Note the orientation of the new nano-SIM card and then insert it into the slot completely until it clicks into position.



7. Reinstall the removable battery.  
8. Turn the computer over. Connect the ac power adapter and all cables to the computer.

---

## Replacing the base cover assembly

Before you start, read "Important safety information" on page v and print the following instructions.

### Notes:

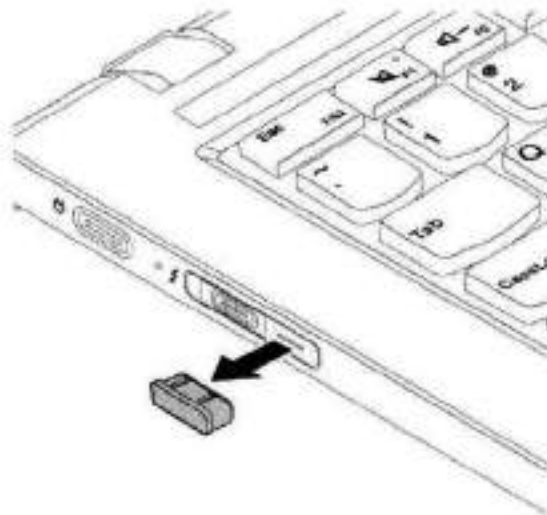
- Depending on the model, your computer might look slightly different from the illustrations in this topic.

- There might be a risk of short circuits if you remove the base cover assembly in the following situations:
  - When your computer has the removable battery installed
  - When your computer is connected to ac power

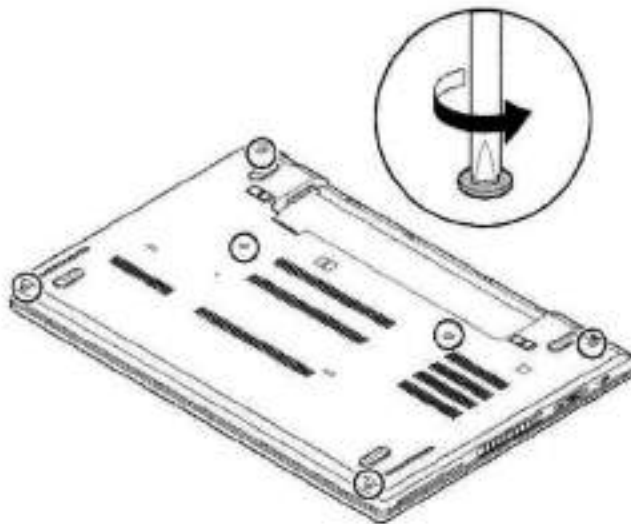
Besides, the computer will not start after you reinstall the base cover assembly. To start the computer, disconnect the ac power adapter and then reconnect it to the computer.

To replace the base cover assembly, do the following:

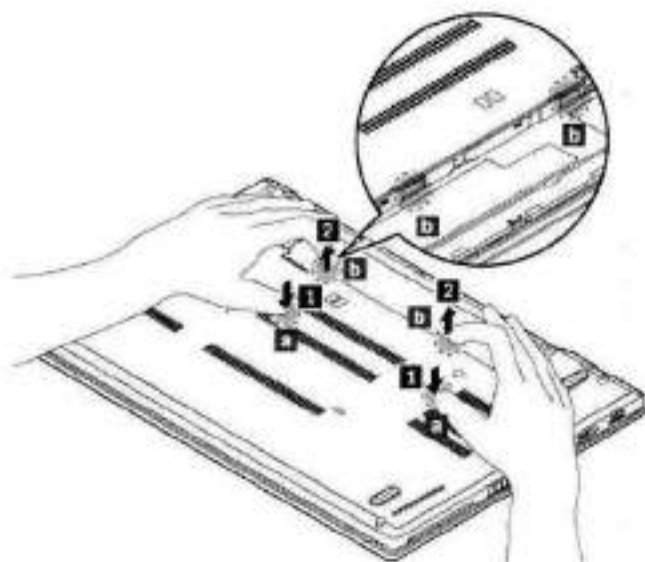
1. Disable the built-in battery. See *Disabling the built-in battery*.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Remove the connector cover as shown.



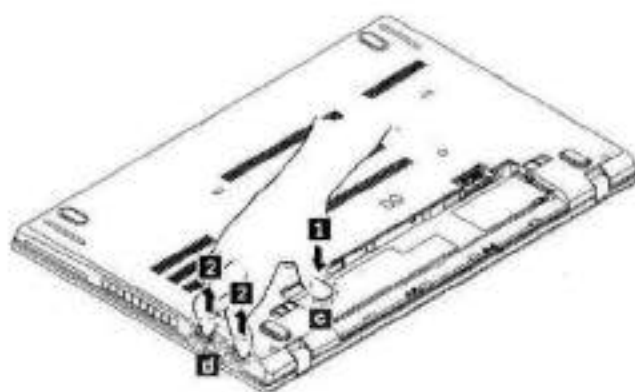
4. Close the computer display and turn the computer over.
5. Remove the removable battery. See *“Replacing the removable battery”* on page 98.
6. Loosen the screws that secure the base cover assembly as shown.



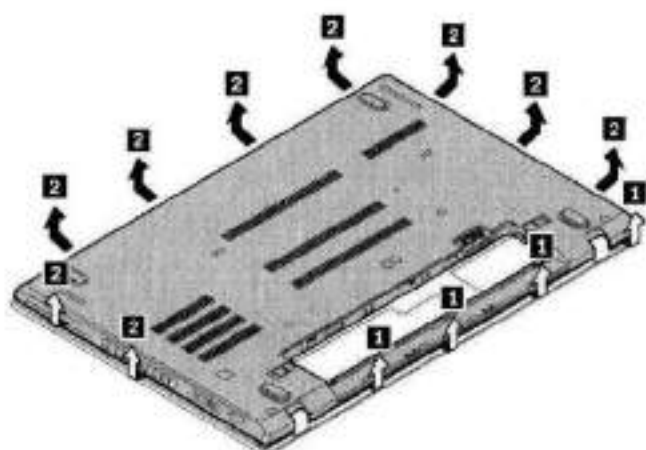
7. Press the locations **a** on the base cover assembly with your thumbs and pivot the hooks **b** upward at the same time to disengage the hooks from the chassis.



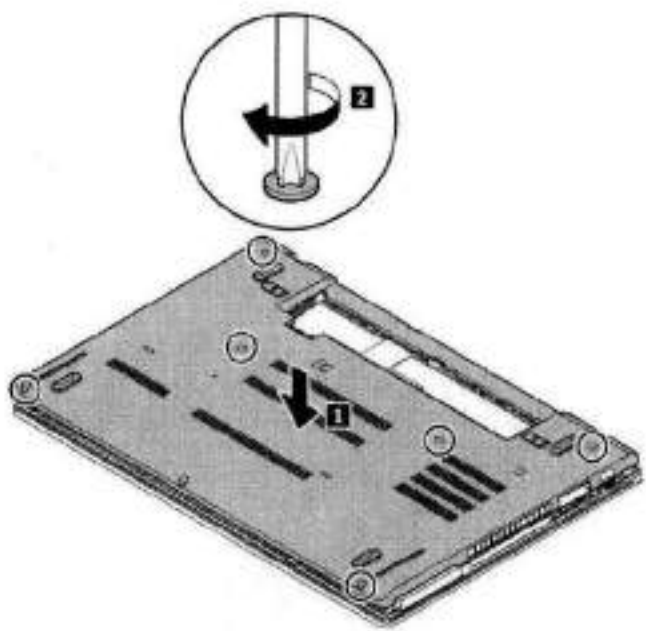
8. Press the location **a** with your thumb and insert your fingers into the holes **b** to pivot this area of the base cover assembly upward as shown. This area of the base cover assembly will be disengaged from the chassis.



9. Remove the base cover assembly in the numeric order as shown.



10. Install the new base cover assembly in place **1**. Ensure that the latches of the base cover assembly are secured under the base cover assembly. Then tighten the screws to secure the base cover assembly **2**.



11. Reinstall the base cover assembly and the removable battery.  
12. Turn the computer over. Connect the ac power adapter and all cables to the computer.

---

## Replacing a memory module

Before you start, read "Important safety information" on page v and print the following instructions.

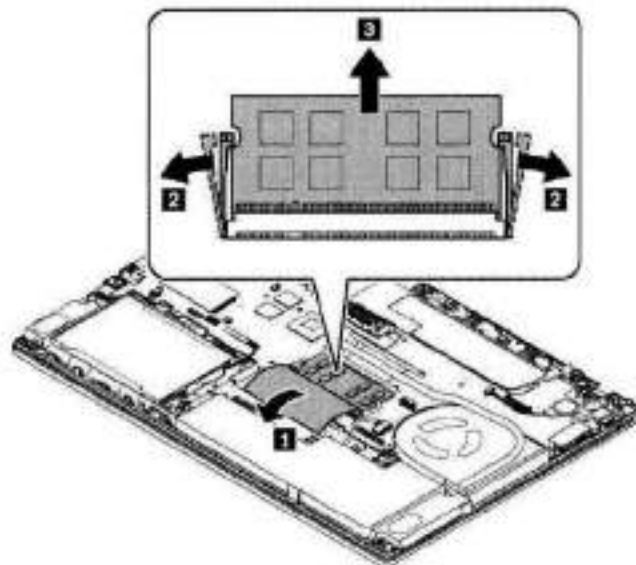
Increasing memory capacity is an effective way to make programs run faster. You can increase memory capacity by replacing or adding a memory module.

**Attention:**

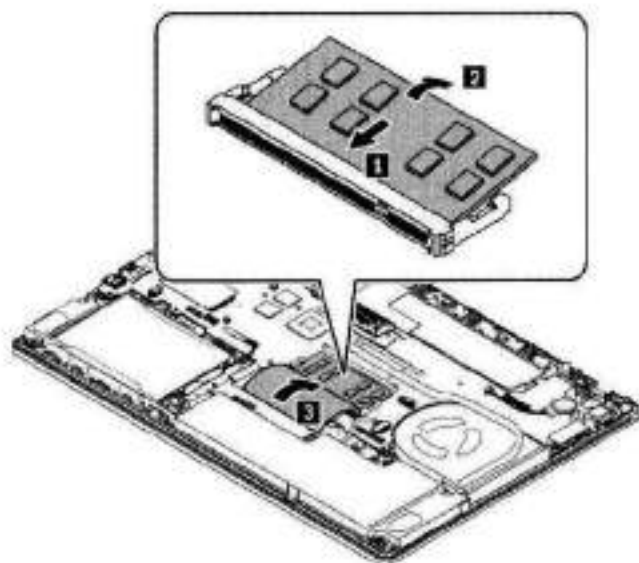
- Before you start the replacement, touch a grounded metal object. This action reduces any static electricity from your body. Static electricity might damage the memory module.
- Do not touch the contact edge of the memory module. Otherwise the memory module might get damaged.

To replace a memory module, do the following:

1. Disable the built-in battery. See *Disabling the built-in battery*.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See *"Replacing the removable battery"* on page 98.
5. Remove the base cover assembly. See *"Replacing the base cover assembly"* on page 101.
6. To remove the memory module, do the following:
  - a. Open the film to access the memory module **1**.
  - b. Open the latches on both sides of the memory slot at the same time **2**.
  - c. Remove the memory module **3**.



7. To install a new memory module, do the following:
  - a. Place the notched end of the new memory module toward the contact edge side of the memory slot. Then insert the memory module into the slot at an angle of about 20 degrees **1**.
  - b. Pivot the memory module downward until it snaps into place **2**. Ensure that the memory module is firmly installed in the slot and cannot be moved easily.
  - c. Close the film to protect the new memory module **3**.



8. Reinstall the base cover assembly and the removable battery.
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

---

## Replacing the internal storage drive

Before you start, read "Important safety information" on page v and print the following instructions.

**Attention:** The internal storage drive (such as hard disk drive, solid-state drive, or hybrid drive) is sensitive. Inappropriate handling might cause damage and permanent loss of data.

When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

**Note:** Depending on your computer model, a 2.5-inch hard disk drive, a 2.5-inch solid-state drive, or an M.2 solid-state drive might come with your computer.

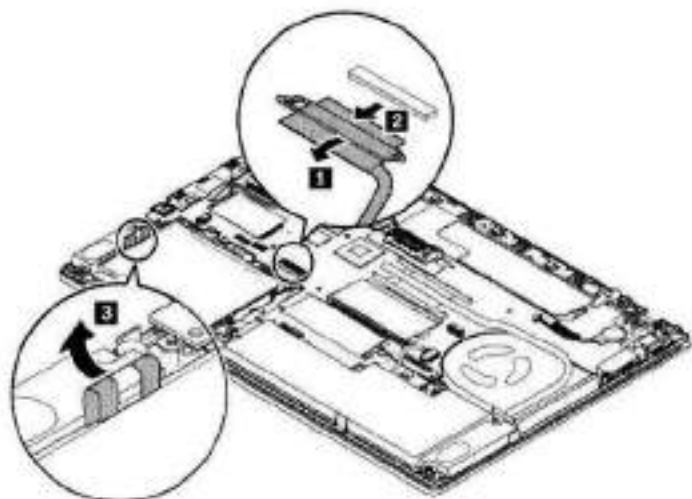
### 2.5-inch storage drive

To remove the 2.5-inch storage drive, do the following:

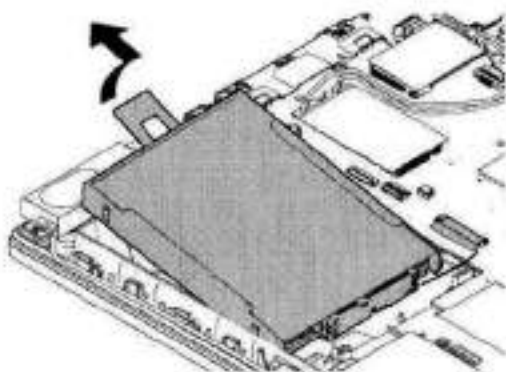
1. Disable the built-in battery. See "Disabling the built-in battery."
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See "Replacing the removable battery" on page 98.
5. Remove the base cover assembly. See "Replacing the base cover assembly" on page 101.



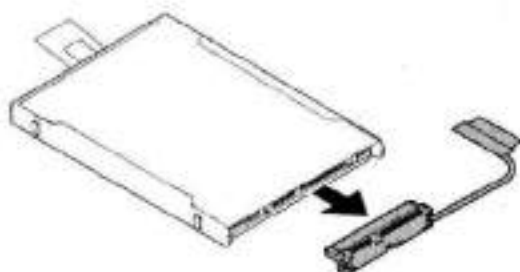
6. Disconnect the cable from the system board **1** **2** and pull out the tape **3**.



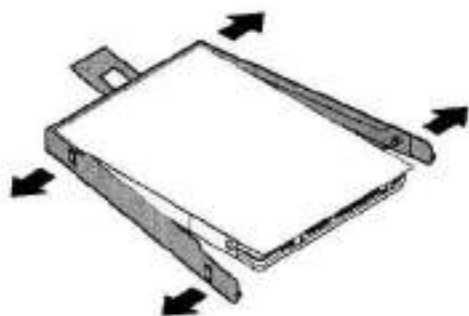
7. Remove the 2.5-inch storage drive by pulling the tape.



8. Disconnect the cable from the 2.5-inch storage drive.

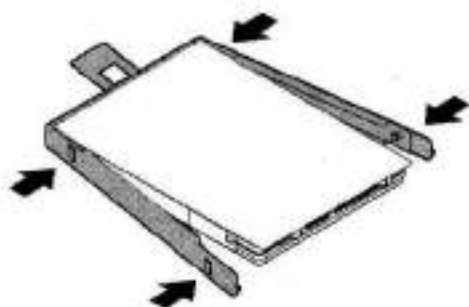


9. Detach the bracket from the 2.5-inch storage drive.



To install the new 2.5-inch storage drive, do the following:

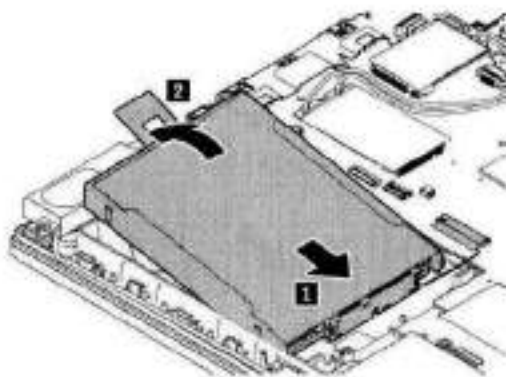
1. Attach the bracket to the new 2.5-inch storage drive.



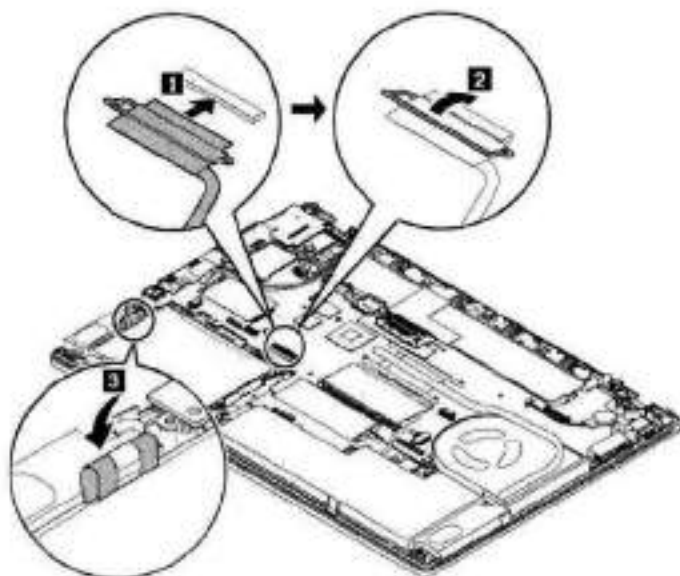
2. Connect the cable to the new 2.5-inch storage drive.



3. Insert the new storage drive **1** and then pivot it downward **2**. Ensure that the new storage drive is seated in place.



4. Connect the cable to the system board **1** **2** and insert the tape **3**.



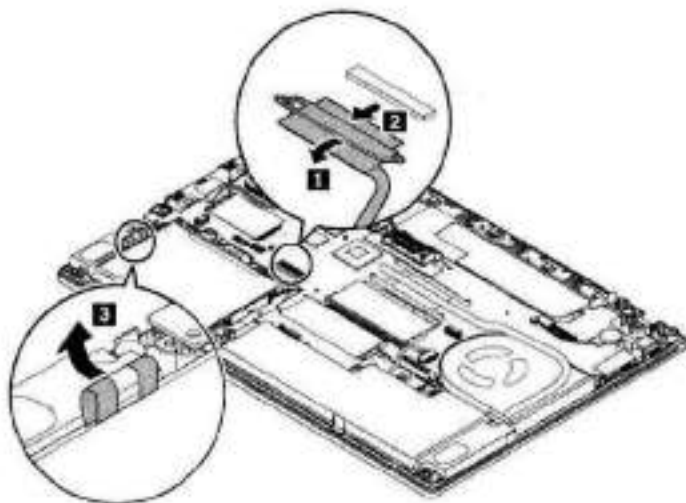
5. Reinstall the base cover assembly and the removable battery.
6. Turn the computer over. Connect the ac power adapter and all cables.

### **M.2 solid-state drive**

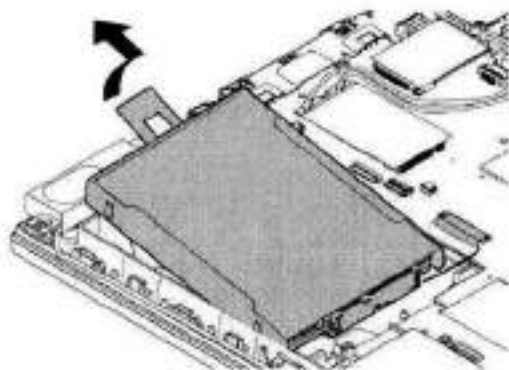
To remove the M.2 solid-state drive, do the following:

1. Disable the built-in battery. See *Disabling the built-in battery*.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See *"Replacing the removable battery"* on page 98.
5. Remove the base cover assembly. See *"Replacing the base cover assembly"* on page 101.

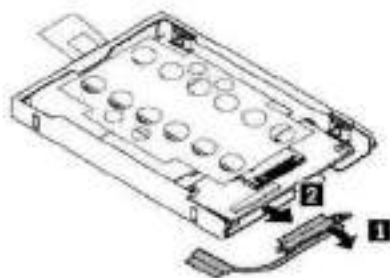
6. Disconnect the cable from the system board **1** and pull out the tape **2**.



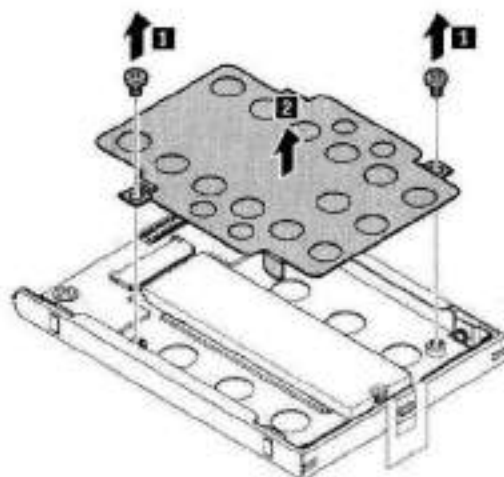
7. Remove the M.2 solid-state-drive adapter by pulling the tape.



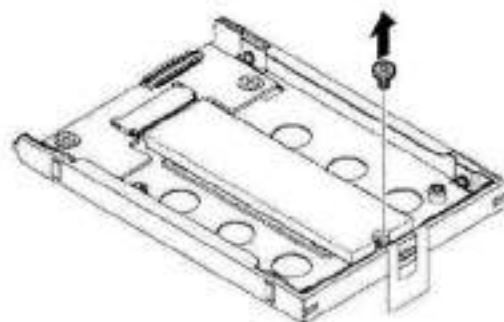
8. If you also want to replace the M.2 solid-state-drive cable, disconnect the cable from the M.2 solid-state-drive adapter.



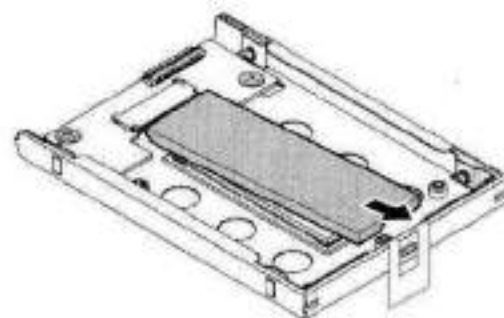
9. Remove the two screws that secure the protective cover **1**, and then remove the cover **2**.



10. Remove the screw that secures the M.2 solid-state drive. The M.2 solid-state drive is released from the secured position and pivots upward.

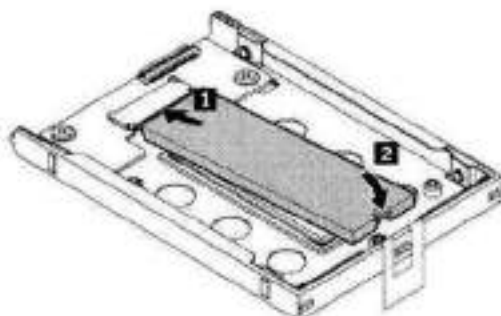


11. Gently pull the M.2 solid-state drive out of the slot.

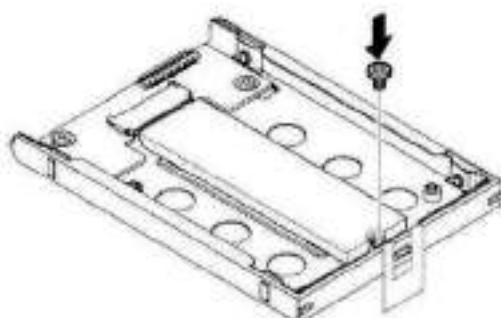


To install the new M.2 solid-state drive, do the following:

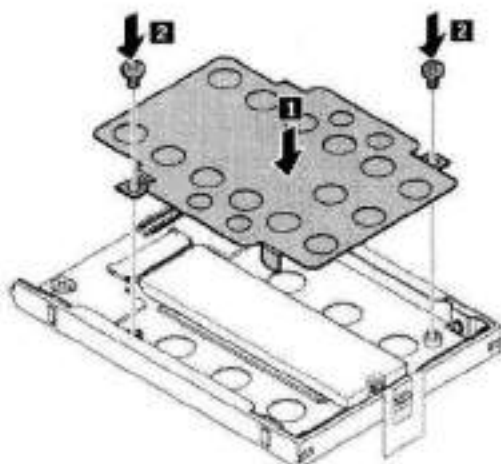
1. Align the notch in the new M.2 solid-state drive with the slot key in the M.2 slot. Insert the solid-state drive into the M.2 slot at an angle of about 20 degrees until it is secured tightly **1** and then pivot it downward **2**.



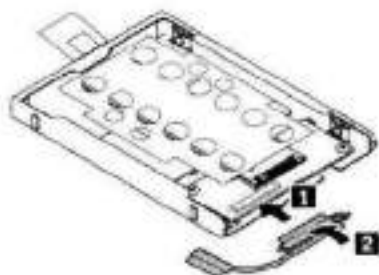
2. Install the screw to secure the M.2 solid-state drive.



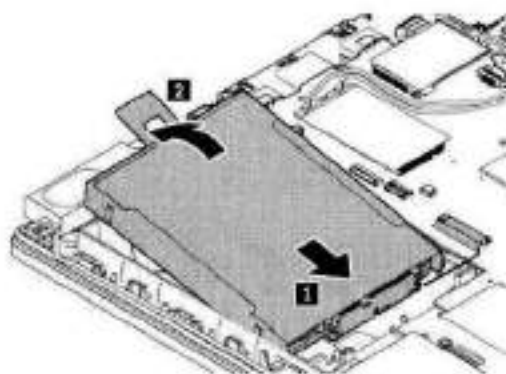
3. Install the protective cover and then install the two screws to secure the cover.



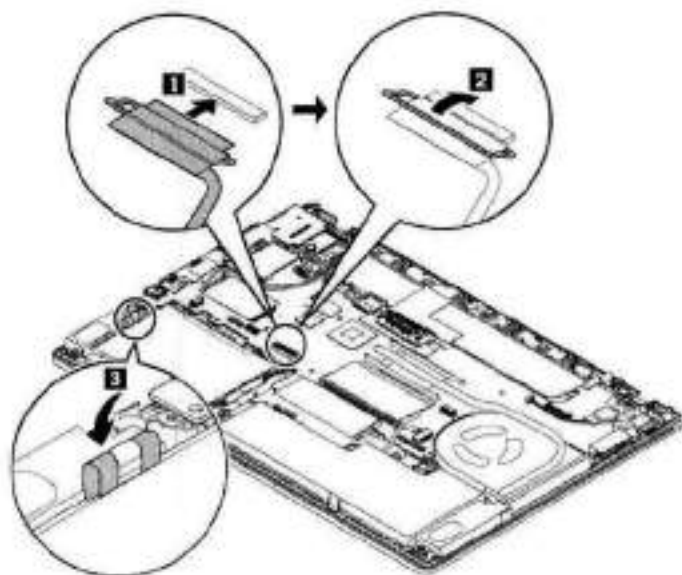
4. If the M.2 solid-state-drive cable has been disconnected, connect the cable to the M.2 solid-state-drive adapter.



5. Insert the adapter **1** and then pivot it downward **2**. Ensure that the adapter is seated in place.



6. Connect the cable to the system board **1** **2** and insert the tape **3**.



7. Reinstall the base cover assembly and the removable battery.
8. Turn the computer over. Connect the ac power adapter and all cables.

## Replacing a wireless-WAN card

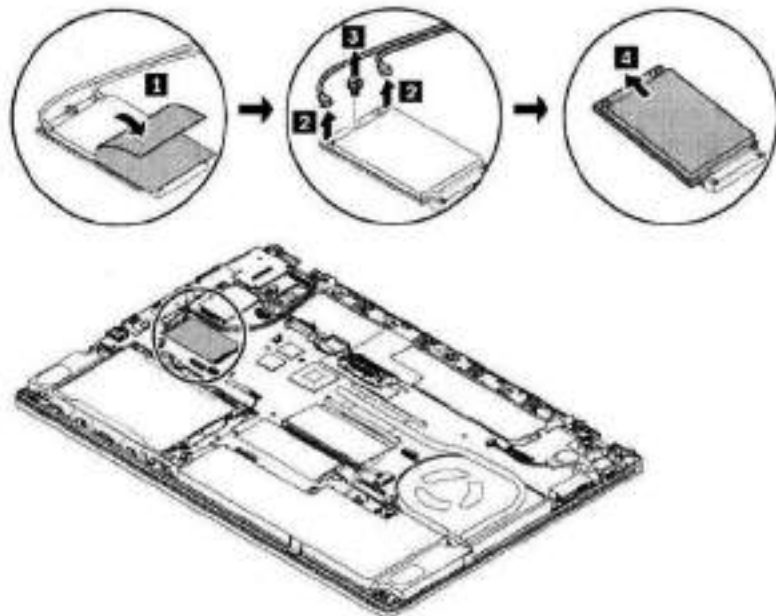
The following information is only applies to computer models with user-installable modules.

Before you start, read "Important safety information" on page v and print the following instructions.

**Attention:** Before you start installing a wireless-WAN card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. Static electricity could damage the card.

Some computers might come with a wireless-WAN card. To replace the wireless-WAN card, do the following:

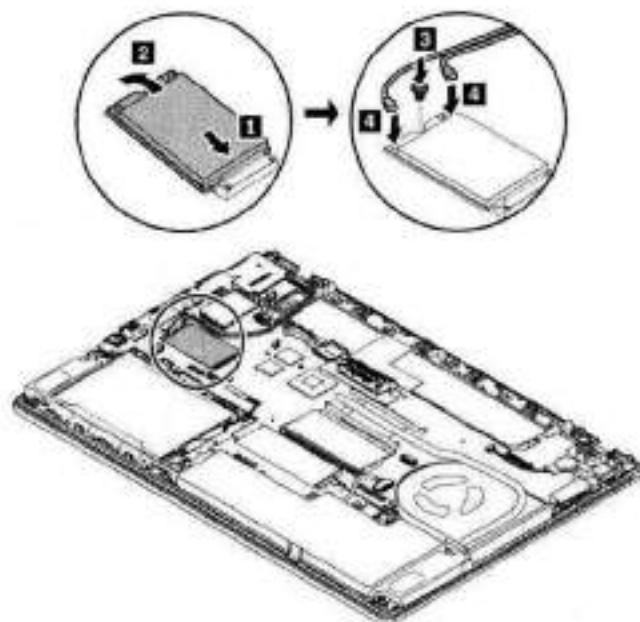
1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See ["Replacing the removable battery"](#) on page 98.
5. Remove the base cover assembly. See ["Replacing the base cover assembly"](#) on page 101.
6. To remove the wireless-WAN card, do the following:
  - a. Open the film to access the wireless-WAN card **1**.
  - b. Hold the cable connector with your fingers and gently disconnect each cable from the failing card **2**.
  - c. Remove the screw that secures the wireless-WAN card **3**. The card is released from the secured position and pivots upward.
  - d. Carefully remove the wireless-WAN card out of the slot **4**.



7. To install a new wireless-WAN card, do the following:
  - a. Align the notched edge of the new wireless-WAN card with the slot key in the slot. Then carefully insert the card into the slot at an angle about 20 degrees **1**. Pivot the new wireless-WAN card downward **2**.



- b. Install the screw to secure the card in place **3**. Connect the antenna cables to the new wireless-WAN card **4**. Ensure that you connect the orange cable to the main connector on the card, and the blue cable to the auxiliary connector on the card.



8. Reinstall the base cover assembly and the removable battery.  
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

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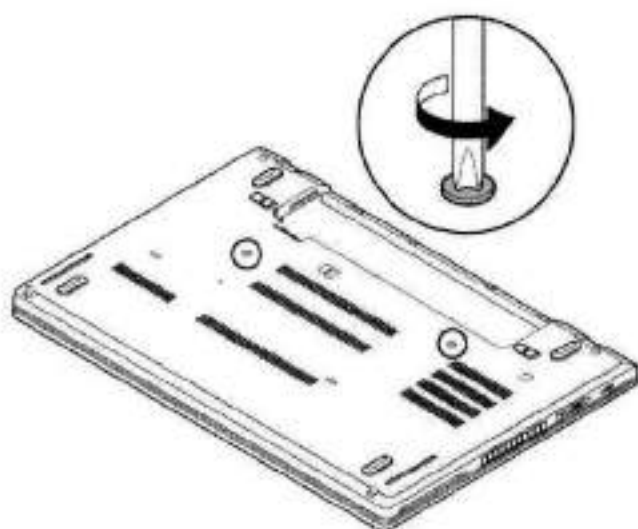
## Replacing the keyboard

Before you start, read "Important safety information" on page v and print the following instructions.

To remove the keyboard, do the following:

1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See ["Replacing the removable battery"](#) on page 98.

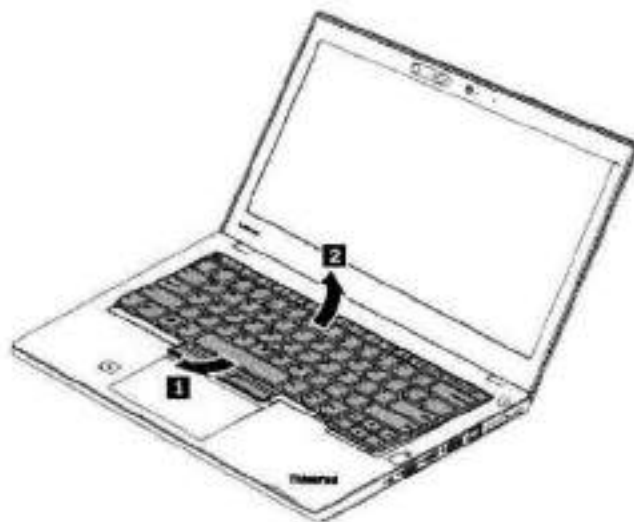
5. Loosen the two screws that secure the keyboard.



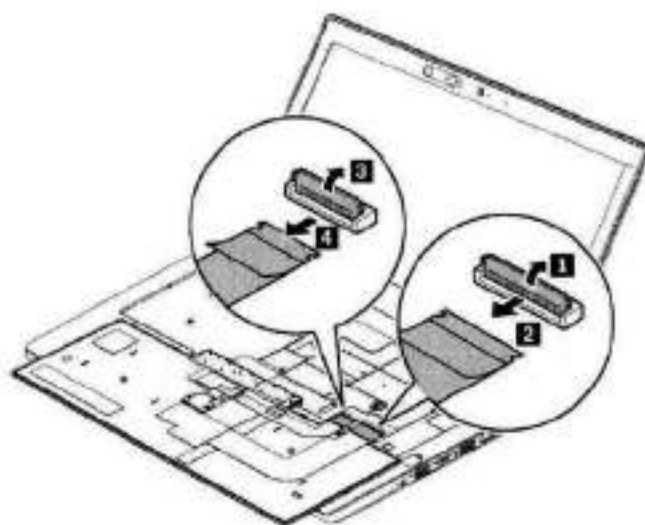
6. Turn the computer over and open the display. Push hard in the direction as shown to release the latches from the keyboard bezel.



7. Pivot the keyboard slightly upward as shown by arrow **1**. Then turn over the keyboard as shown by arrow **2**.

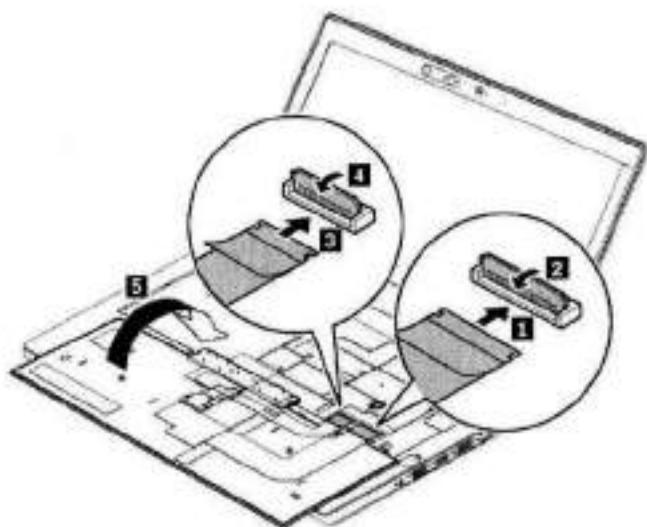


8. Put the keyboard on the palm rest and detach the connectors. Then remove the keyboard.

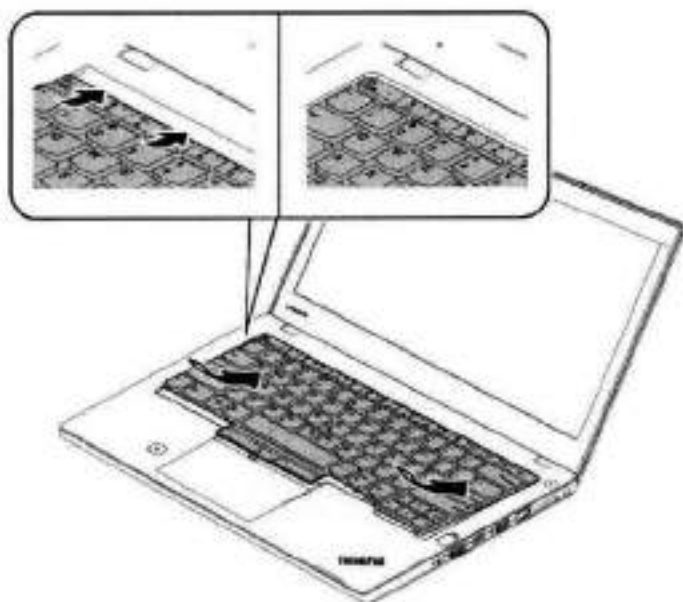


To install the new keyboard, do the following:

1. Attach the connectors, and then turn over the keyboard.



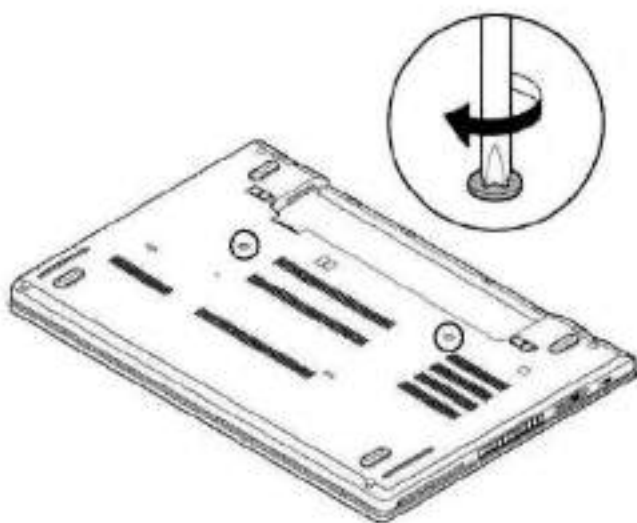
2. Insert the keyboard into the keyboard bezel as shown. Ensure that the top edge of the keyboard (the edge that is close to the computer display) is under the frame of the keyboard bezel.



- Slide the keyboard in the direction as shown by the arrows. Ensure that the latches are secured under the keyboard frame.



- Close the computer display and turn the computer over. Tighten the screws to secure the keyboard.



- Reinstall the removable battery.
- Turn the computer over. Connect the ac power adapter and all cables to the computer.

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## Replacing the coin-cell battery

Before you start, read "Important safety information" on page v and print the following instructions.

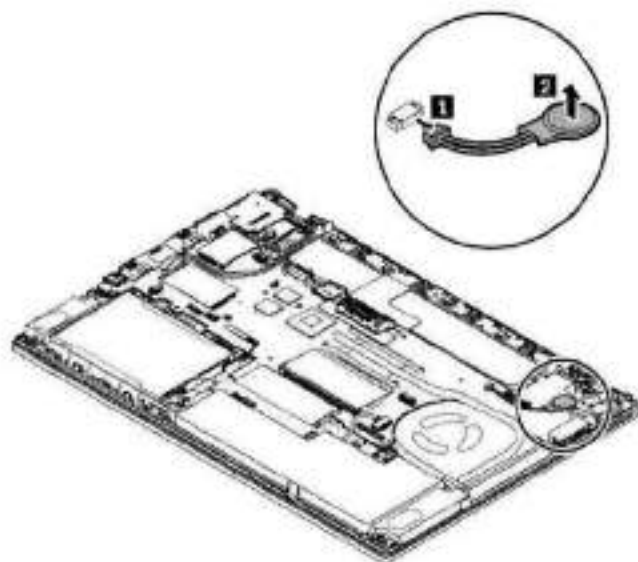


If the coin-cell battery is incorrectly replaced, there is danger of an explosion. The coin-cell battery contains a small amount of harmful substance. To avoid possible injury:

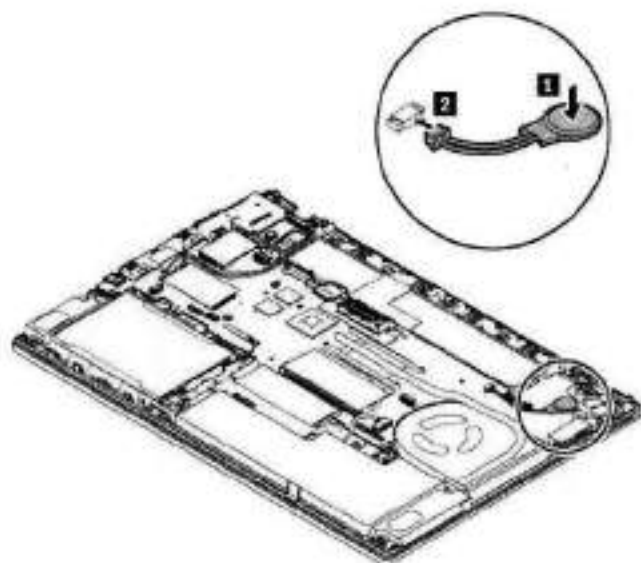
- Replace only with a battery of the type recommended by Lenovo.
- Keep the battery away from fire.
- Do not expose it to excessive heat.
- Do not expose it to water or rain.
- Do not short-circuit it.
- Do not drop, crush, puncture the battery, or make it subject to strong forces. Battery abuse or mishandling can cause the battery to overheat, which can cause gasses or flame to "vent" from the battery or coin-cell battery.

To replace the coin-cell battery, do the following:

1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See ["Replacing the removable battery"](#) on page 98.
5. Remove the base cover assembly. See ["Replacing the base cover assembly"](#) on page 101.
6. Detach the connector **1**, and then remove the coin-cell battery **2**.



7. Install the new coin-cell battery **1** and attach the connector **2**.



8. Reinstall the base cover assembly and the removable battery.
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

**Attention:** After you replace the coin-cell battery, reset the system date and time in the ThinkPad Setup program. See "Date/Time menu" on page 68.





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## Chapter 10. Getting support

This chapter provides information about getting help and support from Lenovo.

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### Before you contact Lenovo

Often, you can solve your computer problems by referring to the information in the explanations of error codes, running diagnostic programs, or by consulting the Lenovo Support Web site.

#### Registering your computer

Register your computer with Lenovo. For more information, see "Registering your computer" on page 15.

#### Downloading system updates

Downloading updated software might resolve problems you experience with your computer.

To download updated software, go to the following Web site and follow the instructions on the screen:

<http://www.lenovo.com/support>

#### Recording information

Before you talk to a Lenovo representative, record the following important information about your computer.

#### Recording problem symptoms and details

Collect the answers to the following questions before you call for help. Then, you are able to get help as quickly as possible.

- What is the problem? Is it continuous or intermittent?
- Is there an error message? What is the error code, if any?
- What operating system are you using? Which version?
- Which software applications were running at the time of the problem?
- Can the problem be reproduced? If so, how?

#### Recording system information

The serial number label is on the bottom of your computer. Record the machine type and the serial number.

- What is the name of your Lenovo product?
- What is the machine type?
- What is the serial number?

---

### Getting help and service

If you need help, service, technical assistance, or more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

Information about your computer and preinstalled software, if any, is available in the documentation that comes with your computer or on the Lenovo Support Web site at <http://www.lenovo.com/support>. The documentation includes printed books, online books, readme files, and help files.

Microsoft Service Packs are the latest software source for Windows product updates. They are available through Web download (connection charges might apply) or through discs. For more specific information and links, go to <https://www.microsoft.com>. Lenovo offers technical assistance with installation of, or questions related to, Service Packs for your Lenovo-preinstalled Microsoft Windows product. For more information, contact the Customer Support Center.

## Lenovo Support Web site

Technical support information is available on the Lenovo Support Web site at <http://www.lenovo.com/support>.

This Web site is updated with the latest support information such as the following:

- Drivers and software
- Diagnostic solutions
- Product and service warranty
- Product and parts details
- User guides and manuals
- Knowledge base and frequently asked questions

## Calling Lenovo

If you have tried to correct the problem yourself and still need help, during the warranty period, you can get help and information by telephone through the Customer Support Center. The following services are available during the warranty period:

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- Lenovo hardware repair - If the problem is determined to be caused by Lenovo hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. Lenovo or your reseller, if authorized by Lenovo, will make selected Engineering Changes (ECs) that apply to your hardware available.

The following items are not covered:

- Replacement or use of parts not manufactured for or by Lenovo or nonwarranted parts
- Identification of software problem sources
- Configuration of UEFI BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of programs

For the terms and conditions of the Lenovo Limited Warranty that apply to your Lenovo hardware product, see "Warranty information" in the *Safety and Warranty Guide* that comes with your computer.

If possible, be near your computer when you make your call. Ensure that you have downloaded the most current drivers and system updates, run diagnostics, and recorded information before you call. When calling for technical assistance, have the following information available:

- Machine type and model
- Serial numbers of your computer, monitor, and other components, or your proof of purchase
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information for your system

### **Telephone numbers**

For a list of the Lenovo Support phone numbers for your country or region, go to <http://www.lenovo.com/support/phone> or refer to the *Safety and Warranty Guide* that comes with your computer.

**Note:** Phone numbers are subject to change without notice. The latest phone numbers are available at <http://www.lenovo.com/support/phone>. If the number for your country or region is not provided, contact your Lenovo reseller or Lenovo marketing representative.

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### **Purchasing additional services**

During and after the warranty period, you can purchase additional services. Service availability and service name might vary by country or region.

For more information about these services, go to <http://www.lenovo.com/essentials>.

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## Appendix A. Supplemental information about the Ubuntu operating system

In limited countries or regions, Lenovo offers customers an option to order computers with the preinstalled Ubuntu® operating system.

If the Ubuntu operating system is available on your computer, read the following information before you use the computer. Ignore any information related to Windows-based programs, utilities, and Lenovo preinstalled applications in this documentation.

### Accessing the Lenovo Limited Warranty

This product is covered by the terms of the Lenovo Limited Warranty (LLW), version L505-0010-02 08/2011. You can view the LLW in a number of languages from the following Web site. Read the Lenovo Limited Warranty at:

[http://www.lenovo.com/warranty/llw\\_02](http://www.lenovo.com/warranty/llw_02)

The LLW also is preinstalled on the computer. To access the LLW, go to the following directory:

```
/usr/share/doc/lenovo-doc
```

If you cannot view the LLW either from the Web site or from your computer, contact your local Lenovo office or reseller to obtain a printed version of the LLW.

### Accessing the Ubuntu help system

The Ubuntu help system provides information about how to use the Ubuntu operating system. To access the help system from the Unity, move your pointer to the Launch bar, and then click the **Help** icon. If you cannot find the **Help** icon from the Launch bar, click the **Search** icon, and type Help to search it.

To learn more about the Ubuntu operating system, go to:

<https://www.ubuntu.com>

### Getting support information

If you need help, service, technical assistance, or more information about the Ubuntu operating system or other applications, contact the provider of the Ubuntu operating system or the provider of the application. If you need the service and support for hardware components shipped with your computer, contact Lenovo. For more information about how to contact Lenovo, refer to the *User Guide and Safety and Warranty Guide*.

To access the latest *User Guide and Safety and Warranty Guide*, go to:

<http://www.lenovo.com/support>



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## Appendix B. Regulatory information

This chapter provides regulatory and compliance information about Lenovo products.

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### Certification-related information

**Product name:** ThinkPad T460

**Compliance ID:** TP00088C

**Machine types:** 20L5 and 20L6

The latest compliance information is available at:

<http://www.lenovo.com/compliance>

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### Wireless-related information

This topic provides wireless-related information about Lenovo products.

#### Wireless interoperability

Wireless-LAN card is designed to be interoperable with any wireless-LAN product that is based on Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CCK), and/or Orthogonal Frequency Division Multiplexing (OFDM) radio technology, and is compliant to:

- The 802.11b/g Standard, 802.11a/b/g, 802.11n, or 802.11ac on wireless-LANs, as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity (Wi-Fi®) certification as defined by the Wi-Fi Alliance®.

Your Bluetooth card supports Windows 10 in-box Bluetooth profiles. Some computer models might be equipped with a Bluetooth card compliant with the Bluetooth Specification version 4.2 as defined by the Bluetooth Special Interest Group SIG. However, the Windows operating system might limit the support only on the Bluetooth Specification version 4.1.

#### Usage environment and your health

This computer contains integrated wireless cards that operate within the guidelines identified by radio frequency (RF) safety standards and recommendations; therefore, Lenovo believes that this product is safe for use by consumers. These standards and recommendations reflect the consensus of the worldwide scientific community, and result from deliberations of panels and committees of scientists, who continually review and interpret the extensive research literature.

In some situations or environments, the use of wireless devices might be restricted by the proprietor of a building or responsible representatives of an organization. For example, these situations and areas might include the following:

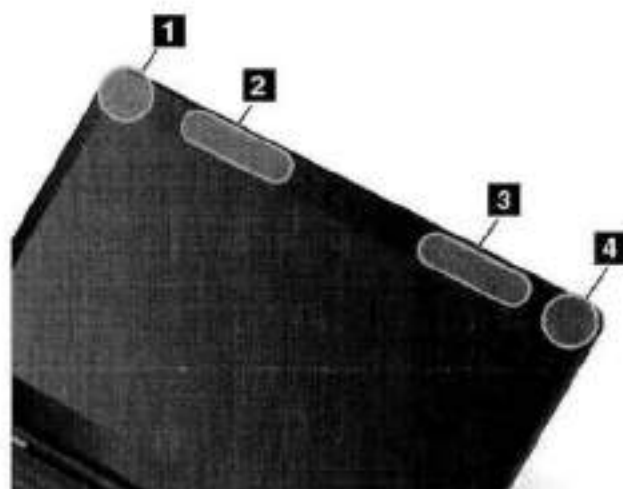
- On board of airplanes, in hospitals or near petrol stations, blasting areas (with electro-explosive devices), medical implants or body-worn electronic medical devices, such as pace makers.
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies to the use of wireless devices in a specific area (such as an airport or hospital), you are encouraged to ask for authorization to use a wireless device prior to turning on the computer.

## Locating the UltraConnect wireless antennas

ThinkPad notebook computers feature an integrated UltraConnect™ wireless antenna system built into the display for optimal reception, enabling wireless communication wherever you are.

The following illustration shows the antennas locations of your computer:



- 1 Wireless-LAN antenna (auxiliary)
- 2 Wireless-WAN antenna (auxiliary, available on some models)
- 3 Wireless-WAN antenna (main, available on some models)
- 4 Wireless-LAN antenna (main)

## Wireless-radio compliance information

Computer models equipped with wireless communications comply with the radio frequency and safety standards of any country or region in which it has been approved for wireless use.

### Brazil wireless-radio compliance information

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

This equipment is a secondary type device, that is, it is not protected against harmful interference, even if the interference is caused by a device of the same type, and it also cannot cause any interference to primary type devices.

### Mexico wireless-radio compliance information

**Advertencia:** En Mexico la operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

## Locating wireless regulatory notices

For more information about the wireless regulatory notices, refer to the *Regulatory Notice* shipped with your computer.

If your computer is shipped without the *Regulatory Notice*, you can find it on the Web site at:

<http://www.lenovo.com/support>

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## TCO certification

To obtain the TCO certification information for your computer, go to:

<http://www.lenovo.com/tco-cert>

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## Export classification notice

This product is subject to the United States Export Administration Regulations (EAR) and has an Export Classification Control Number (ECCN) of 5A992.c. It can be re-exported except to any of the embargoed countries in the EAR E1 country list.

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## Electronic emission notices

### Federal Communications Commission Declaration of Conformity

The following information refers to ThinkPad T480, machine types: 20L5, 20L6.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by using other than specified or recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:  
Lenovo (United States) Incorporated  
1009 Think Place - Building One  
Morrisville, NC 27560  
Phone Number: 919-294-5900





## Industry Canada Class B emission compliance statement

CAN ICES-3(B)/NMB-3(B)

## European Union conformity

EU Contact: Lenovo, Einsteinova 21, 851 01 Bratislava, Slovakia



**EMC Directive Statement:** This product is in conformity with the protection requirements of EU Council EMC Directive 2014/30/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility.

This product has been tested and found to comply with the limits for Class B equipment according to European Standards harmonized in the Directives in compliance. The Class B requirements for equipment are intended to offer adequate protection to broadcast services within residential environments.

**Radio Equipment Directive Statement:** This product is in conformity with all the requirements and essential norms that apply to EU Council Radio Equipment Directive 2014/53/EU on the approximation of the laws of the Member States relating to radio equipment. The full text of the system EU declaration of conformity and the EU wireless module declarations are available at the following Internet addresses:

- For notebook computers: <http://www.lenovo.com/eu-doc-notebooks>
- For tablets: <http://www.lenovo.com/eu-doc-tablets>

Lenovo cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the installation of option cards from other manufacturers. This product has been tested and found to comply with the limits for Class B equipment according to European Standards harmonized in the Directives in compliance. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

## German Class B compliance statement

### Deutschsprachiger EU Hinweis:

#### Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der Klasse B der Norm gemäß Richtlinie.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der Lenovo empfohlene Kabel angeschlossen werden. Lenovo übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der Lenovo verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der Lenovo gesteckt/eingebaut werden.

## Deutschland:

### Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Betriebsmitteln

Dieses Produkt entspricht dem „Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln“ EMVG (früher „Gesetz über die elektromagnetische Verträglichkeit von Geräten“). Dies ist die Umsetzung der EMV EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

### Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln, EMVG vom 20. Juli 2007 (früher Gesetz über die elektromagnetische Verträglichkeit von Geräten), bzw. der EMV EU Richtlinie 2014/30/EU, für Geräte der Klasse B.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung nach Paragraf 5 des EMVG ist die Lenovo (Deutschland) GmbH, Meitnerstr. 9, D-70563 Stuttgart.

Informationen in Hinsicht EMVG Paragraf 4 Abs. (1) 4:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse B.

## Japan VCCI Class B compliance statement

この装置は、クラスB情報技術装置です。この装置は家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。取扱書に従って正しい取り扱いをして下さい。

VCCI-B

## Japan compliance statement for products which connect to the power mains with rated current less than or equal to 20 A per phase

日本の定格電流が 20A相 以下の機器に対する高周波電流規制  
高周波電流規格 JIS C 61000-3-2 適合品

## Japan notice for ac power cord

The ac power cord shipped with your product can be used only for this specific product. Do not use the ac power cord for other devices.

本製品およびオプションに電源コード・セットが付属する場合は、それぞれ専用のものになっていますので他の電気機器には使用しないでください。

## Lenovo product service information for Taiwan

委製商/進口商名稱: 奇摩英聯想股份有限公司台灣分公司  
進口商地址: 台北市內湖區堤頂大道2段89號5樓  
進口商電話: 0800-000-702 (代表號)

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## Eurasian compliance mark



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## Brazil audio notice

Ouvir sons com mais de 85 decibéis por longos períodos pode provocar danos ao sistema auditivo.



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## Appendix C. WEEE and recycling statements

This chapter provides environmental information about Lenovo products.

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### General recycling information

Lenovo encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Lenovo offers a variety of programs and services to assist equipment owners in recycling their IT products. For information about recycling Lenovo products, go to:

<http://www.lenovo.com/recycling>

The latest environmental information about our products is available at:

<http://www.lenovo.com/ecodeclaration>

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### Important WEEE information



The WEEE marking on Lenovo products applies to countries with WEEE and e-waste regulations (for example, the European WEEE Directive, India E-Waste Management Rules). Appliances are labeled in accordance with local regulations concerning waste electrical and electronic equipment (WEEE). These regulations determine the framework for the return and recycling of used appliances as applicable within each geography. This label is applied to various products to indicate that the product is not to be thrown away, but rather put in the established collection systems for reclaiming these end of life products.

Users of electrical and electronic equipment (EEE) with the WEEE marking must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, and recovery of WEEE and to minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. Lenovo electrical and electronic equipment (EEE) may contain parts and components, which at end-of-life might qualify as hazardous waste.

EEE and waste electrical and electronic equipment (WEEE) can be delivered free of charge to the place of sale or any distributor that sells electrical and electronic equipment of the same nature and function as the used EEE or WEEE.

For additional WEEE information, go to:

<http://www.lenovo.com/recycling>

#### WEEE information for Hungary

Lenovo, as a producer, bears the cost incurred in connection with the fulfillment of Lenovo's obligations under Hungary Law No. 197/2014 (VIII.1.) subsections (1)-(5) of section 12.

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## Japan recycling statements

### Collecting and recycling a disused Lenovo computer or monitor

If you are a company employee and need to dispose of a Lenovo computer or monitor that is the property of the company, you must do so in accordance with the Law for Promotion of Effective Utilization of Resources. Computers and monitors are categorized as industrial waste and should be properly disposed of by an industrial waste disposal contractor certified by a local government. In accordance with the Law for Promotion of Effective Utilization of Resources, Lenovo Japan provides, through its PC Collecting and Recycling Services, for the collecting, reuse, and recycling of disused computers and monitors. For details, visit the Lenovo Web site at:

<http://www.lenovo.com/recycling/japan>

Pursuant to the Law for Promotion of Effective Utilization of Resources, the collecting and recycling of home-used computers and monitors by the manufacturer was begun on October 1, 2003. This service is provided free of charge for home-used computers sold after October 1, 2003. For details, go to:

<http://www.lenovo.com/recycling/japan>

### Disposing of Lenovo computer components

Some Lenovo computer products sold in Japan may have components that contain heavy metals or other environmental sensitive substances. To properly dispose of disused components, such as a printed circuit board or drive, use the methods described above for collecting and recycling a disused computer or monitor.

### Disposing of disused lithium batteries from Lenovo computers

A button-shaped lithium battery is installed inside your Lenovo computer to provide power to the computer clock while the computer is off or disconnected from the main power source. If you need to replace it with a new one, contact your place of purchase or contact Lenovo for service. If you need to dispose of a disused lithium battery, insulate it with vinyl tape, contact your place of purchase or an industrial-waste-disposal operator, and follow their instructions.

Disposal of a lithium battery must comply with local ordinances and regulations.

### Disposing of a disused battery from Lenovo notebook computers

Your Lenovo notebook computer has a lithium ion battery or a nickel metal hydride battery. If you are a company employee who uses a Lenovo notebook computer and need to dispose of a battery, contact the proper person in Lenovo sales, service, or marketing, and follow that person's instructions. You also can refer to the instructions at:

<https://www.lenovo.com/jp/ja/environment/recycle/battery/>

If you use a Lenovo notebook computer at home and need to dispose of a battery, you must comply with local ordinances and regulations. You also can refer to the instructions at:

<https://www.lenovo.com/jp/ja/environment/recycle/battery/>

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## Recycling information for Brazil

### Declarações de Reciclagem no Brasil

#### Descarte de um Produto Lenovo Fora de Uso

Equipamentos elétricos e eletrônicos não devem ser descartados em lixo comum, mas enviados à pontos de coleta, autorizados pelo fabricante do produto para que sejam encaminhados e processados por empresas especializadas no manuseio de resíduos industriais, devidamente certificadas pelos órgãos ambientais, de acordo com a legislação local.

A Lenovo possui um canal específico para auxiliá-lo no descarte desses produtos. Caso você possua um produto Lenovo em situação de descarte, ligue para o nosso SAC ou encaminhe um e-mail para: [reciclar@lenovo.com](mailto:reciclar@lenovo.com), informando o modelo, número de série e cidade, a fim de enviarmos as instruções para o correto descarte do seu produto Lenovo.

---

## Battery recycling information for the European Union

EU



**Notice:** This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances.

Before placing electrical and electronic equipment (EEE) in the waste collection stream or in waste collection facilities, the end user of equipment containing batteries and/or accumulators must remove those batteries and accumulators for separate collection.

#### Disposing of lithium batteries and battery packs from Lenovo products

A coin-cell type lithium battery might be installed inside your Lenovo product. You can find details about the battery in the product documentation. If the battery needs to be replaced, contact your place of purchase or

contact Lenovo for service. If you need to dispose of a lithium battery, insulate it with vinyl tape, contact your place of purchase or a waste-disposal operator, and follow their instructions.

#### Disposing of battery packs from Lenovo products

Your Lenovo device might contain a lithium-ion battery pack or a nickel metal hydride battery pack. You can find details on the battery pack in the product documentation. If you need to dispose of a battery pack, insulate it with vinyl tape, contact Lenovo sales, service, or your place of purchase, or a waste-disposal operator, and follow their instructions. You also can refer to the instructions provided in the user guide for your product.

For proper collection and treatment, go to:

<http://www.lenovo.com/lenovo/environment>

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### Battery recycling information for Taiwan



廢電池請回收

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### Battery recycling information for the United States and Canada



US & Canada Only

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### Recycling information for China

(废弃电器电子产品回收处理管理条例) 提示性说明

联想鼓励拥有联想品牌产品的用户当不再需要此类产品时，遵守国家废弃电器电子产品回收处理相关法律法规，将其交给当地具有国家认可的回收处理资质的厂商进行回收处理。更多回收服务信息，请点击进入<http://support.lenovo.com.cn/activity/551.htm>

---

## Appendix D. Restriction of Hazardous Substances (RoHS) Directive

The latest environmental information about Lenovo products is available at:

<http://www.lenovo.com/eccdeclaration>

### European Union RoHS

This Lenovo product, with included parts (cables, cords, and so on) meets the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("RoHS recast" or "RoHS 2").

For more information about Lenovo worldwide compliance on RoHS, go to:

<http://www.lenovo.com/rohs-communication>

### Turkish RoHS

The Lenovo product meets the requirements of the Republic of Turkey Directive on the Restriction of the Use of Certain Hazardous Substances in Waste Electrical and Electronic Equipment (WEEE).

### Türkiye AEEE Yönetmeliğine Uygunluk Beyanı

Bu Lenovo ürünü, T.C. Çevre ve Orman Bakanlığı'nın "Atık Elektrik ve Elektronik Eşyalarda Bazı Zararlı Maddelerin Kullanımının Sınırlanmasına Dair Yönetmelik (AEEE)" direktifine uygundur.

AEEE Yönetmeliğine Uygundur.

### Ukraine RoHS

Цим підтверджуємо, що продукція Леново відповідає вимогам нормативних актів України, які обмежують вміст небезпечних речовин

### India RoHS

RoHS compliant as per E-Waste (Management) Rules.

### China RoHS

The information in the following table is applicable for products manufactured on or after January 1, 2015 for sale in the People's Republic of China.



### 产品中有害物质的名称及含量

部件名称	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件	X	0	0	0	0	0
硬盘	X	0	0	0	0	0
光驱	X	0	0	0	0	0
LCD 面板 (LED 背光源)	X	0	0	0	0	0
键盘	X	0	0	0	0	0
内存	X	0	0	0	0	0
电池	X	0	0	0	0	0
电源适配器	X	0	0	0	0	0
底壳、顶盖和扬声器	X	0	0	0	0	0

注:

本表依据SJ/T 11364的规定编制。

0: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求。标有“X”的部件, 皆因全球技术发展水平限制而无法实现有害物质的替代。印刷电路板组件包括印刷电路板 (PCB) 及其组件、集成电路 (IC) 和连接器。某些型号的产品可能不包含上表中的某些部件, 请以实际购买机型为准。

图示:



在中华人民共和国境内销售的电子信息产品上将印有“环保使用期限” (EPU) 符号。圆圈中的数字代表产品的正常环保使用期限。

## Taiwan RoHS

單元 Unit	限用物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻Hexavalent chromium (Cr <sup>VI</sup> )	多溴聯苯Polybrominated biphenyls (PBB)	多溴二苯醚Polybrominated diphenyl ethers (PBDE)
印刷電路板組件	-	○	○	○	○	○
硬碟機	-	○	○	○	○	○
光碟機	-	○	○	○	○	○
LCD面板 (LED背光源)	-	○	○	○	○	○
鍵盤	-	○	○	○	○	○
記憶體	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
底殼、頂蓋和喇叭	-	○	○	○	○	○

備考1. “超出0.1 wt %”及“超出0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。  
Note 1: “Exceeding 0.1 wt %” and “exceeding 0.01 wt %” indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.

備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。  
Note 2: “○” indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.

備考3. “-”係指該項限用物質為排除項目。  
Note 3: The “-” indicates that the restricted substance corresponds to the exemption.

---

## Appendix E. ENERGY STAR model information



ENERGY STAR® is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy aimed at saving money and protecting the environment through energy efficient products and practices.

Lenovo is proud to offer our customers products with the ENERGY STAR qualified designation. You might find an ENERGY STAR mark affixed on the computer or displayed on the power settings interface. Lenovo computers of the following machine types, if carry an ENERGY STAR mark, have been designed and tested to conform to the ENERGY STAR program requirements for computers.

20L5 and 20L6

By using ENERGY STAR qualified products and taking advantage of the power-management features of the computer, you can help reduce the consumption of electricity. Reduced electrical consumption can contribute to potential financial savings, a cleaner environment, and the reduction of greenhouse gas emissions.

For more information about ENERGY STAR, go to:

<https://www.energystar.gov>

Lenovo encourages you to make efficient use of energy an integral part of your day-to-day operations. To help in this endeavor, Lenovo has preset the following power-management features to take effect when the computer has been inactive for a specified length of time:

**Power plan:** Default (when plugged into ac power)

- Turn off the display: After 10 minutes
- Put the computer to sleep: After 30 minutes

To awaken the computer from sleep mode, press the Fn key on your keyboard. For more information about these settings, see the Windows help information on the computer.

The Wake on LAN function is enabled when your Lenovo computer is shipped from the factory, and the setting remains valid even when the computer is in sleep mode. If you do not need to have Wake on LAN enabled while the computer is in sleep mode, you can reduce the power consumption and prolong the time in sleep mode, by disabling the setting of Wake on LAN for sleep mode.

To disable the setting of Wake on LAN for sleep mode, do the following:

1. Go to Control Panel and click **Hardware and Sound → Device Manager**.
2. In the Device Manager window, expand **Network adapters**.
3. Right-click your network adapter device, and click **Properties**.

4. Click the **Power Management** tab.
5. Clear the **Allow this device to wake the computer** check box.
6. Click **OK**.

---

## Appendix F. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

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Morrisville, NC 27560  
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Attention: Lenovo Director of Licensing*

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

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To obtain the most up-to-date documentation for your computer, go to:

<http://www.lenovo.com/support>

---

## Appendix G. Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

- Access Connections
- Lenovo
- Lenovo logo
- ThinkPad
- ThinkPad logo
- TrackPoint
- UltraConnect

Intel, Intel SpeedStep, Optane, and Thunderbolt are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

Microsoft, Windows, Direct3D, BitLocker, and Cortana are trademarks of the Microsoft group of companies.

DisplayPort are trademarks of the Video Electronics Standards Association.

Ubuntu is a registered trademark of Canonical Ltd.

The terms HDMI and HDMI High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

Wi-Fi, Wi-Fi Alliance, and Miracast are registered trademarks of Wi-Fi Alliance.

NVIDIA is a registered trademark of NVIDIA Corporation.

USB-C is a trademark of USB Implementers Forum.

Other company, product, and service names may be trademarks or service marks of others.





**Lenovo**

**Lenovo****Especificações técnicas T480 20L65CWJ00**

PN	20L65CWJ00
Descrição	T480 i5-8350U 8GB 256GB W10 Pro
	<b>NOVO</b>
Tela	14" LED HD Antirreflexo
Processador	Intel Core i5-8350U
Chipset	Intel SoC (System on Chip) platform
Vidro	Sim
Placa Gráfica Integrada	Intel HD Graphics Integrada
Placa de vídeo Dedicada	Não
Memória	8GB (1x8GB)
Tipo	2400MHz DDR4
Memória máxima suportada	32GB max (2 slots DDR4 SO-DIMM)
Unidade de Disco (capacidade)	256GB SSD M.2 PCIe-NVMe OPAL2
Tipo de Disco	SSD
Drive Ótico	Não
Drive Ótico (tipo)	Não
Audio	Dolby Audio Premium
Rede (Ethernet)	Gigabit
Slot WWAN	Sim
WWAN	Não - chip 4G não incluso
Rede (Wireless)	Intel 8265 AC Dual Band
Bluetooth	Bluetooth 4.1
Camera	HD (720p) com ThinkShutter e microfone
Biometria	Fingerprint Reader
Chip de Segurança	Sim
Dispositivo Apointador	UltraNav (TrackPoint+TouchPad)
Bateria (tipo)	6 Células [3 células 24Wh (interna) + 3 células 24 Wh (externa)]
Bateria (duração aprox.)	até 14,4 hrs*
Teclado (layout)	Português (BR)
Porta(s) USB	2x USB 3.1 (1 energizada) + 1x Type C
Porta Thunderbolt	1 x Thunderbolt™ 3 (USB Type-C)
Saída de Vídeo	te através de adaptador USB-Type C para VGA ou USB-Type C para DisplayPort - não incluso)
Saída HDMI	Sim
Express Card Slot	Não
Media Card Slot	4 em 1
Smart Card Slot	Não
Sistema Operacional	Windows 10 Professional 64 bits
Garantia	3 anos on-site
Código EAN/UPC	193268761735
Gabinete	PPS (tampa) / Fibra de vidro reforçada com plástico (base)
Peso (Kg)	1,65
Dimensões (L x P x A)	336.0mm x 232.5mm x 19.95mm

# ThinkPad<sup>®</sup>

## T480 User Guide

# ThinkPad

Lenovo<sup>®</sup>

**Note:** Before using this information and the product it supports, ensure that you read and understand the following:

- Safety and Warranty Guide
- Setup Guide
- "Important safety information" on page v

The latest Safety and Warranty Guide, Setup Guide, and the Regulatory Notice are available on the Lenovo Support Web site at:

<http://www.lenovo.com/support>

First Edition (January 2018)

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## Important safety information

**Note:** Read the important safety information first.

### Read this first

This information can help you safely use your notebook computer. Follow and retain all information included with your computer. The information in this document does not alter the terms of your purchase agreement or the Lenovo Limited Warranty. For more information, see "Warranty Information" in the Safety and Warranty Guide that comes with your computer.

Customer safety is important. Our products are developed to be safe and effective. However, personal computers are electronic devices. Power adapters and other features can create potential safety risks that can result in physical injury or property damage, especially if misused. To reduce these risks, follow the instructions included with your product, observe all warnings on the product and in the operating instructions, and review the information included in this document carefully. By carefully following the information contained in this document and provided with your product, you can help protect yourself from hazards and create a safer computer work environment.

**Note:** This information includes references to power adapters and batteries. In addition to notebook computers, some products (such as speakers and monitors) ship with external power adapters. If you have such a product, this information applies to your product. In addition, computer products contain a coin-sized internal battery that provides power to the system clock even when the computer is unplugged, so the battery safety information applies to all computer products.

### Important information about using your computer

Ensure that you follow the important tips given here to get the most use and enjoyment out of your computer. Failure to do so might lead to discomfort or injury, or cause the computer to fail.

#### Protect yourself from the heat that your computer generates.



When your computer is turned on or the battery is charging, the base, the palm rest, and some other parts may become hot. The temperature they reach depends on the amount of system activity and the level of charge in the battery.

Extended contact with your body, even through clothing, could cause discomfort or even a skin burn.

- Avoid keeping your hands, your lip, or any other part of your body in contact with a hot section of the computer for any extended time.
- Periodically take hands from using the keyboard by lifting your hands from the palm rest.

#### Protect yourself from the heat generated by the ac power adapter.



When the ac power adapter is connected to an electrical outlet and your computer, it generates heat.

Extended contact with your body, even through clothing, may cause a skin burn.

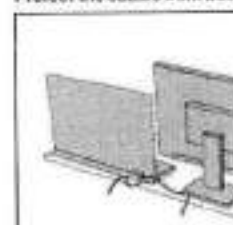
- Do not place the ac power adapter in contact with any part of your body while it is in use.
- Never use it to warm your body.

#### Prevent your computer from getting wet.



To avoid spills and the danger of electrical shock, keep liquids away from your computer.

#### Protect the cables from being damaged.



Applying strong force to cables may damage or break them.

Route communication lines, or the cables of an ac power adapter, a mouse, a keyboard, a printer, or any other electronic device, so that they cannot be walked on, tripped over, pinched by your computer or other objects, or in any way subject to treatment that could interfere with the operation of your computer.

#### Protect your computer and data when moving it.

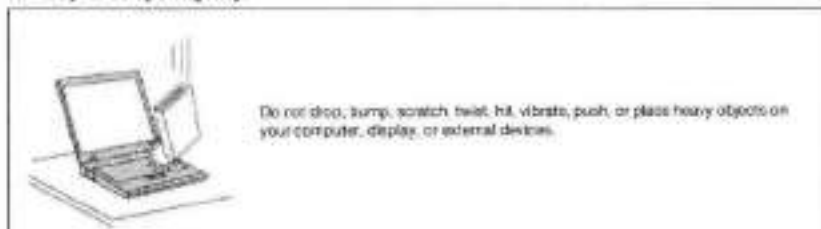


Before moving a computer equipped with a hard disk drive, do one of the following:

- Turn it off.
- Put it in sleep mode.
- Put it in hibernation mode.

This helps to prevent damage to the computer, and possible loss of data.

#### Handle your computer gently.



#### Carry your computer carefully.



#### Conditions that require immediate action

Products can become damaged due to misuse or neglect. Some product damage is serious enough that the product should not be used again until it has been inspected and, if necessary, repaired by an authorized service.

As with any electronic device, pay close attention to the product when it is turned on. On very rare occasions, you might notice an odor or see a puff of smoke or sparks vent from your product. Or you might hear sounds like popping, crackling or hissing. These conditions might merely mean that an internal electronic component has failed in a safe and controlled manner. Or, they might indicate a potential safety issue. However, do not take risks or attempt to diagnose the situation yourself. Contact the Customer Support Center for further guidance. For a list of Service and Support phone numbers, see the following Web site:  
<http://www.lenovo.com/support/phone>

Frequently inspect your computer and its components for damage or wear or signs of danger. If you have any question about the condition of a component, do not use the product. Contact the Customer Support Center or the product manufacturer for instructions on how to inspect the product and have it repaired, if necessary.

In the unlikely event that you notice any of the following conditions, or if you have any safety concerns with your product, stop using the product and unplug it from the power source and telecommunication lines until you can speak to the Customer Support Center for further guidance.

- Plugs, power adapters, extension cords, surge protectors, or power supplies that are cracked, broken, or damaged.

- Signs of overheating, smoke, sparks, or fire.
- Damage to a battery (such as cracks, dents, or creases), discharge from a battery, or a buildup of foreign substances on the battery.
- A crackling, hissing or popping sound, or strong odor that comes from the product.
- Signs that liquid has been spilled or an object has fallen onto the computer product or the power adapter.
- The computer product or power adapter has been exposed to water.
- The product has been dropped or damaged in any way.
- The product does not operate normally when you follow the operating instructions.

**Note:** If you notice these conditions with a product (such as an extension cord) that is not manufactured for or by Lenovo, stop using that product until you can contact the product manufacturer for further instructions, or until you get a suitable replacement.

#### Service and upgrades

Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center or your documentation. Only use a Service Provider who is approved to repair your particular product.

**Note:** Some computer parts can be upgraded or replaced by the customer. Upgrades typically are referred to as options. Replacement parts approved for customer installation are referred to as Customer Replaceable Units, or CRUs. Lenovo provides documentation with instructions when it is appropriate for customers to install options or replace CRUs. You must closely follow all instructions when installing or replacing parts. Before you remove the covers from a product equipped with a power adapter, always make sure that the power is turned off and that the product is unplugged from any power source. If you have any questions or concerns, contact the Customer Support Center.

Although there are no moving parts in your computer after the power adapter has been disconnected, the following warnings are required for your safety.



**CAUTION:**  
Hazardous moving parts. Keep fingers and other body parts away.

**CAUTION:**



Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

## Power adapters



Use only the power adapters supplied by the product manufacturer.

Never wrap a power adapter cable around a power adapter or other object. Doing so can stress the cord in ways that can cause the power adapter cable to fray, crack, or crimp. This can present a safety hazard.

Always route the power adapter cable so that they will not be walked on, tripped over, or pinched by objects.

Protect power adapters from liquids. For instance, do not leave your power adapter near sinks, tubs, toilets, or on floors that are cleaned with liquid cleansers. Liquids can cause a short circuit, particularly if the power adapter has been stressed by misuse. Liquids also can cause gradual corrosion of the connector terminals on a power adapter, which can eventually result in overheating.

Ensure that all power adapter connectors are securely and completely plugged into receptacles.

Do not use any power adapter that shows corrosion at the ac input pins or shows signs of overheating (such as deformed plastic) at the ac input pins or anywhere on the power adapter.

To prevent possible overheating, do not cover the power adapter with clothing or other objects when the power adapter is plugged into an electrical outlet.

## Extension cords and related devices

Ensure that extension cords, surge protectors, uninterruptible power supplies, and power strips that you use are rated to handle the electrical requirements of the product. Never overload these devices. If power strips are used, the load should not exceed the power strip input rating. Consult an electrician for more information if you have questions about power loads, power requirements, and input ratings.

## Plugs and outlets



If a receptacle (power outlet) that you intend to use with your computer equipment appears to be damaged or corroded, do not use the outlet until it is replaced by a qualified electrician.

Do not bend or modify the plug. If the plug is damaged, contact the manufacturer to obtain a replacement.

Do not share an electrical outlet with other home or commercial appliances that draw large amounts of electricity; otherwise, unstable voltage might damage your computer, data, or attached devices.

Some products are equipped with a three-pronged plug. This plug fits only into a grounded electrical outlet. This is a safety feature. Do not defeat this safety feature by trying to insert it into a non-grounded outlet. If you cannot insert the plug into the outlet, contact an electrician for an approved outlet adapter or to replace the outlet with one that enables this safety feature. Never overload an electrical outlet. The overall system load should not exceed 80 percent of the branch circuit rating. Consult an electrician for more information if you have questions about power loads and branch circuit ratings.

Be sure that the power outlet you are using is properly wired, easily accessible, and located close to the equipment. Do not fully extend power adapter cable in a way that will stress the cords.

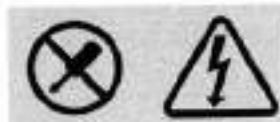
Be sure that the power outlet provides the correct voltage and current for the product you are installing.

Carefully connect and disconnect the equipment from the electrical outlet.

## Power supply statement



Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.



## External devices

### CAUTION:

Do not connect or disconnect any external device cables other than Universal Serial Bus (USB) and 1394 cables while the computer power is on; otherwise, you might damage your computer. To avoid possible damage to attached devices, wait at least five seconds after the computer is shut down to disconnect external devices.

## General battery notice



Batteries supplied by Lenovo for use with your product have been tested for compatibility and should only be replaced with approved parts. A battery other than the one specified by Lenovo, or a disassembled or modified battery is not covered by the warranty.

Battery abuse or mishandling can cause overheating, liquid leakage, or an explosion. To avoid possible injury, do the following:

- Do not open, disassemble, or service any battery.
- Do not crush or puncture the battery.
- Do not short-circuit the battery, or expose it to water or other liquids.
- Keep the battery away from children.
- Keep the battery away from fire.

Stop using the battery if it is damaged, or if you notice any discharge or the buildup of foreign materials on the battery leads.

Store the rechargeable batteries or products containing the rechargeable batteries at room temperature, charged to approximately 30 to 50% of capacity. We recommend that the batteries be charged about once per year to prevent overdischarge.

Do not put the battery in trash that is disposed of in landfills. When disposing of the battery, comply with local ordinances or regulations.

## Notice for removable rechargeable battery



Only recharge the battery strictly according to instructions included in the product documentation.

If the battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substances.

## Notice for built-in rechargeable battery



Do not attempt to remove or replace the built-in rechargeable battery. Replacement of the battery must be done by a Lenovo-authorized repair facility or technician.

Only recharge the battery strictly according to instructions included in the product documentation.

The Lenovo-authorized repair facilities or technicians recycle Lenovo batteries according to local laws and regulations.

## Notice for non-rechargeable coin-cell battery



If the coin-cell battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substance.

Do not heat to more than 100°C (212°F).

The following statement applies to users in the state of California, U.S.A.

### California Perchlorate Information:

Products containing manganese dioxide lithium coin-cell batteries may contain perchlorate.

Perchlorate Material - special handling may apply. See <http://www.dtsc.ca.gov/HazardousWaste/perchlorate>

## Heat and product ventilation



Computers, ac power adapters, and many accessories can generate heat when turned on and when batteries are charging. Notebook computers can generate a significant amount of heat due to their compact size. Always follow these basic precautions:

- When your computer is turned on or the battery is charging, the base, the palm rest, and some other parts may become hot. Avoid keeping your hands, your lap, or any other part of your body in contact with a hot section of the computer for any extended length of time. When you use the keyboard, avoid keeping your palms on the palm rest for a prolonged period of time. Your computer generates some heat during normal operation. The amount of heat depends on the amount of system activity and the battery charge level. Extended contact with your body, even through clothing, could cause discomfort or even a skin burn. Periodically take breaks from using the keyboard by lifting your hands from the palm rest; and be careful not to use the keyboard for any extended length of time.
- Do not operate your computer or charge the battery near flammable materials or in explosive environments.
- Ventilation slots, fans and/or heat sinks are provided with the product for safety, comfort, and reliable operation. These features might inadvertently become blocked by placing the product on a bed, sofa, carpet, or other flexible surface. Never block, cover, or disable these features.
- When the ac power adapter is connected to an electrical outlet and your computer, it generates heat. Do not place the adapter in contact with any part of your body while using it. Never use the ac power adapter to warm your body. Extended contact with your body, even through clothing, may cause a skin burn.

For your safety, always follow these basic precautions with your computer:

- Keep the cover closed whenever the computer is plugged in.
- Regularly inspect the outside of the computer for dust accumulation.
- Remove dust from vents and any perforations in the bezel. More frequent cleanings might be required for computers in dusty or high-traffic areas.
- Do not restrict or block any ventilation openings.
- Do not operate your computer inside furniture, as this might increase the risk of overheating.
- Airflow temperatures into the computer should not exceed 35°C (95°F).

## Electrical current safety information



Electric current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not use your computer during a lightning storm.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect power adapter to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- Whenever possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the power adapter and all the cables before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Do not use your computer until all internal parts enclosures are fastened into place. Never use the computer when internal parts and circuits are exposed.



Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power adapter to outlets.
5. Turn devices ON.

To disconnect:

1. Turn everything OFF.
2. First, remove power adapter from outlets.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

The power adapter must be disconnected from the wall outlet or receptacle before installing all other electrical cables connected to the computer.

The power adapter may be reconnected to the wall outlet or receptacle only after all other electrical cables have been connected to the computer.

## Liquid crystal display (LCD) notice

### CAUTION:

The liquid crystal display (LCD) is made of glass, and rough handling or dropping the computer can cause the LCD to break. If the LCD breaks and the internal fluid gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes; if any symptoms are present after washing, get medical care.

**Note:** For products with mercury-containing fluorescent lamps (for example, non-LED), the fluorescent lamp in the liquid crystal display (LCD) contains mercury; dispose of according to local, state, or federal laws.

## Using headphones or earphones

### CAUTION:

Excessive sound pressure from earphones and headphones can cause hearing loss. Adjustment of the equalizer to maximum increases the earphone and headphone output voltage and the sound pressure level. Therefore, to protect your hearing, adjust the equalizer to an appropriate level.

Excessive use of headphones or earphones for a long period of time at high volume can be dangerous if the output of the headphone or earphone connectors do not comply with specifications of EN 50332-2. The headphone output connector of your computer complies with EN 50332-2 Sub clause 7. This specification limits the computer's maximum wide band true RMS output voltage to 150 mV. To help protect against hearing loss, ensure that the headphones or earphones you use also comply with EN 50332-2 (Clause 7 limit) for a wide band characteristic voltage of 75 mV. Using headphones that do not comply with EN 50332-2 can be dangerous due to excessive sound pressure levels.

If your Lenovo computer came with headphones or earphones in the package, as a set, the combination of the headphones or earphones and the computer already complies with the specifications of EN 50332-1. If different headphones or earphones are used, ensure that they comply with EN 50332-1 (Clause R.6 Limitation Values). Using headphones that do not comply with EN 50332-1 can be dangerous due to excessive sound pressure levels.

## Choking hazard notice



CHOKING HAZARD – Product contains small parts.

Keep away from children under three years.

## Plastic bag notice



Plastic bags can be dangerous. Keep plastic bags away from babies and children to avoid danger of suffocation.

## Glass parts notice

### CAUTION:

Some parts of your product may be made of glass. This glass could break if the product is dropped on a hard surface or receives a substantial impact. If glass breaks, do not touch or attempt to remove it. Stop using your product until the glass is replaced by trained service personnel.

## Chapter 1. Product overview

This chapter provides basic information to help you get familiar with your computer.

### Computer controls, connectors, and indicators

This section introduces hardware features of the computer.

#### Front view



■ Infrared camera*	■ Microphones
■ Conventional camera*	■ Conventional camera with camera shutter*
■ Power button	■ Fingerprint reader*
■ TrackPoint buttons	■ Trackpad
■ TrackPoint® pointing stick	■ NFC mark*
■ Screen (multi-touch screen on some models)	

**Note:** \* Available on some models.

#### ■ Infrared camera

The infrared camera provides a personal and secure way for you to sign in to your computer with face authentication. After setting the infrared camera for face authentication, you can unlock your computer by scanning your face instead of using a password. For more information, see "Using the cameras" on page 31.

**Note:** The infrared camera is supported only on the Windows 10 operating system.

#### ■ Microphones

The microphones capture sound and voice when used with a program capable of handling audio.

#### ■ Conventional camera

The camera enables you to take pictures or hold a video conference. For more information, see "Using the cameras" on page 31.

#### ■ Conventional camera with camera shutter

The camera enables you to take pictures or hold a video conference. You can use the camera shutter to cover (slide to the right) or unveil (slide to the left) the camera lens.

#### ■ Power button

Press the power button to turn on the computer or put the computer into sleep mode.

To turn off the computer, open the Start menu, click **Power**, and then click **Shut down**.

If your computer is unresponsive, you can turn off the computer by pressing and holding the power button for four or more seconds. If the computer cannot be turned off, see "Computer stops responding" on page 78 for more information.

You also can define what the power button does. For example, by pressing the power button, you can turn off the computer or put the computer into sleep or hibernation mode. To change what the power button does, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options** → **Choose what the power buttons do**.
3. Follow the instructions on the screen.

#### ■ Fingerprint reader

Fingerprint authentication provides simple and secure user access by associating your fingerprint with a password. For more information, see "Using the fingerprint reader" on page 54.

### ThinkPad pointing device

- TrackPoint buttons
- Trackpad
- TrackPoint pointing stick

Your computer is equipped with the Lenovo-unique ThinkPad® pointing device. For more information, see "ThinkPad pointing device overview" on page 20.

### ■ NFC mark

Near field communication (NFC) is a high-frequency and short-range wireless communication technology. By using NFC, you can establish the radio communications between your computer and another NFC-enabled device over a few centimeters or inches. For more information, see "Using the NFC devices" on page 28.

### ■ Screen (multi-touch screen on some models)

The multi-touch screen enables you to use your computer with simple touch gestures. For more information, see "Using the multi-touch screen" on page 14.

## Left-side view



■ USB-C™ connector	■ USB-C connector (Thunderbolt™ 3 compatible)
■ Docking station connector	■ Fan louvers
■ Smart-card slot*	

Note: \* Available on some models.

### ■ USB-C™ connector

The USB-C connector / power connector on your computer supports both the USB Type-C™ standard. With an appropriate USB-C cable connected, you can use the connector to transfer data, charge your device, or connect your computer to external displays.

The USB-C connector also works as the power connector. Use the shipped USB-C power adapter and power cord to connect the computer to ac power through the USB-C connector.

Lenovo provides various USB-C accessories to help you expand your computer functionality. For more information, go to: <http://www.lenovo.com/essentials>

Note: When the battery power is below 10%, the USB-C accessories connected to the USB-C connector might not work correctly.

### ■ USB-C connector (Thunderbolt™ 3 compatible)

The USB-C connector on your computer supports both the USB Type-C standard and the Thunderbolt 3 technology. With an appropriate USB-C cable connected, you can use the connector to transfer data, charge your device, or connect your computer to external displays.

The USB-C connector also works as the power connector. Use the shipped USB-C power adapter and power cord to connect the computer to ac power through the USB-C connector.

Lenovo provides various USB-C accessories to help you expand your computer functionality. For more information, go to: <http://www.lenovo.com/essentials>

Note: When the battery power is below 10%, the USB-C accessories connected to the USB-C connector might not work correctly.

### ■ Docking station connector

Connect your computer to a supported docking station to extend the computer capabilities. For more information, see "Attaching your computer to a docking station" on page 38.

### ■ Fan louvers

The fan louvers and internal fan enable air to circulate in the computer to ensure proper cooling, especially the cooling of the microprocessor.

Note: To ensure proper airflow, do not place any obstacles in front of the fan louvers.

### ■ Smart-card slot

Use smart cards for authentication, data storage, and application processing. Within large organizations, you might also use smart cards for strong security authentication of single sign-on (SSO). For more information, see "Using a media card or a smart card" on page 32.

## Right-side view



■ Audio connector	■ USB 3.1 connector Gen 1
■ HDMI™ connector	■ Always On USB 3.1 connector Gen 1
■ Ethernet connector	■ Media-card slot
■ Security lock slot	

### ■ Audio connector

Connect headphones or a headset with a 3.5-mm (0.14-inch), 4-pole plug to the audio connector to listen to the sound from the computer.

If you are using a headset with a function switch, do not press this switch while using the headset. If you press the switch, the headset microphone is disabled, and the integrated microphones on the computer are enabled instead.

Note: The audio connector does not support a conventional microphone. For more information, see "Using audio features" on page 30.

### ■ USB 3.1 connector Gen 1

Connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.

Attention: When you attach a USB cable to the connector, ensure that the USB mark is facing upward. Otherwise the connector might get damaged.

#### ■ HDMI connector

The High-Definition Multimedia Interface (HDMI) connector is a digital audio and video interface. It enables you to connect your computer to a compatible digital audio device or video monitor, such as a high-definition television (HDTV).

#### ■ Always-on USB 3.1 connector Gen 1

Connect USB-compatible devices and charge some mobile digital devices and smartphones when your computer is in sleep or hibernation mode.

#### ■ Ethernet connector

Connect the computer to a local area network (LAN). The Ethernet connector has two network status indicators. When the green indicator is on, the computer is connected to a LAN. When the yellow indicator blinks, data is being transmitted.



To avoid the risk of electrical shock, do not connect the telephone cable to the Ethernet connector. You can only connect an Ethernet cable to this connector.

**Note:** If the computer is connected to a docking station, use the Ethernet connector on the docking station instead of the one on the computer.

#### ■ Media-card slot

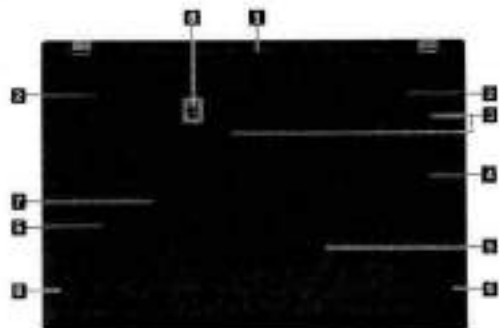
Insert a flash media card into the media-card slot for data access or storage. For more information, see "Using a media card or a smart card" on page 32.

#### ■ Security-lock slot

Lock your computer to a desk, table, or other fixtures through a security cable lock that fits this security-lock slot to protect your computer from theft.

**Note:** You are responsible for evaluating, selecting, and implementing the locking device and security features. Lenovo makes no comments, judgments, or warranties about the function, quality, or performance of the locking device and security features.

#### Bottom view



■ Removable battery	■ Latches
■ Docking-station hook holes	■ Fan louvers
■ Keyboard drainage holes	■ Speakers
■ Emergency-reset hole	■ Nano-SIM card slot*

**Note:** \* Available on some models.

#### ■ Removable battery

You can use the computer with battery power whenever ac power is unavailable.

#### ■ Latches

Use the latches to lock or unlock the removable battery.

#### ■ Docking-station hook holes

Use the docking-station hook holes to secure a supported docking station.

#### ■ Fan louvers

The fan louvers and internal fan enable air to circulate in the computer to ensure proper cooling, especially the cooling of the microprocessor.

**Note:** To ensure proper airflow, do not place any obstacles under the fan louvers.

#### ■ Keyboard drainage holes

If you accidentally spill water or drink over the keyboard, the keyboard drainage holes can help drain out liquid from your computer.

#### ■ Speakers

Your computer is equipped with a pair of stereo speakers.

#### ■ Emergency-reset hole

If the computer stops responding and you cannot turn it off by pressing the power button, remove the ac power adapter. Then, insert a straightened paper clip into the emergency-reset hole to reset the computer.

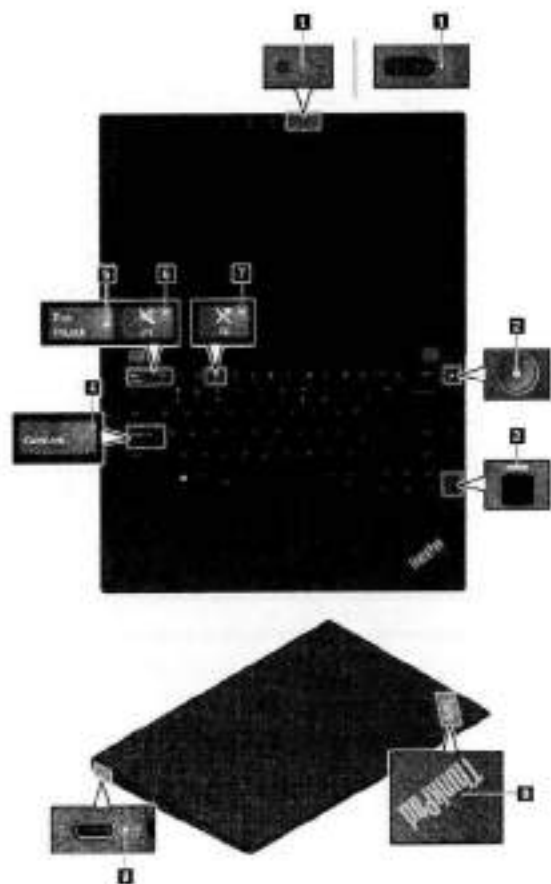
#### ■ Nano-SIM card slot

The nano-SIM-card slot is in the battery compartment. If the computer supports the wireless wide area network (WWAN), a nano Subscriber Identification Module (SIM) card might be required to establish connections. For information about replacing or installing the nano-SIM card, see "Replacing the nano-SIM card" on page 100.

#### Status indicators

This topic provides information about locating and identifying the various status indicators on your computer.

**Note:** Depending on the model, your computer might look different from the following illustrations.



#### Camera status indicator

When this indicator is on, the camera is in use.

#### System status indicators

The indicator in the ThinkPad logo on the computer lid and the indicator in the power button show the system status of your computer.

- **Blinks for three times:** The computer is initially connected to power.
- **On:** The computer is on (in normal mode).
- **Off:** The computer is off or in hibernation mode.

- **Blinks quickly:** The computer is entering sleep or hibernation mode.
- **Blinks slowly:** The computer is in sleep mode.

#### Fingerprint reader indicator

This indicator shows the status of fingerprint reader. For more information, see "Using the fingerprint reader" on page 54.

#### Caps Lock indicator

When this indicator is on, you can type uppercase letters by directly pressing the letter keys.

#### Fn Lock indicator

This indicator shows the status of Fn Lock function. For more information, see "Using the special keys" on page 18.

#### Speaker-mute indicator

When this indicator is on, the speakers are muted.

#### Microphone-mute indicator

When this indicator is on, the microphones are muted.

#### AC power status indicator

This indicator shows the ac power and charging status of the computer.

- **White:** connected to ac power (battery power 90%–100%)
- **Amber:** connected to ac power (battery power 0%–90%)
- **Off:** not connected to ac power

## Important product information

This section provides information to help you locate the following:

- Machine type and model information
- FCC ID and IC Certification information
- Windows operating systems information

### Machine type and model information

When you contact Lenovo for help, the machine type and model information helps the technicians to identify your computer and provide faster service.

The following illustration shows where to find the machine type and model information of your computer.



### FCC ID and IC Certification number

The FCC and IC Certification information is identified by a label on the computer as shown in the following illustration.

**Note:** Depending on the model, your computer might look different from the following illustration.



The content of this label differs depending on the wireless modules that come with your computer:

- For a preinstalled wireless module, this label identifies the actual FCC ID and IC certification number for the wireless module installed by Lenovo.

**Note:** Do not remove or replace a preinstalled wireless module by yourself. For replacement, you must contact Lenovo service first. Lenovo is not responsible for any damage caused by unauthorized replacement.

- For a user-installable wireless WAN module, this label directs you to consult this user guide for the actual FCC ID and IC certification number.

The FCC ID and IC Certification number label is affixed to the wireless WAN module **11** (available on some models) installed in the computer.



**Note:** For the user-installable wireless module, ensure that you use only Lenovo-authorized wireless module for the computer. Otherwise, an error message will be displayed and the computer will beep when you turn on the computer.

### Labels for the Windows operating systems

**Windows® 10 Genuine Microsoft® label:** Your computer might have a Genuine Microsoft label affixed to its cover depending on the following factors:

- Your geographic location
- Date when your computer was manufactured
- Version of Windows 10 that is preinstalled

Go to <https://www.microsoft.com/en-us/hardware/Hardware.aspx> for illustrations of the various types of Genuine Microsoft labels.

- In the People's Republic of China, the Genuine Microsoft label is required on all computer models preinstalled with any version of Windows 10.
- In other countries and regions, the Genuine Microsoft label is required only on computer models licensed for Windows 10 Pro.

The absence of a Genuine Microsoft label does not indicate that the preinstalled Windows version is not genuine. For details on how to tell whether your preinstalled Windows product is genuine, refer to the information provided by Microsoft at:

<https://www.microsoft.com/en-us/hardware/okfaq.aspx>

There are no external, visual indicators of the Product ID or Windows version for which the computer is licensed. Instead, the Product ID is recorded in the computer firmware. Whenever a Windows 10 product is installed, the installation program checks the computer firmware for a valid, matching Product ID to complete the activation.

In some cases, an earlier Windows version might be preinstalled under the terms of the Windows 10 Pro license downgrade rights.



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## Computer features

The computer features introduced in this topic cover various models. Some computer features might be available only on specific models.

### Microprocessor

To view the microprocessor information of your computer, right-click the **Start** button and then select **System**.

### Memory

Double data rate 4 (DDR4) small outline dual in-line memory module (SODIMM)

### Storage device

- 2.5-inch form factor, 7-mm (0.28-inch) height hard disk drive \*
- 2.5-inch form factor, 7-mm (0.28-inch) height Serial Advanced Technology Attachment (SATA) solid-state drive \*
- M.2 solid-state drive \*

### Display

- Brightness control
- Color display with In-Plane Switching (IPS) or Twisted Nematic (TN) technology
- Display size: 355.5 mm (14 inches)
- Display resolution: 1366 x 768 pixels, 1920 x 1080 pixels, or 2560 x 1440 pixels
- Multi-touch technology \*

### Keyboard

- Six-row keyboard (backlight function available on some models)
- Function keys
- ThinkPad pointing device

### Connectors and slots

- Audio connector
- Ethernet connector
- HDMI connector
- Media-card slot
- Two USB-C connectors (one Thunderbolt 3 compatible)
- Two USB 3.1 connectors (one 1, including one Always On USB connector)
- Smart-card slot \*
- Nano-SIM-card slot (inside the battery compartment) \*

### Security features

- Security-lock slot
- Security chip
- Face authentication (available on models with the infrared camera)
- Fingerprint reader \*

- Trusted Platform Module (TPM) \*
- Conventional camera with camera shutter \*

### Wireless features

- Bluetooth
- Wireless LAN
- Global Positioning System (GPS) \*
- NFC \*
- Wireless WAN \*

### Others

- Microphones
- Conventional camera \*

**Note:** \* Available on some models.

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## Computer specifications

### Size

- Width: 336.8 mm (13.25 inches)
- Depth: 232.5 mm (9.15 inches)
- Thickness: 19.95 mm (0.79 inches)

### Maximum heat output (depending on the model)

- 45 W (154 Btu/hr)
- 66 W (222 Btu/hr)

### Power source (ac power adapter)

- Sine-wave input at 60 Hz to 60 Hz
  - Input rating of the ac power adapter: 100 V to 240 V ac, 50 Hz to 60 Hz
- 

## Operating environment

### Maximum altitude (without pressurization)

- 3048 m (10 000 ft)

### Temperature

- At altitudes up to 2438 m (8000 ft)
  - Operating: 5°C to 35°C (41°F to 95°F)
  - Storage: 5°C to 43°C (41°F to 109°F)
- At altitudes above 2438 m (8000 ft)
  - Maximum temperature when operating under the unpressurized condition: 31.2°C (88°F)

**Note:** When you charge the battery, its temperature must be at least 10°C (50°F).

#### Relative humidity

- Operating: 8% to 95% at wet-bulb temperature 23°C (73°F)
- Storage: 5% to 95% at wet-bulb temperature 27°C (81°F)

If possible, place your computer in a well-ventilated and dry area without direct exposure to sunshine.

#### Attention:

- Keep electrical appliances such as electric fans, radio, air conditioners, and microwave ovens away from the computer. The strong magnetic fields generated by these appliances can damage the monitor and data on the internal storage drive.
- Do not place any beverages on top of or beside the computer or other attached devices. If liquid is spilled on or in the computer or an attached device, a short circuit or other damage might occur.
- Do not eat or smoke over your keyboard. Particles that fall into your keyboard can cause damage.

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### Lenovo programs

Your computer comes with Lenovo programs to help you work easily and securely.

#### Accessing Lenovo programs

To access Lenovo programs on your computer, do the following:

1. Open the Start menu and locate a program by the program name.
2. If you do not find the program in the program list, search for the program in the search box.

#### An introduction to Lenovo programs

This topic provides a brief introduction to Lenovo programs. Depending on your computer model, some of the programs might not be available.

The available programs are subject to change without notice. To learn more about the programs and other computing solutions offered by Lenovo, go to:

<http://www.lenovo.com/support>

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#### Hotkey Features Integration

Hotkey Features Integration is a utility package that enables you to select and install utilities specifically for the special keys and buttons on your computer. The special keys and buttons are designed to meet accessibility and usability requirements. Installing related utilities enables full functionality of the special keys and buttons.

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#### Lenovo Companion

Your computer's best features and capabilities should be easy to access and understand. With Lenovo Companion, they are.

Use Lenovo Companion to do the following:

- Optimize your computer performance, monitor your computer health, and manage updates.
- Access your user guide, check warranty status, and view accessories customized for your computer.
- Read how-to articles, explore Lenovo forums, and stay up-to-date on technology news with articles and blogs from trusted sources.
- Configure hardware settings.
- Create and manage your Lenovo ID.

This app is filled with exclusive Lenovo content to help you learn more about what you can do with your Lenovo computer.

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## Chapter 2. Using your computer

This chapter provides information to help you use the various features provided by your computer.

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### Registering your computer

When you register your computer, information is entered into a database, which enables Lenovo to contact you if there is a recall or other severe problem. In addition, some locations offer extended privileges and services to registered users.

When you register your computer with Lenovo, you also will receive the following benefits:

- Quicker service when you call Lenovo for help
- Automatic notification of free software and special promotional offers

To register your computer with Lenovo, go to <http://www.lenovo.com/register> and follow the instructions on the screen.

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### Frequently asked questions

This topic provides a few tips to help you optimize the use of your ThinkPad notebook computers.

To ensure the best computer performance, go to the following Web site to find information such as aids for troubleshooting and answers to frequently asked questions:

<http://www.lenovo.com/support/faq>

#### Can I get my user guide in another language?

To download the user guide in another language, go to <http://www.lenovo.com/support>. Then follow the instructions on the screen.

#### How do I get help about the Windows operating system?

The Windows help information system provides you with detailed information about using the Windows operating system so that you can get the most of your computer. To access the Windows help information system, click the **Start** button to open the Start menu, and then click **Get Help**. Additionally, you can use the Cortana® personal assistant to search for help, apps, files, settings, and so on.

#### How do I access Control Panel?

Click the **Start** button to open the Start menu, and then click **Windows System** → **Control Panel**.

#### How to turn off my computer?

Open the Start menu, click **Power**, and then click **Shut down**.

#### How to partition my storage drive?

To partition the storage drive of your computer in the Windows operating system, refer to <http://support.lenovo.com/solutions/htc02851>.

#### How do I use battery power more effectively when I am on the go?

- To conserve power, or to suspend operation without exiting programs or saving files, see "Power saving modes" on page 26.

- To achieve the best balance between performance and power saving, create and apply an appropriate power plan. See "Managing the battery power" on page 26.
- If your computer will be turned off for an extended period of time, you can prevent battery power from draining by removing the battery.

#### How do I securely dispose of data stored on the internal storage drive?

- Study Chapter 5 "Security" on page 51 to find out how you can protect your computer from theft and unauthorized use.
- Before you dispose of the data on the internal storage drive, ensure that you read "Deleting data from your storage drive" on page 56.

#### How do I attach an external display?

- Refer to "Using an external display" on page 33.
- With the Extend desktop function, you can display output on both the computer display and an external display.

#### How do I attach or replace a device?

Refer to the appropriate topic in Chapter 9 "Replacing devices" on page 97.

#### I have been using the computer for some time already, and is getting slower. What should I do?

- Follow the "General tips for preventing problems" on page 77.
- Diagnose problems yourself by using the preinstalled diagnostic software. See "Diagnosing problems with Lenovo Companion" on page 77.
- Check for recovery solutions in Chapter 6 "Recovery information" on page 66.

#### Print the following topics and keep them with your computer in case you are unable to access this electronic user guide when necessary.

- "Installing the Windows 10 operating system" on page 39
- "Computer stops responding" on page 78
- "Power problems" on page 90

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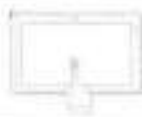






## Using the multi-touch screen




This topic provides instructions on how to use the multi-touch screen that is available on some models.

### Notes:

- Your computer screen might look different from the following illustrations.
- Depending on the program you use, some gestures might not be available.

The following table introduces some frequently used gestures.

Touch gesture (touch models only)	Description
	<p><b>Touch:</b> Tap.</p> <p><b>Mouse action:</b> Click.</p> <p><b>Function:</b> Open an app or perform an action on an open app, such as Copy, Save, and Delete, depending on the app.</p>
	<p><b>Touch:</b> Tap and hold.</p> <p><b>Mouse action:</b> Right-click.</p> <p><b>Function:</b> Open a menu with multiple options.</p>
	<p><b>Touch:</b> Slide.</p> <p><b>Mouse action:</b> Scroll the mouse wheel, move the scroll bar, or click the scroll arrow.</p> <p><b>Function:</b> Scroll through items, such as lists, pages, and photos.</p>
	<p><b>Touch:</b> Drag an item to the location you want.</p> <p><b>Mouse action:</b> Click, hold, and drag an item.</p> <p><b>Function:</b> Move an object.</p>
	<p><b>Touch:</b> Move two fingers closer together.</p> <p><b>Mouse action:</b> Press the Ctrl key while scrolling the mouse wheel backward.</p> <p><b>Function:</b> Zoom out.</p>
	<p><b>Touch:</b> Move two fingers farther apart.</p> <p><b>Mouse action:</b> Press the Ctrl key while scrolling the mouse wheel forward.</p> <p><b>Function:</b> Zoom in.</p>
	<p><b>Touch:</b> Swipe in from the right edge.</p> <p><b>Mouse action:</b> Click the action center icon  in the Windows notification area.</p> <p><b>Function:</b> Open the action center to see your notifications and quick actions.</p>

Touch gesture (touch models only)	Description
	<p><b>Touch:</b> Swipe in from the left edge.</p> <p><b>Mouse action:</b> Click the task view icon  on the taskbar.</p> <p><b>Function:</b> View all your open windows in task view.</p>
	<ul style="list-style-type: none"> <li>• <b>Short swipe for full-screened app or when your computer is in the tablet mode</b></li> </ul> <p><b>Touch:</b> Swipe downwards shortly from the top edge.</p> <p><b>Mouse action:</b> Move your pointer to the top edge of the screen.</p> <p><b>Function:</b> Show a hidden title bar.</p> <ul style="list-style-type: none"> <li>• <b>Long swipe when your computer is in the tablet mode</b></li> </ul> <p><b>Touch:</b> Swipe in from the top edge to the bottom edge.</p> <p><b>Mouse action:</b> From the top edge of the screen, click and hold, move the pointer to the bottom of the screen, and then release.</p> <p><b>Function:</b> Close the current app.</p>

#### Tips on using the multi-touch screen

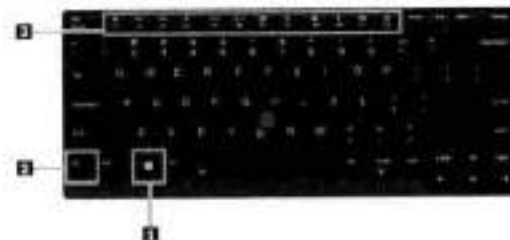
- The multi-touch screen is a glass panel covered with a plastic film. Do not apply pressure or place any metallic object on the screen, which might damage the touch panel or cause it to malfunction.
- Do not use fingernails, gloved fingers, or inanimate objects for input on the screen.
- Regularly calibrate the accuracy of the finger input to avoid a discrepancy.

#### Tips on cleaning the multi-touch screen

- Turn off the computer before cleaning the multi-touch screen.
- Use a dry, soft, and lint-free cloth or a piece of absorbent cotton to remove fingerprints or dust from the multi-touch screen. Do not apply solvents to the cloth.
- Gently wipe the screen using a top-down motion. Do not apply any pressure on the screen.

#### Using the special keys

Your computer has several special keys to help you work more easily and effectively.










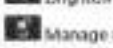



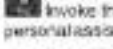
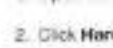

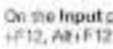

### ■ Windows logo key

Press the Windows logo key to open the Start menu. For information about using the Windows logo key with other keys, see the help information system of the Windows operating system.

### ■ Fn key and function keys

You can configure the Fn key and function keys in the Keyboard Properties window by doing the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Lenovo - Keyboard Manager** and the Keyboard Manager window is displayed.
3. Select the options of your preference.

-  Switch the key function between the standard F1-F12 function and the special function printed as an icon on each key. When the Fn Lock indicator is off, you can use the default function. You can change the default function in the Keyboard Properties window.
-  Mute or unmute the speakers. When the speakers are muted, the indicator on the key is on. If you mute the sound and turn off your computer, the sound will remain muted when you turn on your computer. To turn on the sound, press  or .
-  Decrease the speaker volume.
-  Increase the speaker volume.
-  Mute or unmute the microphones. When the microphones are muted, the indicator on the key is on.
-  Darken the computer display.
-  Brighten the computer display.
-  Manage external displays.
-  Enable or disable the built-in wireless features.
-  Open the Settings window.
-  Enable or disable the built-in Bluetooth features.
-  Open a keyboard setting page.
-  Invoke the function defined by yourself. If no function is defined, press this key to open the Cortana personal assistant. To define or change the function, do the following:
  1. Open the Start menu and click the **Lenovo Companion** program.
  2. Click **Hardware Settings** and then click the input icon .
  3. Locate the **Keyboard: User-defined Key** section and follow the instructions on the screen to complete the setting.

On the **Input** page, you can also define different functions for the key combinations with F12, such as Shift+F12, Alt+F12, or Ctrl+F12.

### Key combinations

-  Open the Snipping Tool program.

- **Fn+B**: The Break key
- **Fn+K**: The SoftK or Scroll Lock key
- **Fn+P**: The Pause key
- **Fn+S**: The SysRq key
- **Fn+Left Arrow key**: The Home key
- **Fn+Right Arrow key**: The End key
- **Fn+I**: Put the computer into sleep mode. To wake up the computer, press the Fn key or the power button.
- **Fn+Spacebar**: If your computer supports keyboard backlight, press Fn+Spacebar to switch between the different keyboard backlight status.

## Using the ThinkPad pointing device

This section provides information about using the ThinkPad pointing device.

### ThinkPad pointing device overview

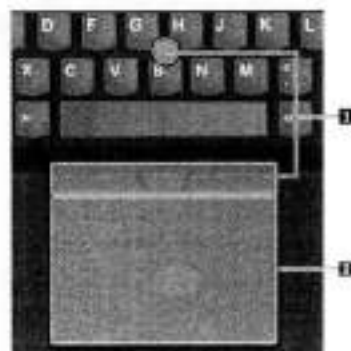
The ThinkPad pointing device enables you to perform all the functions of a traditional mouse, such as pointing, clicking, and scrolling. With the ThinkPad pointing device, you also can perform various touch gestures, such as rotating and zooming in or out.

The ThinkPad pointing device consists of the following devices:

#### ■ TrackPoint pointing device

#### ■ Trackpad

**Note:** Depending on the model, your TrackPoint pointing device and the trackpad might look different from the illustration in this topic.



By default, both the TrackPoint pointing device and the trackpad are active with the touch gestures enabled. To change the settings, see "Customizing the ThinkPad pointing device" on page 23.

## Using the TrackPoint pointing device

The TrackPoint pointing device enables you to perform all the functions of a traditional mouse, such as pointing, clicking, and scrolling.

The TrackPoint pointing device consists of the following components:

- Pointing stick
- Left-click button (primary-click button)
- Right-click button (secondary-click button)
- Scroll bar



To use the TrackPoint pointing device, see the following instructions:

**Note:** Place your hands in the typing position and use your index finger or middle finger to apply pressure to the pointing-stick nonslip cap. Use either thumb to press the left-click button or right-click button.

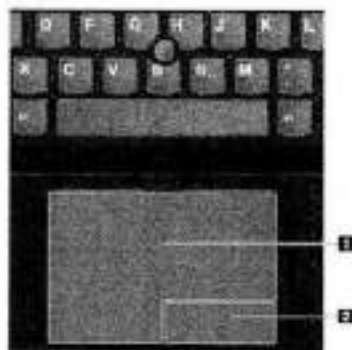
- **Point**  
Use the pointing stick ■ to move the pointer on the screen. To use the pointing stick, apply pressure to the pointing-stick nonslip cap in any direction parallel to the keyboard. The pointer moves accordingly but the pointing stick itself does not move. The speed at which the pointer moves depends on the amount of pressure you apply to the pointing stick.
- **Left-click**  
Press the left-click button ■ to select or open an item.
- **Right-click**  
Press the right-click button ■ to display a shortcut menu.
- **Scroll**  
Press and hold the dotted scroll bar ■ while applying pressure to the pointing stick in the vertical or horizontal direction. Then you can scroll through the document, Web site, or apps.

## Using the trackpad

The entire trackpad surface is sensitive to finger touch and movement. You can use the trackpad to perform all the pointing, clicking, and scrolling functions of a traditional mouse.

The trackpad can be divided into two zones:

- Left-click zone (primary-click zone)
- Right-click zone (secondary-click zone)



To use the trackpad, see the following instructions:

- **Point**  
Slide one finger across the surface of the trackpad to move the pointer accordingly.
- **Left-click**  
Press the left-click zone ■ to select or open an item.  
You also can tap anywhere on the surface of the trackpad with one finger to perform the left-click action.
- **Right-click**  
Press the right-click zone ■ to display a shortcut menu.  
You also can tap anywhere on the surface of the trackpad with two fingers to perform the right-click action.
- **Scroll**  
Put two fingers on the trackpad and move them in the vertical or horizontal direction. This action enables you to scroll through the document, Web site, or apps. Ensure that you position your two fingers slightly apart from each other.

With the trackpad, you also can perform a variety of touch gestures. For information about using the touch gestures, see "Using the trackpad touch gestures" on page 23.

If the trackpad surface is stained with oil, turn off the computer first. Then gently wipe the trackpad surface with a soft and lint-free cloth moistened with lukewarm water or computer cleaner.

## Using the trackpad touch gestures

The entire trackpad surface is sensitive to finger touch and movement. You can use the trackpad to perform the same point and click actions as you would use a traditional mouse. You also can use the trackpad to perform various touch gestures.

The following section introduces some frequently used touch gestures such as tapping, dragging, and scrolling. For more gestures, see the help information system of the ThinkPad pointing device.

### Notes:

- When using two or more fingers, ensure that you position your fingers slightly apart.
- Some gestures are not available if the last action was done from the TrackPoint pointing device.
- Some gestures are only available when you are using certain apps.
- Depending on the model, the trackpad on your computer might look different from the illustrations in this topic.



#### Tap

Tap anywhere on the trackpad with one finger to select or open an item.



#### Two-finger tap

Tap anywhere on the trackpad with two fingers to display a shortcut menu.



#### Two-finger scroll

Put two fingers on the trackpad and move them in the vertical or horizontal direction. This action enables you to scroll through the document, Web site, or apps.



#### Two-finger zoom out

Put two fingers on the trackpad and move them closer together to zoom out.



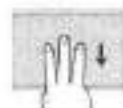
#### Two-finger zoom in

Put two fingers on the trackpad and move them farther apart to zoom in.



#### Swipe three fingers up

Put three fingers on the trackpad and move them up to open the task view to see all your open windows.



#### Swipe three fingers down

Put three fingers on the trackpad and move them down to show the desktop.


## Customizing the ThinkPad pointing device

You can customize the ThinkPad pointing device so you can use it more comfortably and efficiently. For example, you can choose to enable the TrackPoint pointing device, the trackpad, or both. You also can disable or enable the touch gestures.


To customize the ThinkPad pointing device, do the following:

1. Go to Control Panel.
2. View Control Panel by Large icons or Small icons. Click **Mouse**. The Mouse Properties window is displayed.
3. In the Mouse Properties window, follow the instructions on the screen to complete the customization.

## Replacing the cap on the pointing stick

The cap  on the end of the pointing stick is removable. After you use the cap for a period of time, you might consider replacing the cap with a new one.

### Notes:

- Ensure that you use a cap with grooves  as shown in the following illustration.
- Depending on the model, your keyboard might look different from the illustration in this topic.



## Power management

This section provides information about how to use ac power and battery power to achieve the best balance between performance and power management.

### Using the ac power adapter

The power to run your computer can come either from the battery or from ac power. While you use ac power, the battery charges automatically.

Your computer comes with an USB-C type ac power adapter and a power cord.

- **ac power adapter:** Converts ac power for notebook computer use.
- **Power cord:** Connects the ac outlet and the ac power adapter.

#### Connecting the ac power adapter

To connect the computer to ac power, ensure that you follow the steps in order:

**Attention:** Using an improper power cord might severely damage your computer.

1. Connect the power cord to the ac power adapter.
2. Connect the ac power adapter to one of the USB-C connectors of the computer.
3. Connect the power cord to an electrical outlet.

#### Tips on using the ac power adapter

- When the ac power adapter is not in use, disconnect it from the electrical outlet.
- Do not bind the power cord tightly around the ac power adapter transformer pack when it is connected to the transformer.

## Using the battery

When you use your computer away from electrical outlets, you depend on battery power to keep your computer running. Different computer components consume power at different rates. The more you use the power-intensive components, the faster you consume battery power.

Spend more time unplugged with ThinkPad batteries. Mobility has revolutionized business by enabling you to take your work wherever you go. With ThinkPad batteries, you are able to work longer without being tied to an electrical outlet.

### Checking the battery status

Move your pointer to the battery status icon in the Windows notification area to check the battery status. The battery status icon displays the percentage of battery power remaining and how long you can use your computer before you must charge the battery.

The rate at which you use battery power determines how long you can use the battery of your computer between charges. Because every computer user has individual habits and needs, it is difficult to predict how long a battery charge lasts. There are two main factors:

- How much energy is stored in the battery when you begin to work.
- The way you use your computer, for example:
  - How often you access the storage drive
  - How bright you make the computer display
  - How often you use the wireless features

### Charging the battery

When you find that the remaining battery power is low, charge your battery or replace the battery with a charged battery.

If an ac outlet is convenient, connect the computer to ac power. The battery is fully charged in about four to eight hours. The actual charging time depends on the battery size, the physical environment, and whether you are using the computer. You can check the battery charging status at any time through the battery status icon in the Windows notification area.

**Note:** To maximize the life of the battery, the computer does not start recharging the battery if the remaining power is greater than 95%.

### Tips on charging the battery

- Before you charge the battery, assure that the battery temperature is higher than 10°C (50°F) and lower than 35°C (95°F).
- Charge the battery in any of the following conditions:
  - A new battery is installed.
  - The percentage of power remaining is low.
  - The battery has not been used for a long time.

### Maximizing the battery life

To maximize the life of the battery, do the following:

- Use the battery until the charge is depleted.
- Recharge the battery completely before using it. You can see whether the battery is fully charged from the battery status icon in the Windows notification area.

- Always use power management features such as power-saving modes.

## Managing the battery power

To achieve the best balance between performance and power saving, adjust your power plan settings. To adjust power plan settings, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options**.
3. Follow the instructions on the screen.

For more information, see the Windows help information system.

## Power-saving modes

There are several modes that you can use at any time to conserve power. This section introduces each mode and gives tips on the effective use of battery power.

### • Sleep mode

In sleep mode, your work is saved to memory, and then the storage drive and the computer display are turned off. When your computer wakes up, your work is restored within seconds.

To put your computer to sleep mode, open the Start menu, click  **Power**, and then click **Sleep**.

### • Hibernation mode

By using this mode, you can turn off your computer completely without saving files or exiting any programs that are running. When the computer enters hibernation mode, all open programs, folders, and files are saved to the storage drive, and then the computer turns off.

To put the computer to hibernation mode, define what the power button does first, and then press the power button to put the computer to hibernation mode.

If you put your computer to hibernation mode with the wake-up function disabled, the computer does not consume any power. The wake-up function is disabled by default. If you put your computer to hibernation mode with the wake-up function enabled, the computer consumes a small amount of power.

To enable the wake-up function, do the following:

1. Open Control Panel, view Control Panel by Category, and then click **System and Security**.
2. Click **Administrative Tools**.
3. Double-click **Task Scheduler**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. From the left pane, select the task folder for which you want to enable the wake-up function. The scheduled tasks are displayed.
5. Click a scheduled task, and then click the **Conditions** tab.
6. Under **Power**, select **Wake the computer to run this task**.

### • Wireless off

When you are not using the wireless features, such as Bluetooth or wireless LAN, turn them off to help conserve power.

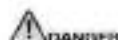
## Cabled Ethernet connections

With an Ethernet cable, you can connect your computer to a local network through the Ethernet connector on your computer.



The Ethernet connector has two network status indicators. When the green indicator is on, the computer is connected to a LAN. When the yellow indicator blinks, data is being transmitted.

**Note:** If the computer is connected to a supported docking station or a supported dock, use the Ethernet connector on the docking station or the dock (instead of the one on the computer).



Your computer has an Ethernet connector. To avoid the risk of electrical shock, do not connect the telephone cable to the Ethernet connector.

## Wireless connections

Wireless connection is the transfer of data without the use of cables but by means of radio waves only.

### Using the wireless-LAN connection

A wireless local area network (LAN) covers a relatively small geographic area, such as an office building or a house. Devices based on the 802.11 standards can connect to this type of network.

Your computer comes with a built-in wireless network card to help you establish wireless connections and monitor the connection status.

To establish a wireless-LAN connection, do the following:

1. Turn on the wireless feature. Press **F5**.
2. Click the wireless-network-connection-status icon in the Windows notification area. A list of available wireless networks is displayed.
3. Double-click a network to connect to it. Provide required information if needed.

The computer automatically connects to an available and remembered wireless network when the location changes. If the available wireless network is secured, provide the password as required. For more information, see the Windows help information system.

#### Tips on using the wireless-LAN feature

To achieve the best connection, use the following guidelines:

- Place your computer so that there are as few obstacles as possible between the wireless-LAN access point and the computer.
- Open your computer cover to an angle of slightly more than 90 degrees.

#### Checking the wireless-LAN connection status

You can check the wireless-LAN connection status through the wireless-network-connection-status icon in the Windows notification area. The more bars encompassed, the better the signal is.

### Using the wireless-WAN connection

Wireless wide area network (WAN), which uses cellular networks for data transmission, enables you to establish wireless connections over remote public or private networks. These connections can be maintained over a large geographical area by use of multiple antenna sites or satellite systems maintained by wireless service providers.

Some ThinkPad notebook computers come with a wireless-WAN card installed, which provides some wireless-WAN technologies, such as 1xEV-DO, HSPA, 3G, 4G, GPRS, or LTE. By using the wireless-WAN card, you can establish wireless-WAN connections.

**Note:** The wireless-WAN service is provided by authorized service providers in some countries or regions.

#### Tips for using the wireless-WAN feature

To achieve the best connection, use the following guidelines:

- Keep your computer away from your body.
- Place your computer on a flat surface and open your computer display to an angle of slightly more than 90 degrees.
- Place your computer away from concrete or brick walls that might dampen cellular signals.
- Best reception is available near windows and other locations where cellular phone reception is the strongest.

#### Checking the wireless-WAN connection status

You can check the wireless-WAN connection status through the wireless-network-connection-status icon in the Windows notification area. The more bars encompassed, the better the signal is.

### Using the Bluetooth connection

Bluetooth can connect devices that are within a short distance from one another. Bluetooth is commonly used in the following scenarios:

- Connecting peripheral devices to a computer
- Transferring data between hand-held devices and a personal computer
- Remotely controlling and communicating with devices such as mobile phones


Depending on the model, your computer might support the Bluetooth feature. To transfer data through the Bluetooth feature, do the following:

**Note:** It is not recommended to use the wireless feature (the 802.11 standards) of your computer simultaneously with a Bluetooth option. The data transmission speed can be delayed and the performance of the wireless feature can be degraded.

1. Do one of the following:
  - Press the Bluetooth-control key **F5** and turn on the Bluetooth feature.
  - Open the Start menu, and then click **Settings → Devices → Bluetooth & other devices**. Turn on the **Bluetooth** switch to enable the Bluetooth feature.
2. Right-click the data that you want to send.
3. Select **Send To → Bluetooth Devices**.
4. Select a Bluetooth device, and then follow the instructions on the screen.

For more information, see the Windows help information system and the help information system of the Bluetooth device.

### Using the NFC devices

If your computer supports the near field communication (NFC) feature, you will see an NFC icon or label  around the trackpad area.

NFC is a high-frequency and short-range wireless communication technology. By using NFC, you can establish the radio communications between your computer and another NFC-enabled device over a few centimeters or inches.

This section provides instructions on how to pair your computer with an NFC device. For more information about data transfer, see the documentation of the NFC device.

#### Attention:

- Before handling the NFC card, touch a metal table or a grounded metal object. Otherwise the card might get damaged by the static electricity from your body.
- During the data transfer, do not put your computer or NFC-enabled smartphone to sleep mode; otherwise, your data might get damaged.

#### Enabling the NFC feature

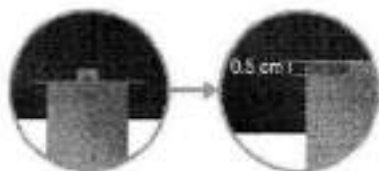
By default, the NFC feature is enabled. If the NFC feature of your computer is disabled, do the following to enable the NFC feature:

1. Open the Start menu and then click **Settings** → **Network & Internet** → **Airplane mode**.
2. Turn off the Airplane mode.
3. Turn on the NFC function.

#### Pairing your computer with an NFC card

Before you start, ensure that the card is in NFC Data Exchange Format (NDEF), otherwise the card cannot be detected. Then do the following:

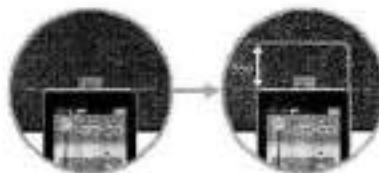
1. Position the card closely above the NFC label as shown. Align the shorter edge of the card with the horizontal extension line for the center of the NFC label.
2. Slowly move the card a distance within 0.5 cm (0.20 inches) to the direction of the computer display. Then hold the card for seconds until you are prompted that the card has been successfully detected.



#### Pairing your computer with an NFC-enabled smartphone

Before you start, ensure that the smartphone screen is facing upward. Then do the following:

1. Position the smartphone closely above the NFC label as shown. Align the shorter edge of the smartphone with the horizontal extension line for the center of the NFC label.
2. Slowly move the smartphone a distance within 5 cm (1.97 inches) to the direction of the computer display. Then hold the smartphone for seconds until you are prompted that the smartphone has been successfully detected.



#### Using the Airplane mode

The Airplane mode is supported on the Windows 10 operating system. If the Airplane mode is enabled, all wireless features are disabled.

To enable or disable the Airplane mode, do the following:

1. Open the Start menu.
2. Click **Settings** → **Network & Internet** → **Airplane mode**.
3. Slide the control for **Airplane mode** to turn it on or off.

#### Using audio features

Your computer is equipped with the following items:

- Audio connector, 3.5 mm (0.14 inches) in diameter
- Microphones
- Speakers

Your computer also has an audio chip that enables you to enjoy various multimedia audio features, such as the following:

- Compliant with High Definition Audio
- Playback of MIDI and MP3 files
- Recording and playback of PCM and WAV files
- Recording from various sound sources, such as a headset attached

The following list provides information about supported functions of the audio devices attached to the connectors on your computer or the docking station.

- **Headset with a 3.5-mm (0.14-inch), 4-pole plug:** Headphone and microphone functions
- **Conventional headphone:** Headphone function

**Note:** The conventional microphone is not supported.

## Using the cameras

Depending on models, your computer might be equipped with a conventional camera with camera shutter or an infrared camera.

### Using the conventional camera with camera shutter

To use the conventional camera to take pictures and record videos, slide the camera shutter to the left to unveil the camera lens first. Then open the Start menu and click **Camera** from the program list. If you use other programs that provide features such as photographing, video capturing, and video conferencing, the camera starts automatically when you enable the camera-required features. When the camera starts, the camera status indicator nearby turns white, indicating that the camera is in use. If you want to cover the camera lens, slide the camera shutter to the right.

If you want to configure the camera settings, open the Start menu and then click **Lenovo Companion** → **Hardware Settings** → **Display, Camera & Audio/Media**. Locate the **Camera** section and then follow the instructions on the screen to configure the camera settings.

### Using the infrared camera

The infrared camera provides a personal and secure way for you to sign in to your computer with face authentication. After setting the infrared camera for face authentication, you can unlock your computer by scanning your face instead of using a password.

The infrared camera has the following components:



#### 1 Infrared light-emitting diode (LED)

The infrared LED emits infrared light. Normally the infrared light is invisible to the naked eye.

#### 2 Infrared camera lens

The infrared camera lens is used for creating the facial image of a user.

#### 3 Camera indicator

When the camera indicator is on, the infrared camera is in the recognition mode.

To set the infrared camera for face authentication, do the following:

1. Open the Start menu and click **Settings** → **Accounts** → **Sign-in options**.
2. Scroll down to the **Password** section and click **Add** to create a password.
3. Follow the instructions on the screen to create a Personal Identification Number (PIN).
4. Locate the **Windows Hello** section and click **Set up** under **Face Recognition**. Then click **Get Started**.

5. Enter the PIN you have set earlier. The camera preview starts.
6. Follow the instructions on the screen to complete the setup.
7. Click **Improve Recognition** to improve the image so that **Windows Hello** can recognize you in different light conditions or when your appearance changes.

To use the infrared camera to unlock your computer, do the following:

1. On the Windows lock screen, select the smiling face icon from the sign-in options.
2. Follow the instructions on the screen and ensure that you are centered and looking directly at the camera. When the program recognizes your face, it automatically unlocks the screen and signs you in to the Windows operating system.

## Using a media card or a smart card

Your computer has a media-card slot. Depending on the model, your computer might also have a smart-card slot.

### Supported media card types

The media-card reader on your computer only supports the following media cards:

**Note:** Your computer does not support the content protection for recordable media (CPRM) feature for the SD card.

- MultiMediaCard (MMC)
- Secure Digital (SD) card
- Secure Digital eXtended-Capacity (SDXC) card
- Secure Digital High-Capacity (SDHC) card

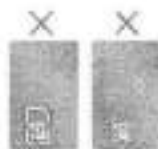
### Supported smart card type

You can use smart cards for authentication, data storage, and application processing. Within large organizations, you might also use smart cards for strong security authentication of single sign-on (SSO). The smart-card reader on your computer only supports the smart card of the following specifications:



- Length: 85.60 mm (3.37 inches)
- Width: 55.98 mm (2.21 inches)
- Thickness: 0.76 mm (0.03 inches)

**Attention:** Smart cards with keys are not supported. Do not insert such a smart card into the smart-card reader of your computer. Otherwise the reader might get damaged.



### Installing a media card or a smart card

**Attention:** Before you start installing a card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. Static electricity could damage the card.

To install the card, do the following:

1. Locate the appropriate type of slot for your card. See "Computer controls, connectors, and indicators" on page 1.
2. Ensure that the card is correctly oriented:
  - For the media card: The metal contacts are facing down and pointing toward the card slot.
  - For the smart card: The metal contacts are facing upward and pointing toward the card slot.
3. Press the card firmly into the card slot.

If the plug-and-play feature is not enabled for the installed media card or smart card, do the following to enable the feature:

1. Go to Control Panel.
2. View Control Panel by Category. Click **Hardware and Sound**.
3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. From the Action menu, select **Add legacy hardware**. The Add Hardware Wizard starts.
5. Follow the instructions on the screen.

### Removing a media card or a smart card

**Attention:**

- Before removing a card, stop the card first. Otherwise, data on the card might get corrupted or lost.
- When transferring data to or from a media card or a smart card, do not put your computer to sleep or hibernation mode before the data transfer is completed; otherwise, your data might get damaged.
- Do not remove a card when the computer is in sleep mode or hibernation mode. Otherwise, the system might not respond when you try to resume operation.

To remove a card, do the following:

1. Click the triangular icon in the Windows notification area to show hidden icons. Then, right-click the **Safely Remove Hardware and Eject Media** icon.
2. Select the corresponding item to eject the card from the Windows operating system.
3. Press the card to eject it from your computer.
4. Remove the card and store it safely for future use.

**Note:** If you do not remove the card from your computer after you eject the card from the Windows operating system, the card can no longer be accessed. To access the card, you must remove it first, and then insert it again.

### Using an external display

This section provides instructions on how to connect an external display, choose display modes, and change display settings.

You can use an external display such as a projector or a monitor to give presentations or to expand your workspace.

Your computer supports the following video resolution, if the external display also supports that resolution.

- Up to 4096 x 2304 pixels / 60 Hz, with an external display connected to the USB-C connector or the USB-C connector (Thunderbolt 3 compatible)
- Up to 4096 x 2160 pixels / 30 Hz with an external display connected to the HDMI connector

For more information about the external display, see the manuals that come with it.

#### Connecting an external display




You can use either a wired display or a wireless display. The wired display can be connected to a video connector such as the HDMI connector and the USB-C connector by a cable. The external display connected to the USB-C connector and the external display connected to the HDMI connector cannot be used simultaneously. The wireless display can be added through the Miracast<sup>®</sup> function.

##### • Connecting a wired display

**Note:** When you connect an external monitor, a video interface cable with a ferrite core is required.

1. Connect the external display to an appropriate video connector on your computer, such as the HDMI connector or the USB-C connector.
2. Connect the external display to an electrical outlet.
3. Turn on the external display.

If your computer cannot detect the external display, right-click on the desktop, and then click **Screen resolution/Display settings** → **Detect**.


Do not connect external displays to the USB-C connector  and the HDMI connector  at the same time. Otherwise, only the external display connected to the USB-C connector  will work by default. You can change the priority between the USB-C connector and the HDMI connector from the ThinkPad Setup program. To start the ThinkPad Setup program, see "Configuring ThinkPad Setup" on page 61. For more information, see **Shared Display Priority** in "Config menu" on page 63.



##### • Connecting a wireless display


**Note:** To use a wireless display, ensure that both your computer and the external display support the Miracast feature.

Do one of the following:

- Open the Start menu, and then click **Settings** → **Devices** → **Connected devices** → **Add a device**.
- Click the action center icon  in the Windows notification area. Click **Connect**. Select the wireless display and follow the instructions on the screen.

For more information, see the Windows help information system.

### Choosing a display mode

You can display your desktop and apps on the computer display, the external display, or both. To choose how to display the video output, press the display-mode switching key  and then select a display mode you prefer.

There are four display modes:

- **PC screen only:** Displays the video output only on your computer screen.

**Note:** Depending on the situation, you might see **Disconnect, PC screen only**, **Computer only** or **Disconnect projector**.

- **Duplicate:** Displays the same video output on both your computer screen and an external display.
- **Extend:** Extends the video output from your computer display to an external display. You can drag and move items between the two displays.
- **Second screen only:** Shows the video output only on an external display.

**Note:** Depending on the situation, you might see **Projector only** or **Second screen only**.

If you show programs using DirectDraw or Direct3D® in full-screen mode, only the main display shows the video output.

### Changing display settings

You can change the settings for both the computer display and the external display. For example, you can define which one is the main display and which one is the secondary display. You also can change the resolution and orientation.

To change display settings, do the following:

1. Right-click on the desktop and select **Display settings (Windows 10)**.
2. Select the display that you want to configure.
3. Change display settings as you want.

**Note:** If you set a higher resolution for the computer display than the external display, only part of the screen can be shown on the external display.

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## Traveling with your computer

This topic provides information to help you work with your computer when you are traveling.

Use the following travel tips to travel more confidently and efficiently with your computer.

- When your computer goes through the x-ray machines at airport security stations, it is important to keep your eyes on the computer at all times to prevent theft.
- Consider bringing an electrical adapter for use on an airplane or automobile.
- If you carry an ac power adapter, detach the ac cord from it to avoid damaging the cord.

### Travel tips on airplanes

If you carry your computer onto an airplane, observe the following tips:

- Be careful about the seat in front of you on airplanes. Angle your computer display so that it does not get caught when the person in front of you leans back.
- When taking off, remember to turn off your computer or put it to hibernation mode.

- If you intend to use your computer or wireless services (such as Internet and Bluetooth), check with the airline for restrictions and availability of services before boarding the airplane. If there are restrictions on the use of computers with wireless features on the airplane, you must abide by those restrictions.

The Airplane mode is supported on the Windows 10 operating system. In the Airplane mode, all wireless features are disabled.

To enable the Airplane mode, do the following:

1. Open the Start menu, and then click **Settings → Network & Internet → Airplane mode**.
2. Slide the **Airplane mode** control to turn it on.

### Travel accessories

If you are traveling to another country or region, you might want to consider an appropriate ac power adapter for the country or region to which you are traveling.

To purchase travel accessories, go to:

<http://www.lenovo.com/accessories>

## Chapter 3. Enhancing your computer

This chapter provides instructions on how to use hardware devices to expand your computer capabilities.

### Finding ThinkPad options

If you want to expand the capabilities of your computer, Lenovo has a number of hardware accessories and upgrades to meet your needs. Options include memory modules, storage devices, network cards, port replicators or docking stations, batteries, power adapters, keyboards, mice, and more.

To shop at Lenovo, go to:

<http://www.lenovo.com/essentials>

### ThinkPad Basic Docking Station, ThinkPad Pro Docking Station, and ThinkPad Ultra Docking Station

This section introduces how to use the ThinkPad Basic Docking Station, ThinkPad Pro Docking Station, and ThinkPad Ultra Docking Station.

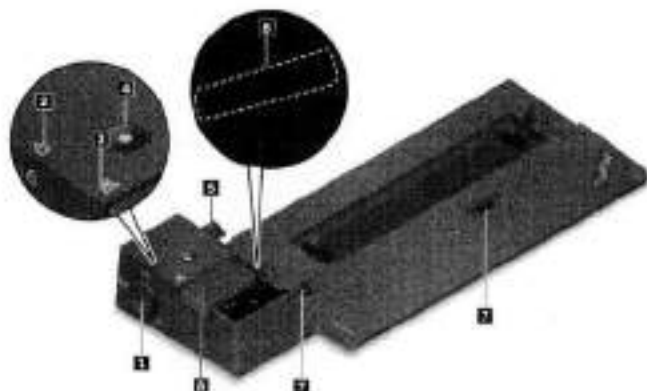
#### Locating controls, connectors, and indicators

This section introduces the locations of controls, connectors, and indicators on the docking stations.




**Note:** When your computer is attached to the docking station, always use the Ethernet connector and the external display connectors on the docking station. Do not use the ones on the computer.

##### Front view

**Note:** The following illustration is based on ThinkPad Basic Docking Station. The ThinkPad Pro Docking Station and ThinkPad Ultra Docking Station might look slightly different.



**System lock:** Use the system lock in the following ways:

- When the system lock is in the locked position , the latch is locked, and you cannot attach or detach your computer.
- When the system lock is in the unlocked position , the latch is unlocked, and you can attach or detach your computer.
- When the system lock is in the unlocked position , you can remove the system lock from the system-lock slot.

**Note:** The ThinkPad Basic Docking Station does not ship with a system lock installed. You can purchase a system lock from Lenovo at <http://www.lenovo.com/essentials>.

**Key lock indicator:** This indicator turns on when the system lock key is in the locked position.

**Docking status indicator:** This indicator turns on when your computer is successfully connected to the docking station.

**Power button:** Press the power button to turn on or turn off the computer attached to the docking station.

**Guide post:** Use the guide post to help you position your computer properly when you attach the computer to the docking station.

**Docking-station connector:** Connect the computer to the docking station.

**Hook:** Hold and secure the computer to the docking station.

**Latch:** Slide the latch to attach or detach the computer.

##### Rear view



Figure 1. ThinkPad Basic Docking Station



Figure 2. ThinkPad Pro Docking Station



Figure 3. ThinkPad Ultra Docking Station

■ **Audio connector:** Connect headphones or a headset with a 3.5-mm (0.14-inch), 4-pole plug.

■ **ac power connector:** Connect the ac power adapter.

■ **DisplayPort® connector:** Connect a high-performance monitor, a direct-drive monitor, or other devices that use a DisplayPort connector.

■ **VGA connector:** Connect the computer to a VGA-compatible video device, such as a VGA monitor.

■ **USB 2.0 connector, ■ USB 3.1 connector Gen 1:** Connect USB-compatible devices, such as a USB keyboard, a USB mouse, a USB storage device, or a USB printer.

■ **Always On USB 3.1 connector Gen 1, ■ Always on USB 3.1 connector Gen 2:** Connect USB-compatible devices and charge some mobile digital devices and smartphones when your computer is in sleep or hibernation mode.

■ **Ethernet connector:** Connect the docking station to an Ethernet LAN.

■ **Security-lock slot:** Lock your docking station to a desk, table, or other non-permanent fixture to protect your docking station from theft. Use a security cable lock that fits this security-lock slot.

■ **USB-C connector:** Use the connector to transfer data, charge your device, or connect to external displays with an appropriate USB-C cable connected.

■ **HDMI connector:** Connect a compatible digital audio device or video monitor, such as a DVD player or an HDTV.

■ **USB 3.1 connector Gen 2:** With greater data transfer rate and faster charging speed, the USB 3.1 connector Gen 2 is used to connect USB-compatible devices, such as a USB keyboard, a USB mouse, a USB storage device, or a USB printer.

## Attaching your computer to a docking station

### Notes:

- The ThinkPad Basic Docking Station does not ship with a system lock installed. If you do not purchase and install a system lock, skip step 4 and step 7 in the following instruction to attach your computer to the ThinkPad Basic Docking Station.
- If you attach the computer to the docking station, but do not connect the docking station to ac power, your computer consumes battery power.

To attach your computer to a docking station, do the following:

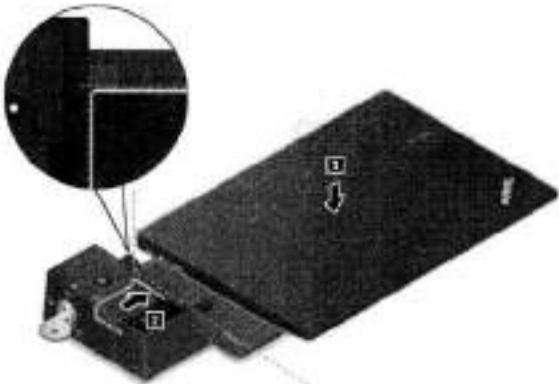
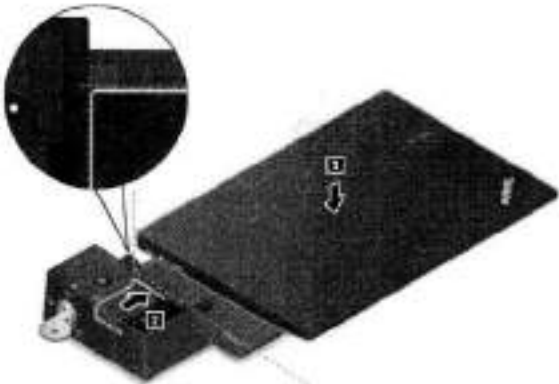
1. Connect the docking station to ac power.
2. Disconnect the cables and devices from the left side of the computer.

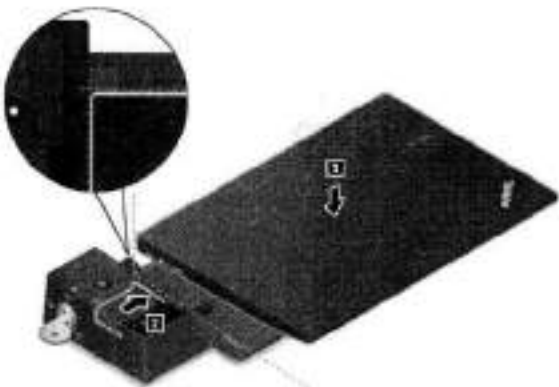
3. Remove the cover from your computer as shown.



4. Ensure that you turn the system lock key to the unlocked position (↑).



5. Align the top-left corner of the computer with the guide post of the docking station. Attach your computer to the docking station as shown  until you hear a click. Slide the latch in the direction as shown .



6. Check the docking status indicator. The docking status indicator turns on when the computer is successfully docked.

**Note:** If the indicator is off, your computer is not attached to the docking station successfully. To solve the problem, detach and reattach the computer.

7. Turn the system lock key to the locked position .



**Attention:** When the computer is attached to a docking station, do not pick up the assembly by taking hold of the computer only. Always hold the whole assembly. Otherwise the docking station might drop down.

### Detaching your computer from a docking station

To detach your computer from a docking station, do the following:

**Note:** The ThinkPad Basic Docking Station does not ship with a system lock installed. If you do not purchase and install a system lock, skip step 1 in the following instruction to detach your computer from the ThinkPad Basic Docking Station.

1. Turn the system lock key to the unlocked position .



2. Slide the latch in the direction as shown  to release the computer, and then grasp both sides of the computer to remove it .



### Guidelines on connecting multiple external displays

You can connect multiple external displays to a supported ThinkPad docking station. To ensure that the multiple displays work correctly, observe the following guidelines and connect the external displays to the appropriate connectors.



#### ThinkPad Basic Docking Station

Up to two external displays connected to the DisplayPort and the VGA connectors can work at the same time.



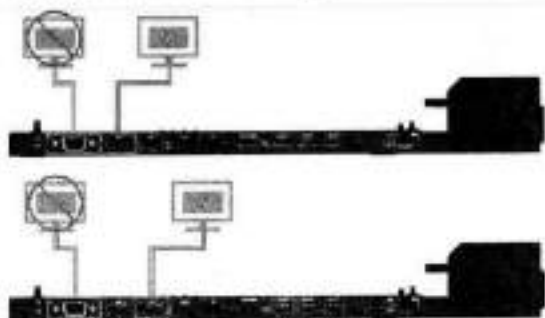
#### ThinkPad Pro Docking Station

Up to two external displays connected to the two DisplayPort connectors can work at the same time.



#### ThinkPad Ultra Docking Station

- Do not connect multiple external displays to the VGA and DisplayPort connectors at the same time. Otherwise, only the external display connected to the DisplayPort connector will work.



- Up to three external displays connected to the two DisplayPort connectors and the HDMI connector can work at the same time.



## Chapter 4. Accessibility, ergonomic, and maintenance information

This chapter provides information about accessibility, ergonomic, and cleaning and maintenance.

### Accessibility information

Lenovo is committed to providing users who have hearing, vision, and mobility limitations with greater access to information and technology. This section provides information about the ways these users can get the most out of their computer experience. You also can get the most up-to-date accessibility information from the following Web site:

<https://www.lenovo.com/accessibility>

#### Keyboard shortcuts

The following list contains keyboard shortcuts that can help make your computer easier to use.

**Note:** Depending on your keyboard, some of the following keyboard shortcuts might not be available.

- **Windows logo key + U:** Open Ease of Access Center
- **Right Shift for eight seconds:** Turn on or turn off Filter Keys
- **Shift five times:** Turn on or turn off Sticky Keys
- **Num Lock for five seconds:** Turn on or turn off Toggle Keys
- **Left Alt+Left Shift+Num Lock:** Turn on or turn off Mouse Keys
- **Left Alt+Left Shift+PrtScn (or PrtSc):** Turn on or turn off High Contrast

For more information, go to <https://windows.microsoft.com/>, and then search using any of the following keywords: keyboard shortcuts, key combinations, shortcut keys.

#### Ease of Access Center

Ease of Access Center on the Windows operating system enables you to configure your computers to suit their physical and cognitive needs.

To access Ease of Access Center, do the following:

1. Go to Control Panel, and ensure that you view Control Panel using Category.
2. Click **Ease of Access → Ease of Access Center**.
3. Choose the appropriate tool by following the instructions on the screen.

Ease of Access Center mainly includes the following tools:

- **Magnifier**  
Magnifier is a useful utility that enlarges the entire screen or part of the screen so that you can see the items better.
- **Narrator**  
Narrator is a screen reader that reads what is displayed on the screen aloud and describes events such as error messages.
- **On-Screen Keyboard**

If you prefer to type or enter data into your computer using a mouse, joystick, or other pointing device instead of a physical keyboard, you can use On-Screen Keyboard. On-Screen Keyboard displays a visual keyboard with all the standard keys. You can select keys using the mouse or another pointing device, or you can tap to select the keys if your computer supports multi-touch screen.

- **High Contrast**

High Contrast is a feature that heightens the color contrast of some text and images on your screen. As a result, those items are more distinct and easier to identify.

- **Personalized keyboard**

Adjust keyboard settings to make your keyboard easier to use. For example, you can use your keyboard to control the pointer and make the keyboard easier to type certain key combinations.

- **Personalized mouse**

Adjust mouse settings to make your mouse easier to use. For example, you can change the pointer appearance and make your mouse easier to manage windows.

#### Speech Recognition

Speech Recognition enables you to control your computer by voice.

Using only your voice, you can start programs, open menus, click objects on the screen, dictate text into documents, and write and send e-mails. Everything you do with the keyboard and mouse can be done with only your voice.

To use Speech Recognition, do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Ease of Access → Speech Recognition**.
3. Follow the instructions on the screen.

#### Screen-reader technologies

Screen-reader technologies are primarily focused on software program interfaces, help systems, and various online documents. For additional information about screen readers, see the following:

- Using PDFs with screen readers:  
<https://www.adobe.com/accessibility/html/psrprod-04070/>
- Using the JAWS screen reader:  
<https://www.freedomscientific.com/Products/Blindness/JAWS>
- Using the NVDA screen reader:  
<https://www.nvaccess.org/>

#### Screen resolution

You can make the text and images on your screen easier to read by adjusting the screen resolution of your computer.

To adjust the screen resolution, do the following:

1. Right-click an empty area of the desktop and then click **Display settings → Display**.
2. Follow the instructions on the screen.

**Note:** Setting a resolution too low might prevent some items from fitting on the screen.

### Customizable item size

You can make the items on your screen easier to read by changing the item size.

- To change the item size temporarily, use the Magnifier tool in Ease of Access Center.
- To change the item size permanently, do the following:
  - Change the size of all the items on your screen.
    1. Right-click an empty area of the desktop and then click **Display settings** → **Display**.
    2. Change the item size by following the instructions on the screen. For some applications, your configuration might not take effect until you sign out and then sign in again.
  - Change the size of the items on a Web page.  
Press and hold **Ctrl**, and then press the plus-sign key (+) to enlarge or the minus-sign key (-) to reduce the text size.
  - Change the size of the items on the desktop or a window.

**Note:** This function might not work on some windows.

If your mouse has a wheel, press and hold **Ctrl**, and then scroll the wheel to change the item size.

### Industry-standard connectors

Your computer provides industry-standard connectors that enable you to connect assistive devices.

### Documentation in accessible formats

Lenovo provides electronic documentation in accessible formats, such as properly tagged PDF files or HyperText Markup Language (HTML) files. Lenovo electronic documentation is developed to ensure that visually impaired users can read the documentation through a screen reader. Each image in the documentation also includes adequate alternative text so that visually impaired users can understand the image when they use a screen reader.

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## Ergonomic information

Good ergonomic practice is important to get the most from your personal computer and to avoid discomfort. Arrange your workplace and the equipment you use to suit your individual needs and the kind of work that you perform. In addition, use healthy work habits to maximize your performance and comfort when using your computer.

Working in the virtual office might mean adapting to frequent changes in your environment. Adapting to the surrounding light sources, active seating, and the placement of your computer hardware, can help you improve your performance and achieve greater comfort.

This example shows someone in a conventional setting. Even when not in such a setting, you can follow many of these tips. Develop good habits, and they will serve you well.



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**General posture:** Make minor modifications to your working posture to defer the onset of discomfort caused by long periods of working in the same position. Frequent short breaks from your work also help to prevent minor discomfort associated with your working posture.

**Display:** Position the display to maintain a comfortable viewing distance of 510 mm to 760 mm (20 inches to 30 inches). Avoid glare or reflections on the display from overhead lighting or outside sources of light. Keep the display screen clean and set the brightness to levels that enable you to see the screen clearly. Press the brightness control keys to adjust display brightness.

**Head position:** Keep your head and neck in a comfortable and neutral (vertical, or upright) position.

**Chair:** Use a chair that gives you good back support and seat height adjustment. Use chair adjustments to best suit your comfort posture.

**Arm and hand position:** If available, use chair arm rests or an area on your working surface to provide weight support for your arms. Keep your forearms, wrists, and hands in a relaxed and neutral (horizontal) position. Type with a soft touch without pounding the keys.

**Leg position:** Keep your thighs parallel to the floor and your feet flat on the floor or on a footrest.

### What if you are traveling?

It might not be possible to observe the best ergonomic practices when you are using your computer while on the move or in a casual setting. Regardless of the setting, try to observe as many of the tips as possible. Sitting properly and using adequate lighting, for example, helps you maintain desirable levels of comfort and performance. If your work area is not in an office setting, ensure to take special note of employing active sitting and taking work breaks. Many ThinkPad product solutions are available to help you modify and expand your computer to best suit your needs. You can find some of these options at <http://www.lenovo.com/ergonomics>. Explore your options for docking solutions and external products that provide the adjustability and features that you want.

### Questions about vision?

The visual display screens of ThinkPad notebook computers are designed to meet the highest standards. These visual display screens provide you with clear, crisp images and large, bright displays that are easy to see, yet easy on the eyes. Any concentrated and sustained visual activity can be tiring. If you have questions on eye fatigue or visual discomfort, consult a vision-care specialist for advice.

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## Cleaning and maintenance

With appropriate care and maintenance your computer will serve you reliably. The following topics offer information to help you keep your computer in top working order.

### Basic maintenance tips

Here are some basic points about keeping your computer functioning properly:

- Store packing materials safely out of the reach of children to prevent the risk of suffocation from plastic bags.
- Keep your computer away from magnets, activated cellular phones, electrical appliances, or speakers (more than 13 cm or 5 inches).
- Avoid subjecting your computer to extreme temperatures (below 5°C/41°F or above 35°C/95°F).
- Avoid placing any objects (including paper) between the display and the keyboard or the palm rest.
- Your computer display is designed to be opened and used at an angle slightly greater than 90 degrees. Do not open the display beyond 180 degrees. Otherwise, the computer hinge might get damaged.

- Do not turn your computer over when the ac power adapter is plugged in, otherwise, it could break the adapter plug.
- Before moving your computer, be sure to remove any media, turn off attached devices, and disconnect cords and cables.
- When picking up your open computer, hold it by the bottom. Do not pick up or hold your computer by the display.
- Only an authorized ThinkPad repair technician should disassemble and repair your computer.
- Do not modify or tape the latches to keep the display open or closed.
- Avoid directly exposing your computer and peripherals to the air from an appliance that can produce negative ions. Whenever possible, ground your computer to facilitate safe electrostatic discharge.

#### **Cleaning your computer**

It is a good practice to clean your computer periodically to protect the surfaces and ensure trouble-free operation.

**Cleaning the computer cover:** Wipe it with a lint-free cloth dampened in mild soap and water. Avoid applying liquids directly to the cover.

**Cleaning the keyboard:** Wipe the keys one by one with a lint-free cloth dampened in mild soap and water. If you wipe several keys at a time, the cloth might hook onto an adjacent key and possibly damage it. Avoid spraying cleaner directly onto the keyboard. To remove any crumbs or dust from beneath the keys, you can use a camera blower with a brush or use cool air from a hair dryer.

**Cleaning the computer screen:** Scratches, oil, dust, chemicals, and ultraviolet light can affect the performance of your computer screen. Use a dry, soft lint-free cloth to wipe the screen gently. If you see a scratchlike mark on your screen, it might be a stain. Wipe or dust the stain gently with a soft, dry cloth. If the stain remains, moisten a soft, lint-free cloth with water or eyeglass cleaner, but do not apply liquids directly to your computer screen. Ensure that the computer screen is dry before closing it.

## Chapter 5. Security

This chapter provides information about how to protect your computer from unauthorized use.

### Using passwords

This topic provides information about how to use the power-on password, supervisor password, and hard disk password.

#### Passwords introduction

You can help prevent your computer from unauthorized use by using passwords. After you set a password, a prompt is displayed on the screen each time you turn on the computer. Enter your password at the prompt. You cannot use the computer unless you type the correct password.

If you have set a power-on password, a supervisor password, or a hard disk password, it unlocks automatically when the computer resumes from sleep mode.

**Note:** If a Windows password has been set, you are prompted to enter it when the computer resumes from sleep mode.

#### Power-on password

You can set a power-on password to help protect your computer against unauthorized access.

If you set a power-on password, the password prompt is displayed on the screen whenever you turn on the computer. You must enter the correct password to start using the computer.



When this icon is displayed, type a power-on password or a supervisor password.

#### Supervisor password

The supervisor password protects the system information stored in the ThinkPad Setup program. It provides the following security features:

- If only a supervisor password is set, a password prompt is displayed when you try to start the ThinkPad Setup program. Unauthorized users cannot change most of the system configuration options in the ThinkPad Setup program without the password.
- The system administrator can use the supervisor password to access a computer even if the user of that computer has set a power-on password. The supervisor password overrides the power-on password.
- The system administrator can set the same supervisor password on many ThinkPad notebook computers to make administration easier.

#### Hard disk passwords

Setting a hard disk password prevents unauthorized access to the data on the hard disk drive. When a hard disk password is set, you are prompted to type a valid password each time you try to access the hard disk drive.

The following two types of hard disk passwords can help protect the information stored on the storage drive:

- **User hard disk password**

If a user hard disk password has been set, but no master hard disk password has been, the user must enter the user hard disk password to access files and applications on the storage drive.

- **Master hard disk password**


The master hard disk password also requires a user hard disk password. The master hard disk password is set and used by a system administrator. It enables the administrator to access any storage drive in a system like a master key. The administrator sets the master password, then assigns a user password for each computer in the network. The user can then change the user password as desired, but the administrator still can get access by using the master password.

When a master hard disk password is set, only the administrator can remove the user hard disk password.



When this icon is displayed, type a user hard disk password. To type a master hard disk password,



press F1. When the icon changes to this icon, type the master hard disk password. To return to the icon , press F1 again.

#### Tips on using the hard disk passwords:

- You can set the minimum length of a hard disk password.
- If you set a hard disk password of over seven characters, the storage drive can be used only with a computer that can recognize a hard disk password of over seven characters. If you then install the storage drive in a computer that cannot recognize a hard disk password that contains more than seven characters, you cannot access the drive.
- Record your password and store it in a safe place. If you forget the user hard disk password, or both user and master hard disk passwords, Lenovo cannot reset your passwords or recover data from the storage drive. You must take your computer to a Lenovo reseller or a marketing representative to have the storage drive replaced. Proof of purchase is required, and a fee will be charged for parts and service.

**Notes:** The eDrive storage drives or Trusted Computing Group (TCG) Opal-compliant storage drives provide self-encryption capabilities to secure your data.

- If a TCG Opal-compliant storage drive and a TCG Opal management software program are installed, and the TCG Opal management software program is activated, the hard disk password is not available.
- If an eDrive storage drive is installed in your computer, and your computer is preinstalled with the Windows 10 operating system, the hard disk password is not available.

### Setting, changing, or removing a password

Before you start, print these instructions.

To set, change, or remove a password, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Security** → **Password** by using the directional keys.
3. Depending on the password type, select **Power-on Password**, **Supervisor Password**, or **Hard disk x Password**.
4. Follow the instructions on the screen to set, change, or remove a password.

You might want to record your password and store it in a safe place. Otherwise, if you forget the password, you have to take your computer to a Lenovo reseller or a marketing representative to have the password canceled.

## Hard disk security

To protect the computer from unauthorized security attacks, refer to the following tips to enhance security:

- Set a power-on password as well as a hard disk password. For security, a longer password is recommended.
- The hard disk drive built into your computer can be protected by UEFI BIOS. To provide reliable security, use the security chip and a security program with the Trusted Platform Module (TPM) management feature. See "Setting the security chip" on page 53.
- If a Disk Encryption storage drive is installed in your computer, ensure to protect the contents of your computer from unauthorized access by use of drive encryption software, such as Microsoft Windows BitLocker® Drive Encryption.
- Before you dispose of, sell, or hand over your computer, delete the data stored on it. For more information, see "Deleting data from your storage drive" on page 55.

### Using Windows BitLocker Drive Encryption

To help protect your computer against unauthorized access, use the drive encryption software, such as Windows BitLocker Drive Encryption.

Windows BitLocker Drive Encryption (referred to as BitLocker) is an integral security feature of some editions of the Windows operating system. It can help you protect the operating system and data stored on your computer, even if your computer is lost or stolen. BitLocker can encrypt all user and system files, including the swap and hibernation files.

BitLocker uses the TPM to provide enhanced protection for your data and to ensure early boot component integrity. A compatible TPM is defined as a V2.0 TPM.

To check the BitLocker status, go to Control Panel, view Control Panel by Category, and click **System and Security** → **BitLocker Drive Encryption**.

For more information, see the help system of the Windows operating system, or search for "Microsoft Windows BitLocker Drive Encryption Step-by-Step Guide" on the Microsoft Web site.

### Disk Encryption hard disk drive and Encryption solid-state drive

Some models contain the Disk Encryption hard disk drive, Encryption solid-state drive, or Encryption hybrid drive. This encryption technology helps to protect your computer against security attacks on media, NAND flash, or device controllers by use of a hardware encryption chip. For the efficient use of the encryption feature, set a hard disk password for the internal storage drive.

## Setting the security chip

Strict security requirements are imposed on network client computers that transfer confidential information electronically. Depending on the options you ordered, your computer might have an embedded security chip (a cryptographic microprocessor). With the security chip, you can do the following:

- Protect your data and system
- Strengthen access controls
- Secure communications

Before you start, print these instructions.

To set an item on the **Security Chip** submenu, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Security** → **Security Chip** by using the directional keys.
3. Press Enter. The **Security Chip** submenu opens.
4. Move to an item you want to set by using the directional keys. When the item is highlighted, press Enter.
5. Set other items that you want to set.
6. Press F10. A Setup Confirmation window is displayed. Select **Yes** to save the configuration changes and exit.

### Notes:

- Ensure that the supervisor password has been set in ThinkPad Setup. Otherwise anyone can change the settings for the security chip.
- When you clear the security chip, turn off your computer and then turn it on again after you set the security chip to **Active**. Otherwise, the **Clear Security Chip** option is not displayed.

## Using the fingerprint reader

Depending on the model, your computer might have a fingerprint reader. Fingerprint authentication can replace your passwords, such as the Windows password, power-on password, and hard disk password. In this way, you can log in to your computer simply and securely.

### Enrolling your fingerprints

To enable fingerprint authentication, enroll your fingerprints first. During the enrollment, the fingerprints are associated with the Windows password automatically. It is recommended that you enroll more than one fingerprint in case of any injuries to your fingers.

To enroll your fingerprints, do the following:

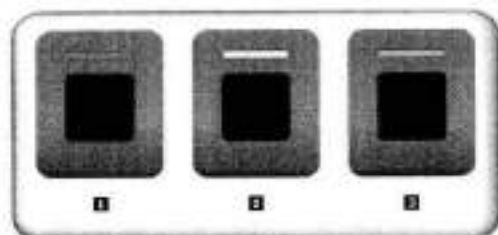
1. Open the Start menu and then click **Settings** → **Accounts** → **Sign-in options**.
2. Follow the instructions on the screen to finish the enrollment.

### Scanning your finger

To scan your finger, tap the fingerprint reader with the top joint of your finger and hold your finger there for one or two seconds with a little pressure. Then lift the finger to complete one scan.



#### Fingerprint reader indicator



**Off:** The fingerprint reader is not ready for tapping.

**White:** The fingerprint reader is ready for tapping.

**Amber, blinking:** The fingerprint cannot be authenticated.

#### Associating your fingerprints with your power-on password and hard disk password

To associate your fingerprints with your power-on password and hard disk password, manually create a connection by doing the following:

1. Turn off and then turn on the computer.
2. When prompted, scan your finger on the fingerprint reader.
3. Enter your power-on password, hard disk password, or both as required. The connection is created.

When you start the computer again, you can use your fingerprints to log in to the computer with no need to enter your Windows password, power-on password, and hard disk password.

**Attention:** If you always use your fingerprint to log in to the computer, you might forget your passwords. Write down your passwords, and keep them in a safe place. If you forget your power-on password, you must take your computer to a Lenovo-authorized service or a marketing representative to have the password canceled. If you forget your hard disk password, Lenovo cannot reset your password or recover data from the storage drive. You must take your computer to a Lenovo-authorized service or a marketing representative to have the storage drive replaced. Proof of purchase is required, and a fee will be charged for parts and service.

#### Maintaining the fingerprint reader

The following actions could damage the fingerprint reader or cause it not to work properly:

- Scratching the surface of the reader with a hard, pointed object
- Scraping the surface of the reader with your fingernail or anything hard
- Using or touching the reader with a dirty finger

If you notice any of the following conditions, gently clean the surface of the reader with a dry, soft, lint-free cloth:

- The surface of the reader is dirty or stained.
- The surface of the reader is wet.
- The reader often fails to enroll or authenticate your fingerprint.

If your finger has any of the following conditions, you might not be able to register or authenticate it:

- Your finger is wrinkled.
- Your finger is tough, dry, or injured.
- Your finger is stained with dirt, mud, or oil.
- The surface of your finger is different from the one when you enrolled your fingerprint.
- Your finger is wet.
- Your finger that you are currently using has not been enrolled before.

To improve the situation, try the following:

- Clean or wipe your hands to remove any excess dirt or moisture from the fingers.
- Enroll and use a different finger for authentication.

#### Deleting data from your storage drive

Some of the data stored on the storage drive might be sensitive. Handing your computer over to someone else without deleting the installed software, such as operating systems and programs, might mean violate the license agreements. Be sure to delete data stored on the storage drive before you dispose of, sell, or hand over your computer.

You can use the following methods to delete data from the storage drive:

- Move the data to the Recycle Bin, and then empty the Recycle Bin.
- Format your storage drive, using the software to initialize it.
- Use the recovery program provided by Lenovo to bring the storage drive back to the factory default settings.

These operations, however, only change the file location of the data; they do not delete the data itself. The data is still there, even though it seems to be lost. Thus, it is sometimes possible to read the data by use of special software for data recovery. There is a risk that people of bad faith might read and misuse the critical data on storage drives for unexpected purposes.

To prevent leakage of data, it is important that you delete all the data from the hard disk drive when you dispose of, sell, or hand over your computer. You can destroy the data physically by smashing the hard disk drive with a hammer, or magnetically by means of strong magnetic power, thus making the data unreadable. But it is recommended that you use the software (payware) or service (pay service) developed for that purpose. The process might take several hours.

For disposing of data on the solid-state drive, Lenovo provides the Drive Erase Utility for Resetting the Cryptographic Key and Erasing the Solid State Drive tool.

Some computers might support a Disk Encryption hard disk drive or Encryption solid-state drive and have such a drive installed. You can logically dispose of all the data on the drive in a short time by erasing the cryptographic key. The data encrypted with the old key is not physically erased but remains on the drive; however, it cannot be decrypted without the old key. This feature is also available with the Drive Erase Utility for Resetting the Cryptographic Key and Erasing the Solid State Drive tool.

#### Using firewalls

If your system is preinstalled with a firewall program, it protects against computer Internet security threats, unauthorized access, intrusions, and Internet attacks. It also protects your privacy.

For more information about how to use the firewall program, see the help system that comes with the program.

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### **Protecting data against viruses**

Lenovo provides a full version of antivirus software on your computer with a free 30-day subscription. After 30 days, you must renew the license to continue receiving the antivirus software updates.

For more information about your antivirus software, see the help system of your antivirus software.



## Chapter 6. Advanced configuration

This chapter provides information to help you further configure the computer.

### Installing the Windows 10 operating system

In some situations, you might need to install a new operating system. This topic provides instructions on how to install a Windows 10 operating system.

Before you start, print these instructions.

**Attention:** The process of installing a new operating system deletes all the data on your internal storage drive, including the data that were stored in a hidden folder.

To install the Windows 10 operating system, do the following:

1. Ensure that you set the security chip to TPM 2.0. For more information, see "Setting the security chip" on page 53.
2. For computer models that support the Intel Optane™ technology, start the ThinkPad Setup program and select **Config** → **Storage** → **Controller Mode**. Ensure that **RST mode** is selected.
3. Connect the drive that contains the operating system installation program to the computer.
4. Start the ThinkPad Setup program. See "Using the ThinkPad Setup program" on page 51.
5. Select **Startup** → **Boot** to display the **Boot Priority Order** submenu.
6. Select the drive that contains the operating system installation program, for example, **USB HDD**. Then press **Esc**.
7. Select **Restart** and ensure that **OS Optimized Defaults** is enabled. Then press **F10** to save the settings and exit the ThinkPad Setup program.
8. Follow the on-screen instructions to install the device drivers and necessary programs. See "Installing device drivers" on page 50.
9. After installing the device drivers, apply Windows Update to get the latest updates, for example the security patches.
10. Depending on your preference, install Lenovo programs. For information about Lenovo programs, see "Lenovo programs" on page 13.

**Note:** After installing the operating system, do not change the initial **UEFI/Legacy Boot** setting in the ThinkPad Setup program. Otherwise, the operating system will not start correctly.

For computer models that support the Intel Optane technology, continue to enable the Intel Optane memory by doing the following:

1. Go to <http://www.lenovo.com/support>. Download and install the Intel Rapid Storage Technology (IRST) Console with Device Driver on your computer.
2. Run the iRST Console with Device Driver.
3. Click **Intel® Optane™ Memory** and then follow the instructions on the screen to enable it.

When you install the Windows 10 operating system, you might need one of the following country or region codes:

Country or region	Code	Country or region	Code
China	SC	Netherlands	NL
Denmark	DK	Norway	NO
Finland	FI	Spain	SP
France	FR	Sweden	SV
Germany	GR	Taiwan and Hong Kong	TC
Italy	IT	United States	US
Japan	JP		

### Installing device drivers

Device drivers are programs that contain instructions for the operating system about how to operate or "drive" a certain piece of hardware. Each hardware component on your computer has its own specific driver. If you add a component, the operating system must be instructed on how to operate that piece of hardware. After you install the driver, the operating system can recognize the hardware component and understand how to use it.

**Note:** Because drivers are programs, like any other file on your computer, they are susceptible to corruption and might not perform properly if corruption occurs.

It is not always necessary to download the latest drivers. However, you should download the latest driver for a component when you notice poor performance from that component or when you added a component. This action might eliminate the driver as the potential cause of a problem.

#### Getting the latest drivers from the Web site

You can download and install updated device drivers from the Lenovo Support Web site by doing the following:

1. Go to <http://www.lenovo.com/support>.
2. Select the entry for your computer and then follow the instructions on the screen to download and install necessary software.

#### Getting the latest drivers using Lenovo Companion

The system update function of Lenovo Companion helps you keep the software on your computer up-to-date. Update packages are stored on Lenovo servers and can be downloaded from the Lenovo Support Web site. Update packages can contain applications, device drivers, UEFI BIOS flashes, or software updates. When Lenovo Companion connects to the Lenovo Support Web site, the program automatically recognizes the following information and determines what updates are available for your computer:

- Machine type and model of your computer
- Installed operating system
- Language of the operating system

Lenovo Companion then displays a list of update packages and categorizes each update as critical, recommended, or optional to help you understand the importance. You have complete control of which updates to download and install. After you select the update packages you want, Lenovo Companion automatically downloads and installs the updates.

Lenovo Companion is preinstalled on your computer and is ready to run. The only prerequisite is an active Internet connection. You can start the program manually, or you can use the schedule feature to enable the

program to search for updates automatically at specified intervals. You also can predefine scheduled updates to search by the critical severity level so the list you choose from contains only those update types that you need.

For more information about how to use Lenovo Companion, see the help system of the program.

## Using the ThinkPad Setup program

The ThinkPad Setup program enables you to select the preferred settings for your computer through configuring the BIOS.

### Configuring ThinkPad Setup

The ThinkPad Setup program menu lists various items about system configuration.

**Attention:** The default configurations are already optimized for you. Improper change of the configurations might cause unexpected results.

To configure ThinkPad Setup, do the following:

1. Restart the computer. When the logo screen is displayed, press F1. The ThinkPad Setup program starts.

**Note:** If you are required to enter the supervisor password, enter the correct password. You also can press Enter to skip the password prompt and start the ThinkPad Setup program. If you do not enter the password, you cannot change the configurations that are protected by the supervisor password.

2. Use the arrow keys to select a tab, or use the arrow keys to locate an item and press Enter to select it. Then the supported submenu is displayed.
3. Default values are in **boldface**. Set the value of an item by doing one of the following:
  - Press F6 to change to a higher value.
  - Press F5 to change to a lower value.
4. Press the Esc key to exit the submenu and return to the parent menu. Then use the same method mentioned above to change other configurations.
5. When you complete the configuration, press F10 to save and exit. You also can select the **Restart** tab in the ThinkPad Setup menu, and restart your computer with one of the provided options.

You can press F9 to restore to the default settings.

### Changing the startup sequence

In some cases, you might have to change the startup sequence so that the computer starts from a desired device when powered on. Read this topic to learn how to change the computer startup sequence.

#### Attention:

- After you change the startup sequence, ensure that you select the correct device during a copy, a save, or a format operation. If you select the wrong device, the data on that device might be erased or overwritten.
- If you are using the Windows BitLocker Drive Encryption feature and your computer has a Trusted Platform Module, do not change the startup sequence. BitLocker Drive Encryption locks the computer when it detects the change of startup sequence.

To change the startup sequence, do the following:

1. Access the ThinkPad Setup program and select **Startup → Boot**. Then press Enter. The default device order list is displayed.

2. Set the startup sequence as you desired.
3. Press F10 to save the changes and restart the system.

You also can change the startup sequence temporarily by doing the following:

1. Turn off the computer.
2. Turn on the computer. When the logo screen is displayed, press the F12 key.
3. Select the device that you want the computer to start from. Then press Enter.

**Note:** The **Boot** menu will be displayed if the computer cannot start from any devices or the operating system cannot be found.

### Updating the UEFI BIOS

The UEFI BIOS is the first program that the computer runs when the computer is turned on. The UEFI BIOS initializes the hardware components, and loads the operating system and other programs.

When you install a new program, device driver, or hardware component, you might be informed to update the UEFI BIOS. You can update the UEFI BIOS by starting your computer from a flash update disc or a flash update program running in the Windows environment.

The requirements for flash update are as follows:

- The computer must be started over LAN.
- The computer must be engaged in the Preboot eXecution Environment (PXE).
- A network management program must be installed on the computer of the network administrator.

For instructions on how to update the UEFI BIOS, go to <http://www.lenovo.com/support>.

### BIOS menu

This topic introduces the following BIOS menu of your computer:

- Main menu
- Config menu
- Date/Time menu
- Security menu
- Startup menu
- Restart menu

**Note:** Depending on the model and operating system, the menu items and the default value might change without notice.

#### Main menu

When you enter the ThinkPad Setup program, you first see the **Main** menu as follows:

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- UEFI BIOS Version
- UEFI BIOS Date
- Embedded Controller Version
- ME Firmware Version

- Machine Type Model
- System-unit serial number
- System board serial number
- Asset Tag
- CPU Type
- CPU Speed
- Installed Memory
- UUID
- MAC Address (Internal LAN)
- Preinstalled operating system license
- UEFI Secure Boot
- OA3 ID
- OA2

#### Config menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

#### Network

##### • Wake On LAN

Values: Disabled, AC only, AC and Battery

Description: The network administrator can turn on a computer from a management console by using the Wake on LAN feature. If you select **AC Only**, the Wake on LAN feature is enabled only when the ac power adapter is attached. If you select **AC and Battery**, the Wake on LAN feature is enabled with any power sources.

#### Notes:

- The magic packet type Wake on LAN requires that the ac power is attached.
- The Wake on LAN feature does not work when the hard disk password is set.

##### • Wake On LAN from Dock

Values: Disabled, Enabled

Description: Enable or disable the Wake On LAN from Dock feature when the ThinkPad USB-C Dock or ThinkPad Thunderbolt 3 Dock is attached.

**Note:** The Wake on LAN from Dock feature does not work when the hard disk password is set.

##### • Ethernet LAN Option ROM

Values: Disabled, Enabled

Description: The Ethernet LAN Option ROM enables the startup from an integrated network device. This menu is displayed only in **Legacy Only** boot mode or **Both** boot mode with **Legacy first**.

##### • UEFI IPv4 Network Stack

Values: Disabled, Enabled

Description: Enable or disable Internet Protocol Version 4 (IPv4) network stack for UEFI environment. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**.

##### • UEFI IPv6 Network Stack

Values: Disabled, Enabled

Description: Enable or disable Internet Protocol Version 6 (IPv6) network stack for UEFI environment. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**.

##### • UEFI PXE Boot Priority

Values: IPv6 First, IPv4 First

Description: Select network stack priority for UEFI PXE boot. This menu is displayed only in **UEFI Only** boot mode or **Both** boot mode with **UEFI first**, when IPv6 and IPv4 stacks are both enabled.

##### • Wireless Auto Disconnection

Values: Disabled, Enabled

Description: Enable or disable the **Wireless Auto Disconnection** feature when the Ethernet cable is connected to the Ethernet LAN on system. If it is enabled, Wireless LAN signals are automatically turned off whenever Ethernet cable is connected.

**Note:** Ethernet attached by USB is not supported by this feature.

##### • MAC address Pass Through

Values: Disabled, Enabled

Description: Enable or disable the **MAC address Pass Through** function when a dock is attached. If you select **Enabled**, the MAC address for the dock will be changed to the Internal MAC address. If you select **Disabled**, the dock Ethernet uses its own MAC address.

#### USB

##### • USB UEFI BIOS Support

Values: Disabled, Enabled

Description: Enable or disable the boot support for USB storage devices.

##### • Always On USB

Values: Disabled, Enabled

Description: Select **Enabled** to charge devices through the Always On USB connectors even when the computer is turned off, in sleep mode, or in hibernation mode.

##### • Charge in Battery Mode

Values: Disabled, Enabled

Description: It is supported only when **Always On USB** is **Enabled**. Select **Enabled** to charge devices through the Always On USB connectors even when the system is in hibernation mode, or is power-off and in battery operation.

#### Keyboard/Mouse

##### • TrackPoint

Values: Disabled, Enabled

Description: Enable or disable the built-in TrackPoint pointing device.

##### • Trackpad

Values: Disabled, Enabled

Description: Enable or disable the built-in trackpad.

**Note:** If you want to use an external mouse, select **Disabled**.

##### • Fn and Ctrl Key swap

Values: Disabled, Enabled

Description: If you select **Enabled**, the Fn key works as the Ctrl key and the Ctrl key works as the Fn key.

**Note:** Only the Fn key can wake up the system from sleep mode.

- **Fn Sticky key**

Values: **Disabled**, **Enabled**

Description: If you select **Enabled**, you can press the Fn key (instead of press and hold) to keep it in a pressed condition. Then press the function key you want. The action is equivalent to pressing the function key simultaneously with the Fn key. When you press the Fn key twice, the Fn key will be locked in the press-and-hold mode until you press the Fn key again.

- **F1-F12 as Primary Function**

Values: **Disabled**, **Enabled**

Description: If you select **Enabled**, pressing the function keys directly inputs F1-F12. If you select **Disabled**, pressing the function keys directly initiates the special function printed as an icon on each key. To temporarily switch the above two functions, press Fn-Esc. The FnLock indicator is on when FnLock is enabled.

## Display

- **Boot Display Device**

Values: **ThinkPad LCD**, **External Display**

Description: Select the display device that you want to activate at boot time. This selection is effective for boot time, password prompt, and ThinkPad Setup. You can attach an external display to the USB-C connector or HDMI connector on your computer. If multiple displays are attached, the first recognized one will be activated at boot time.

- **Shared Display Priority**

Values: **HDMI**, **USB Type-C**

Description: Select the priority between shared display outputs. The HDMI connector and the rear USB Type-C connector share a single display output and the two connectors cannot be used simultaneously for the external display. This option chooses which connector is prioritized for the external display.

- **Total Graphics Memory**

Values: **256 MB**, **512 MB**

Description: Allocate the total memory which Intel internal graphics shares.

**Note:** If you select **512 MB**, the maximum usable memory might be reduced on the 32-bit operating system.

- **Boot Time Extension**

Values: **Disabled**, **1 second**, **2 seconds**, **3 seconds**, **5 seconds**, **10 seconds**

Description: This option defines the amount of time to extend the boot process, in seconds. The system cannot detect some external monitors during boot because they need a few seconds to be ready. Try this option if the monitor being used does not display the boot screens.

## Power

- **Intel SpeedStep® technology**

Values: **Disabled**, **Enabled**

Description: Select the mode of Intel SpeedStep technology at runtime. If you select **Disabled**, the highest speed, and runtime is not supported.

- **Mode for AC**

Values: **Maximum Performance**, **Battery Optimized**

Description: **Maximum Performance:** Always highest speed

- **Mode for Battery**

Values: **Maximum Performance**, **Battery Optimized**

Description: **Battery Optimized:** Always lowest speed

- **Adaptive Thermal Management**

Description: Select a thermal management scheme to use. The scheme affects fan speed, temperature, and performance.

- **Scheme for AC**

Values: **Maximum Performance**, **Balanced**

Description: **Maximum Performance:** Reduce CPU throttling. **Balanced:** Balanced sound, temperature and performance.

- **Scheme for Battery**

Values: **Maximum Performance**, **Balanced**

Description: **Balanced:** Balanced sound, temperature and performance. **Maximum Performance:** Reduce CPU throttling.

- **CPU Power Management**

Values: **Disabled**, **Enabled**

Description: Enable or disable the power-saving feature that stops the microprocessor clock automatically when there are no system activities. Normally, it is not necessary to change the setting.

- **Power On with AC Attach**

Values: **Disabled**, **Enabled**

Description: Enable or disable a feature that turns on the computer when the ac power adapter is attached. If you select **Enabled**, the system is powered on when the ac power adapter is attached. If the system is in hibernation state, the system resumes normal operation. If you select **Disabled**, the system is not powered on nor resumed when the ac power adapter is attached.

- **8254 Timer Clock Gating**

Values: **Auto**, **Disabled**

Description: Select 8254 Timer Clock Gating setting. If you select **Auto**, 8254 Timer clock stops only when the startup setting is set as **UEFI Only** and **CSM Support** is set as **No**. If you select **Disabled**, 8254 Timer clock is running always.

- **Disable Built-in Battery**

Values: **Yes**, **No**

Description: Temporary disable battery for servicing the system. After selecting this item, the system will be automatically powered off, then ready to be serviced. **Note:** the battery will be automatically enabled when the AC adapter is reconnected.

## Beep and Alarm

- **Password Beep**

Values: **Disabled**, **Enabled**

Description: Enable or disable a beep when the computer is waiting for a power-on, hard disk, or supervisor password. Different beeps remind you that the password you entered is right or wrong.

- **Keyboard Beep**

Values: **Enabled**, **Disabled**

Description: Enable or disable a beep when unmanageable key combinations are pressed.

## Storage

**Note:** This menu is displayed when Intel Optane memory is installed.

### • Controller Mode

Values: AHCI mode, **RST mode**

Description: If your computer has an Intel Optane memory installed, select **RST mode** so that you can enable the Intel Optane memory in the Windows operating system.

**Note:** If a hard disk password has been set, you cannot change this setting until you delete the hard disk password.

### • Intel (R) Rapid Storage Technology

Description: Enter Intel (R) Rapid Storage Technology Configuration Utility to manage volumes on Intel (R) RAID Controller.

## Thunderbolt(TM) 3

### • Thunderbolt BIOS Assist Mode

Values: Enabled, **Disabled**

Description: Enable or disable Thunderbolt BIOS Assist mode. If you select **Enabled**, Thunderbolt ports are controlled by BIOS instead of operating system, power consumption is increased, and wake from Modern Standby mode is disabled. You can only set to **Enabled** on the Linux and the Windows 10 (earlier than version 1709) operating systems.

### • Wake by Thunderbolt(TM) 3

Values: Disabled, **Enabled**

Description: Enable or disable Wake Feature with Thunderbolt(TM) 3 Port. If you select **Enabled**, the battery life during low power state may become shorter.

### • Security level

Values: No Security, **User Authorization**, Secure Connect, Display Port and USB

Description: Select the security level.

- No Security: Allow Thunderbolt devices to be connected automatically.
- User Authorization: Allow Thunderbolt devices to be connected after user authorization.
- Secure Connect: Allow Thunderbolt devices to be connected with a saved key that has been approved by the user.
- Display Port and USB: Allow only DisplayPort-compatible devices and USB devices to be connected. Thunderbolt devices are not allowed to be connected.

### • Support in Pre-Boot Environment

Enable or disable the pre-OS support for devices connected to the Thunderbolt 3 port.

#### - Thunderbolt(TM) device

Values: **Disabled**, Enabled

Description: Enable or disable pre-OS support for Thunderbolt(TM) devices attached to Thunderbolt (TM) 3 port. To use a device in pre-boot environment, authorize it in the OS or set security level to No Security. To boot from a device, configure it in the **Startup → Boot** menu.

#### - USB device

Values: **Disabled**, Enabled

Description: Enable or disable pre-OS support for USB devices attached to Thunderbolt (TM) 3 port. To use a device in pre-boot environment, authorize it in the OS or set security level to No Security. To boot from a device, configure it in the **Startup → Boot** menu.

## Intel AMT

### • Intel (R) AMT Control

Values: Disabled, **Enabled**, Permanently Disabled

Description: This option enables or disables Intel (R) Active Management Technology (AMT) function. If you select **Permanently Disabled**, you can never enable it again. Be cautious when you make the selection.

### • USB Key Provisioning

Values: **Disabled**, Enabled, Permanently Disabled

Description: This option enables or disables USB key provisioning.

### • CIRA Timeout

Values: 0-255

Description: Set the timeout option for the CIRA connection to be established. Selectable values are from 0 to 255. If you select 0, use 60 seconds as the default timeout value. If you select **255**, the waiting time for establishing a connection is unlimited.

**Note:** The default value is 60 seconds.

### • Console Type

Values: PC-ANSI, VT100, **VT100+**, VT-UTF8

Description: Select the console type for AMT. This console type must match the Intel AMT remote console.

## Date/Time menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

### • System Date

Descriptions: Set or change the date of the system.

### • System Time

Descriptions: Set or change the time of the system.

## Security menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

## Password

### • Supervisor Password

Values: **Disabled**, Enabled

Descriptions: Set a supervisor password to prevent unauthorized users from changing the startup sequence, network-related settings, and system date and time. For more information, see "Passwords introduction" on page 51.

### • Lock UEFI BIOS Settings

Values: **Disabled**, Enabled

Descriptions: Enable this option to prevent unauthorized users from changing any settings in ThinkPad Setup. To use this function, a supervisor password is required.

### • Password at Unattended Boot

Values: Disabled, **Enabled**

Descriptions: When this option is enabled, a password prompt is displayed when the computer is turned on or resumed from hibernation mode by an unattended event such as a Wake on LAN attempt. To prevent unauthorized access, set the user authentication on the operating system.

- **Password at Restart**

Values: **Disabled**, **Enabled**

Descriptions: When this option is enabled, a password prompt is displayed when you restart the computer. To prevent unauthorized access, set the user authentication on the operating system.

- **Password at Boot Device List**

Values: **Disabled**, **Enabled**

Descriptions: If you enable this option, the supervisor password is required when you try to enter the Boot menu by repeatedly pressing F12. To use this function, a supervisor password must be set.

- **Password Count Exceeded Error**

Values: **Disabled**, **Enabled**

Descriptions: Enable this option to display the POST 0199 error message and prompt for the Security password.

- **Set Minimum Length**

Values: **Disabled**, x characters (4 < x < 12)

Descriptions: Specify a minimum length for power-on passwords and hard disk passwords. If a supervisor password is set, you cannot change the minimum length until you log in as a supervisor.

- **Power-On Password**

Values: **Disabled**, **Enabled**

Descriptions: Set a power-on password to protect the computer from unauthorized access. For more information, see "Passwords introduction" on page 51.

- **Hard Disk x Password**

Values: **Disabled**, **Enabled**

Descriptions: Set a hard disk password to prevent unauthorized users from accessing data on the internal storage drive. For more information, see "Passwords introduction" on page 51.

## Fingerprint

- **Predesktop Authentication**

Values: **Disabled**, **Enabled**

Descriptions: Enable or disable fingerprint authentication before the operating system is loaded.

- **Reader Priority**

Values: **External** → **Internal**, **Internal Only**

Descriptions: If your computer has an internal fingerprint reader and an attached external fingerprint reader, use this option to specify the fingerprint reader priority.

- **Security Mode**

Values: **Normal**, **High**

Descriptions: If the fingerprint is not authenticated, you can enter a password instead. If you have selected **Normal**, enter either the power-on password or the supervisor password; if you have selected **High**, supervisor password must be entered.

- **Password Authentication**

Values: **Disabled**, **Enabled**

Descriptions: Enable this option to use password authentication when fingerprints are not available. This item is displayed if **Security Mode** is set to **High**.

- **Reset Fingerprint Data**

Value: **Enter**

Descriptions: Use this option to erase all fingerprint data stored in the fingerprint reader and reset the settings to the factory default state. As a result, any power-on security features previously enabled will not work until they are re-enabled in the fingerprint software.

## Security Chip

- **Security Chip Type**

Values: **TPM 2.0**

Descriptions: You can use a discrete TPM chip with TPM 2.0 mode.

- **Security Chip**

Values: **Enabled**, **Disabled**

Descriptions: Enable or disable the security chip.

- **Security Reporting Options**

- **SMBIOS Reporting**

Values: **Enabled**, **Disabled**

Descriptions: When enabled, changes to corresponding UEFI BIOS data are logged in a location, PCR1, defined in the TCG standards), which other authorized programs can monitor, read and analyze.

- **Clear Security Chip**

Descriptions: Use this option to clear the encryption key. It will not be possible to access already-encrypted data after these keys are cleared.

- **Intel (R) TXT Feature**

Values: **Disabled**, **Enabled**

Descriptions: Enable or disable the Intel Trusted Execution Technology.

- **Physical Presence for Clear**

Values: **Disabled**, **Enabled**

Descriptions: If this option is enabled, a confirmation message is displayed when you clear the security chip.

## UEFI BIOS Update Option

- **Flash BIOS Updating by End-Users**

Values: **Disabled**, **Enabled**

Descriptions: When this option is enabled, all users can update the UEFI BIOS. If you disable this option, the supervisor password will be required to update the UEFI BIOS.

- **Secure Rollback Prevention**

Values: **Disabled**, **Enabled**

Descriptions: When this option is disabled, you can flash the UEFI BIOS to earlier version.

- **Windows UEFI Firmware Update**

Values: **Disabled**, **Enabled**

Descriptions: This option enables or disables **Windows UEFI Firmware Update** feature. When this option is enabled, Windows UEFI firmware update is allowed.

## Memory Protection

### • Execution Prevention

Values: **Disabled**, **Enabled**

Descriptions: Some computer viruses and worms cause memory buffers to overflow. By enabling this option, you can protect your computer against attacks from such viruses and worms. If the option is enabled but you find that a program does not run properly, disable this option first and then reset the settings.

## Virtualization

### • Intel Virtualization Technology

Values: **Disabled**, **Enabled**

Descriptions: If this option is enabled, a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology.

### • Intel VT-d Feature

Values: **Disabled**, **Enabled**

Descriptions: Intel VT-d stands for Intel Virtualization Technology for Directed IO. When enabled, a VMM can utilize the platform infrastructure for IO virtualization.

## I/O Port Access

Descriptions: Use this submenu to enable or disable the following hardware features:

- Ethernet LAN
- Wireless LAN
- Wireless WAN
- Bluetooth
- USB port
- Memory card slot
- Smart card slot
- Integrated camera
- Microphone
- Fingerprint reader
- Thunderbolt(TM) 3
- NFC device

## Internal Device Access

### • Bottom Cover Tamper Detection

Values: **Disabled**, **Enabled**

Descriptions: When this option is enabled, supervisor password is required when a bottom cover tamper is detected. This option is not functional until a supervisor password is set.

### • Internal Storage Tamper Detection

Values: **Disabled**, **Enabled**

Descriptions: When this option is enabled, removing any internal storage device when your computer is in sleep mode will be detected. If you remove the internal storage device while the computer is in sleep mode, the computer will shut down when you wake it up, and any unsaved data will be lost.

## Anti-Theft

### • Computrace Module Activation

Values: **Disabled**, **Enabled**, **Permanently Disabled**

Descriptions: Enable the UEFI BIOS interface to activate the Computrace module. Computrace is an optional monitoring service from Absolute Software. If you select **Permanently Disabled**, you cannot enable this setting again.

## Secure Boot

### • Secure Boot

Values: **Disabled**, **Enabled**

Descriptions: Enable this option to prevent unauthorized operating systems from loading when you turn on the computer.

**Note:** Enabling **Secure Boot** requires to set the startup setting to **UEFI Only** and **CSM Support** to **No**.

### • Platform Mode

Values: **Setup Mode**, **User Mode**

Descriptions: Specify the system operating mode.

### • Secure Boot Mode

Values: **Standard Mode**, **Custom Mode**

Descriptions: Specify the **Secure Boot** mode.

### • Reset to Setup Mode

Descriptions: Use this option to clear the current platform key and reset **Platform Mode** to **Setup Mode**.

### • Restore Factory Keys

Descriptions: Use this option to restore all keys and certificates in **Secure Boot** databases to the factory defaults.

### • Clear All Secure Boot Keys

Descriptions: Use this option to clear all keys and certificates in **Secure Boot** databases and install your own keys and certificates.

## Intel(R) SGX

### • Intel(R) SGX Control

Values: **Disabled**, **Enabled**, **Software Controlled**

Descriptions: Enable or disable the Intel Software Guard Extensions (SGX) function. If you select **Software Controlled**, SGX will be controlled by the SGX application for UEFI boot OS.

### • Change Owner EPOCH

Value: **Enter**

Descriptions: Change Owner EPOCH to a random value. Use this option to clear SGX user data.

## Device Guard

### • Device Guard

Values: **Disabled**, **Enabled**

Descriptions: This option is used to support Microsoft Device Guard.

When this option is enabled, Intel Virtualization Technology, Intel VT-d Feature, Secure Boot, and OS Optimized Defaults are automatically enabled. Boot order is restricted to customer image only. To complete the configuration of Device Guard, you have to set a supervisor password.

When this option is disabled, the setup options are configurable and you can choose any boot options to start the computer.

#### Startup menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **Boot**

Descriptions: Define the startup sequence.

- **Network Boot**

Descriptions: Select the boot device when the system wakes from LAN. If Wake On LAN is enabled, the network administrator can turn on all of the computers in a LAN remotely through network management software.

- **UEFI/Legacy Boot**

Values: **Both**, UEFI Only, Legacy Only

Descriptions: Define the system boot capability.

- **UEFI/Legacy Boot Priority**

Values: Legacy First, **UEFI First**

Description: Select the boot priority between UEFI and Legacy.

- **CSM Support** (for UEFI only)

Values: Yes, **No**

Description: Compatibility Support Module (CSM) is required for starting the legacy operating system. If you select **UEFI only**, **CSM Support** is selectable. For **Both** or **Legacy Only** mode, **CSM Support** is not selectable.

- **Boot Mode**

Values: **Quick**, Diagnostics

Descriptions: Define which screen is displayed during the POST, the logo screen or the text message screen.

- **Option Key Display**

Values: Disabled, **Enabled**

Descriptions: If you disable this option, the "To interrupt normal startup, press Enter." message will not be displayed during the POST.

- **Boot Device List F12 Option**

Values: Disabled, **Enabled**

Descriptions: If you enable this option, you can open the Boot Menu window by continuously pressing F12 when the computer is powered on.

- **Boot Order Lock**

Values: Disabled, **Enabled**

Descriptions: Enable this option to lock the boot device priority order.

#### Restart menu

**Note:** The BIOS menu items might change without notice. Depending on the model, the default value might vary.

- **Exit Saving Changes**

Descriptions: Save the changes and restart the computer.

- **Exit Discarding Changes**

Descriptions: Discard the changes and restart the computer.

- **Load Setup Defaults**

Descriptions: Restore to the factory default settings.

**Note:** Enable OS Optimized Defaults to meet the Windows 10 certification requirements. When you change this setting, some other settings are changed automatically, such as **CSM Support**, **UEFI/Legacy Boot**, **Secure Boot**, and **Secure Rollback Prevention**.

- **Discard Changes**

Descriptions: Discard the changes.

- **Save Changes**

Descriptions: Save the changes.

## Using system management

This topic is primarily intended for the network administrators.

Your computer is designed for manageability, so that you can redirect more resources to better meet your business objectives.

This manageability, known as total cost of ownership (TCO), enables you to remotely operate client computers in the same way as you operate your own computer, such as turning on a client computer, formatting a storage drive, and installing a program.

Once the computer is configured and operational, you can manage it by using the software and the manageability features that are already integrated into the client computer and the network.

#### Desktop Management Interface

The UEFI BIOS of your computer supports an interface called System Management BIOS (SMBIOS) Reference Specification, version 2.8 or later. SMBIOS provides information about the hardware components of your computer. It is the responsibility of the UEFI BIOS to provide information about itself and the devices on the system board. This specification documents the standards for getting access to this BIOS information.

#### Preboot eXecution Environment

The Preboot eXecution Environment (PXE) technology makes the computer more manageable by enabling the computer to start from a server. Your computer supports the personal computer functions that PXE requires. For example, with the appropriate LAN card, your computer can be started from the PXE server.

**Note:** The Remote Initial Program Load (RIP) or RPL function cannot be used with your computer.

#### Wake on LAN

The network administrator can turn on a computer from a management console by using the Wake on LAN feature.

When the Wake on LAN feature is enabled, many operations, such as data transfer, software updates, and flash updates of the UEFI BIOS, can be done remotely without remote attendances. The updating process can perform after normal working hours and on weekends, so that the users are not interrupted during work, and the LAN traffic is kept to a minimum. It saves time and increases productivity.

If the computer is turned on through Wake on LAN, the computer starts follow the **Network Boot** sequence.



#### Asset ID EEPROM

The Asset ID EEPROM contains information about the computer configuration and the serial numbers of the key components. It also includes a number of blank fields where you can record information about the end users in your network.

To enable a network administrator to remotely control your computer, set the following system-management features in the ThinkPad Setup program:

- Wake on LAN
- Network Boot sequence

**Note:** If a supervisor password has been set, you are required to enter the supervisor password when you start the ThinkPad Setup program.

#### Enabling or disabling the Wake on LAN feature

When the Wake on LAN feature is enabled and the computer is connected to a LAN, the network administrator can start the computer remotely from a management console, using a remote network-management program.

To enable or disable the Wake on LAN feature, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Config** → **Network**. The **Network** submenu is displayed.
3. Select a corresponding option for the Wake on LAN feature.
4. Press F10 to save the settings and exit.

#### Defining a Network Boot sequence

When the computer wakes on LAN, the computer boots from the device as specified on the **Network Boot** menu, and then follow the boot order list on the **Boot** menu.

To define a Network Boot sequence, do the following:

1. Restart the computer. When the logo screen is displayed, press F1 to start the ThinkPad Setup program.
2. Select **Startup** → **Network Boot**. The boot device list is displayed.
3. Select a boot device to make it as the top boot priority.
4. Press F10 to save the settings and exit.

You can press F9 to restore to the factory default settings.

## Chapter 7. Troubleshooting computer problems

This chapter provides information about what to do if you experience a problem with your computer.

### General tips for preventing problems

This topic provides the following tips to help you prevent computing problems:

- Empty your recycle bin on a regular basis.
- Use a disk defragment tool regularly on your storage drive to improve data seek and read times.
- To free up disk space, uninstall unused programs. You also might want to look for program duplication or overlapping versions.
- Clean out your Inbox, Sent, and Trash folders from your e-mail client program.
- Back up your data at least once a week, if critical data is present. It is a good idea to back up the data daily. Lenovo has many backup options available for your computer.
- Schedule system restore operations to take a system snapshot periodically. For information about system restore, see Chapter 8 "Recovery information" on page 95.
- Go to <http://www.lenovo.com/support> to download and install updates for the device drivers and UEFI BIOS when needed.
- Keep up to date for device drivers on other non-Lenovo hardware. Before updating device drivers, read the device driver information release notes for compatibility or known issues.
- Keep a log book. Entries might include major hardware or software changes, driver updates, minor issues you have experienced, and how you resolved the minor issues.
- If you ever need to run a recovery on your computer to return the preinstalled contents onto the machine, the following tips might help along the way:
  1. Remove all external devices such as the printer and keyboard.
  2. Ensure that your battery is charged and your computer has the ac power connected.
  3. Access ThinkPad Setup and load the default settings.
  4. Restart the computer and start the recovery operation.
  5. If your computer uses discs as the recovery media, do not remove the disc from the drive until prompted to do so.

### Diagnosing problems with Lenovo Companion

Many computer problems can be solved without outside assistance. If you experience a problem with your computer, the first place to start is the troubleshooting information in your computer documentation. If you suspect a software problem, see the documentation, including readme files and help information systems, that come with the operating system or program.

ThinkPad notebook computers come with a set of diagnostic programs that you can use to help you identify hardware problems. Lenovo Companion is preinstalled on your computer and also is available for download at:

<https://ibm.lenovo.com/us/en/accessories/software/apps/lenovo-apps/companion/>

**Note:** If you are unable to isolate and repair the problem yourself after running Lenovo Companion, save and print the log files created by the program. You need the log files when you speak to a Lenovo technical support representative.

Lenovo Companion supports the hardware scan function. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for optimal system performance. To run Lenovo Companion, see "Accessing Lenovo programs" on page 13.

The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. You can get the latest technical information and download device drivers and updates from the Lenovo Support Web site at:

<http://www.lenovo.com/support>

For additional information, see the help system of the program.

### Troubleshooting

If your computer has an error, it typically displays a message or an error code, or makes a beep when you turn it on. When you experience a problem, see the corresponding symptom and solution in this topic to try to solve the problem by yourself.

### Computer stops responding

**Print these instructions now and keep them with your computer for reference later.**

**Problem:** My computer is unresponsive (I cannot use the ThinkPad pointing device or the keyboard).

**Solution:** Do the following:

1. Press and hold the power button until the computer turns off. If you cannot turn off the computer by pressing the power button, remove the ac power adapter and the removable battery. After the computer is turned off, reconnect the ac power adapter and reinstall the removable battery, and then restart the computer by pressing the power button. If the computer does not turn on, continue with step 2.
2. While the computer is turned off, remove all power sources from the computer (removable battery and the ac power adapter). Plug in the ac power adapter while keeping the removable battery out of the computer. If the computer does not turn back on, continue with step 3.

**Note:** When the computer starts up and enters the Windows environment, use the proper shutdown procedure to turn off the computer. When the computer is off, reattach the removable battery and restart the computer. If the computer does not start with the removable battery reattached, remove the removable battery and again start with step 2. If the computer starts with ac power but does not start when the removable battery is attached, call the Customer Support Center for support.

3. While the computer is off, remove all sources of power (removable battery and the ac power adapter). Remove all external devices that are attached to your computer (keyboard, mouse, printer, scanner, and so on). Repeat step 2. If step 2 is unsuccessful, continue with step 4.

**Note:** The following steps involve removing static sensitive components from your computer. Make sure that you are properly grounded and remove all sources of power attached to the computer. If you are uncomfortable or unsure about removing components, call the Customer Support Center for assistance.

4. While the computer is off, remove all sources of power and external hardware. Remove any non-original memory module added to your computer. After removing the extra memory module and reinstalling the original memory module, repeat step 2. If the computer still does not turn on, consult the user manual for other customer-replaceable components that are attached to your computer.

If the computer still does not start up, call the Customer Support Center and a Customer Support Specialist will assist you.

## Spills on the keyboard

**Problem:** I spill something on the computer.

**Solution:** Because most liquids conduct electricity, liquid spilled on the keyboard could create numerous short circuits and damage your computer. To solve the problem, do the following:

1. Ensure that no liquid creates a short circuit between you and the ac power adapter (if in use).
2. Carefully unplug the ac power adapter immediately.
3. Turn off the computer immediately. If the computer does not turn off, remove the removable battery. The more quickly you stop the current from passing through the computer the more likely you will reduce damage from short circuits.

**Attention:** Although you might lose some data or work by turning off the computer immediately, leaving the computer on might make your computer unusable.

4. Wait until you are certain that all the liquid is drained out from the keyboard drainage holes before turning on your computer.

## Error messages

- **Message:** 0177: Bad SVP data, stop POST task.  
**Solution:** Checksum of the supervisor password in the EEPROM is not correct. The system board should be replaced. Have the computer serviced.
- **Message:** 0183: Bad CRC of Security Settings in EFI Variable. Enter ThinkPad Setup.  
**Solution:** Checksum of the Security settings in the EFI Variable is not correct. Enter ThinkPad Setup to check security settings, press F10, and then press Enter to restart the system. If you still have a problem, have the computer serviced.
- **Message:** 0187: EAA data access error  
**Solution:** The access to EEPROM is failed. Have the computer serviced.
- **Message:** 0188: Invalid RFID Serialization Information Area  
**Solution:** The EEPROM checksum is not correct (block # 0 and 1). The system board should be replaced, and the box serial number must be reinstalled. Have the computer serviced.
- **Message:** 0189: Invalid RFID configuration information area  
**Solution:** The EEPROM checksum is not correct (block # 4 and 5). The system board should be replaced, and the universally unique identifier (UUID) must be reinstalled. Have the computer serviced.
- **Message:** 0190: Critical low-battery error  
**Solution:** The computer turned off because the battery power is low. Connect the ac power adapter to the computer and charge the batteries.
- **Message:** 0191: System Security - Invalid remote change requested  
**Solution:** The system configuration change has failed. Confirm the operation and try again. To clear the error, enter ThinkPad Setup.
- **Message:** 0199: System Security - Security password retry count exceeded.  
**Solution:** This message is displayed if you enter a wrong supervisor password more than three times. Confirm the supervisor password and try again. To clear the error, enter ThinkPad Setup.
- **Message:** 0270: Real Time Clock Error.  
**Solution:** System Real Time Clock is not functional. Have the computer serviced.
- **Message:** 0271: Check Date and Time settings  
**Solution:** The date or the time is not set in the computer. Enter ThinkPad Setup and set the date and time.

- **Message:** 1902: Unauthorized network card is plugged in - Power off and remove the network card.  
**Solution:** The wireless network card is not supported on this computer. Remove it.
- **Message:** 1920: More than one external fingerprint readers are attached.  
**Solution:** Turn off and remove all but the reader that you set up within your main operating system.
- **Message:** 2100: Detection error on HDD0 (Main HDD)  
**Solution:** The hard disk drive is not working. Have the hard disk drive serviced.
- **Message:** 2101: Detection error on SSD1 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2102: Detection error on SSD2 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2110: Read error on HDD0 (Main HDD)  
**Solution:** The hard disk drive is not working. Have the hard disk drive serviced.
- **Message:** 2111: Read error on SSD1 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2112: Read error on SSD2 (M.2)  
**Solution:** The M.2 solid-state drive is not working. Have the M.2 solid-state drive serviced.
- **Message:** 2200: Machine Type and Serial Number are invalid.  
**Solution:** Machine Type and Serial Number are invalid. Have the computer serviced.
- **Message:** 2201: Machine UUID is invalid.  
**Solution:** Machine UUID is invalid. Have the computer serviced.
- **Message:** Fan error  
**Solution:** Cooling fan has failed. Shut down the computer immediately and have the computer serviced.
- **Message:** Thermal sensing error  
**Solution:** The thermal sensor has a problem. Shut down the computer immediately and have the computer serviced.
- **Message:** Bottom cover tamper detection error  
**Solution:** The bottom cover tamper switch is not working. Have the computer serviced.
- **Message:** Error: The non-volatile system UEFI variable storage is nearly full.

**Note:** This error indicates that the operating system or programs cannot create, modify, or delete data in the non-volatile system UEFI variable storage due to insufficient storage space after POST.

The non-volatile system UEFI variable storage is used by the UEFI BIOS and by the operating system or programs. This error occurs when the operating system or programs store large amounts of data in the variable storage. All data needed for POST, such as BIOS setup settings, chipset, or platform configuration data, are stored in a separate UEFI variable storage.

**Solution:** Press F1 after the error message is displayed to enter ThinkPad Setup. A dialog asks the user for confirmation to clean up the storage. If the user selects "Yes", all data that were created by the operating system or programs will be deleted except global variables defined by the Unified Extensible Firmware Interface Specification. If the user selects "No", all data will be kept, but the operating system or programs will not be able to create, modify, or delete data in the storage.

If the error happens at a service center, Lenovo authorized service personnel will clean up the non-volatile system UEFI variable storage using the preceding solution.

## Beep errors

Lenovo SmartBeep technology enables you to decode beep errors with your smartphone when a black screen occurs with beeps from your computer. To decode the beep error with Lenovo SmartBeep technology, do the following:

1. Go to <https://support.lenovo.com/smartbeep> or scan the following QR Code.



2. Download the proper diagnostic app and install it on your smartphone.
3. Run the diagnostic app and place the smartphone near the computer.
4. Press the F11 key on your computer to emit the beep again. The diagnostic app decodes the beep error and shows possible solutions on the smartphone.

The following section describes some beep errors and the corresponding solutions.

**Note:** Do not attempt to service a product yourself unless instructed to do so by the Customer Support Center or product documentation. Only use a Lenovo-authorized service provider to repair your product.

Error codes	Solutions
3001: Reset error (platform reset not de-asserted)	<ol style="list-style-type: none"><li>1. Remove all power resources (the ac power adapter, removable battery, and coin-cell battery). If your computer has a built-in battery, reset the computer by inserting a straightened paper clip into the emergency-reset hole. Wait for one minute. Then reconnect all power resources.</li><li>2. Replace the system board (service provider only).</li></ol>
0002: Internal bus error	Replace the system board (service provider only).
0281: General embedded controller error	Replace the system board (service provider only).
0282: Memory module error	<ol style="list-style-type: none"><li>1. Reinstall or replace the memory module.</li><li>2. Replace the system board (service provider only).</li></ol>
0283: PCI resource error	<ol style="list-style-type: none"><li>1. Remove PCIe devices (the M.2 card, PCIe card, and so on) (service provider only).</li><li>2. Replace the system board (service provider only).</li></ol>
0284: TCO-compliant functionality-related error (might be the BIOS code validation failure)	Replace the system board (service provider only).
0285: TCO-compliant functionality-related error (might be the TPM initialization failure)	Replace the system board (service provider only).
0286: Integrated graphics error	Replace the system board (service provider only).

Error codes	Solutions
0287: Discrete graphics error	<ol style="list-style-type: none"><li>1. Reinstall or replace the discrete graphics card (service provider only).</li><li>2. Replace the system board (service provider only).</li></ol>
0288: Computer display error	<ol style="list-style-type: none"><li>1. Reconnect the display cable on both the system board side and the computer display side (service provider only).</li><li>2. Replace the system board (service provider only).</li></ol>

## Memory module problems

Print these instructions now and keep them with your computer for reference later.

**Problem:** My memory module is not operating properly.

**Solution:** Check the following items:

1. Verify that the memory module is installed and seated correctly in your computer.  
Remove all added memory modules to test the computer with only the factory-installed memory modules, and then reinstall the memory module one at a time to ensure a proper connection.
2. Check for error messages during startup.  
Follow the appropriate corrective actions for power-on self-test (POST) error messages.
3. Verify that the latest UEFI BIOS for your model has been installed.
4. Verify the proper memory configuration and compatibility including the maximum memory size and the memory speed.
5. Run diagnostic programs. See "Diagnosing problems with Lenovo Companion" on page 77.

## Ethernet problems

- **Problem:** My computer cannot connect to the network.

**Solution:**

Ensure that:

- The cable is installed correctly.  
The network cable must be securely connected both to the Ethernet connector of your computer and to the RJ45 connector of the hub. The maximum allowable distance from the computer to hub is 100 m (328 ft), if the cable is connected and the distance is within the acceptable limits but the problem persists, try a different cable.
- You are using the correct device driver. To install the correct driver, do the following:
  1. Go to Control Panel, and ensure that you view Control Panel by Category.
  2. Click **Hardware and Sound** → **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
  3. Double-click **Network adapters** to view all network adapters. If an exclamation mark ! is displayed next to the adapter name, you might not be using the correct driver or the driver might have been disabled.
  4. Right-click the highlighted adapter, click **Update driver**, and then follow the instructions on the screen to update the driver.
- The switch port and the adapter have the same duplex setting.

If you configured the adapter for full duplex, ensure that the switch port also is configured for full duplex. Setting a wrong duplex mode can degrade performance, cause data loss, or result in lost connections.

- You have installed all networking software that is necessary for your network environment.  
Check with your LAN administrator for the necessary networking software.
- **Problem:** The adapter stops working for no apparent reason.  
**Solution:** The network driver files might be corrupt or missing.
- **Problem:** My computer is a Gigabit Ethernet model and I use a speed of 1000 Mbps, the connection fails or errors occur.  
**Solution:**
  - Use Category 5 wiring and ensure that the network cable is securely connected.
  - Connect to a 1000 BASE-T hub/switch (not 1000 BASE-X).
- **Problem:** The Wake on LAN feature is not working.  
**Solution:** Ensure that Wake on LAN is enabled in ThinkPad Setup. If it is, check with your LAN administrator for the necessary settings.
- **Problem:** My computer is a Gigabit Ethernet model, but it cannot connect to the network at 1000 Mbps. Instead, it connects at 100 Mbps.  
**Solution:**
  - Try another Ethernet cable.
  - Ensure that the link partner is set to auto-negotiate.
  - Ensure that the switch is 802.3ab-compliant (gigabit over copper).

### Wireless-LAN problem

**Problem:** I cannot connect to the network using the built-in wireless network card.

**Solution:** Ensure that:

- The Airplane mode is off.
- Your wireless-LAN driver is the latest version.
- Your computer is within the range of a wireless access point.
- The wireless radio is enabled.

### Wireless-WAN problem

**Problem:** A message is displayed indicating that an unauthorized WAN card is installed.

**Solution:** The WAN card is not supported on this computer. Remove the WAN card. For more information, see "Replacing a wireless-WAN card" on page 114.

**Note:** Some models do not have a wireless-WAN card.

### Bluetooth problem

**Note:** Check your connection anytime and ensure that no other Bluetooth-enabled device is searching for the device to which you want to connect. Simultaneous searching is not allowed in the Bluetooth connection.

**Problem:** Sound does not come from the Bluetooth headset/headphones but comes from the local speaker even though the Bluetooth headset/headphones is connected using a headset profile or AV profile.

**Solution:** Do the following:

1. Exit the program that uses the sound device (for example, Windows Media Player).
2. Go to Control Panel, and ensure that you view Control Panel by Category.
3. Click **Hardware and Sound** → **Sound** → **Playback**.
4. If you are using a Headset profile, select **Bluetooth Hands-free Audio** and click **Set Default**. If you are using an AV profile, select **Stereo Audio** and click **Set Default**.
5. Click **OK** to close the Sound window.

### ThinkPad pointing device problems

- **Problem:** The pointer drifts when the computer is turned on or after it resumes normal operation.  
**Solution:** The pointer might drift when you are not using the TrackPoint pointing device during normal operation. This is a normal characteristic of the TrackPoint pointing device and is not a defect. Pointer drifting might occur for several seconds under the following conditions:
  - When the computer is turned on
  - When the computer resumes normal operation
  - When the TrackPoint pointing device is kept pressed for a long time
  - When the temperature changes
- **Problem:** The TrackPoint pointing device or trackpad does not work.  
**Solution:** Ensure that the TrackPoint pointing device or trackpad is enabled in the Mouse Properties window. For more information, see "Customizing the ThinkPad pointing device" on page 23.

### Keyboard problems

- **Problem:** All or some keys on the keyboard do not work.  
**Solution:** If an external numeric keypad is connected:
  1. Turn off the computer.
  2. Remove the external numeric keypad.
  3. Turn on the computer and try using the keyboard again.If the keyboard problem is resolved, carefully reconnect the external numeric keypad.  
If the problem persists, ensure that the correct device driver is installed by doing the following:
  1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
  2. Click **Keyboard**.
  3. Click the **Hardware** tab. In the **Device Properties** section, ensure that you see this message: Device Status: This device is working properly.If keys on the keyboard still do not work, have the computer serviced.
- **Problem:** All or some keys on the external numeric keypad do not work.  
**Solution:** Ensure that the external numeric keypad is correctly connected to the computer.
- **Problem:** The keys on the top row of the numeric keypad might not function the same as the icon printed on each key.  
**Solution:** Do the following:
  1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
  2. Click **Keyboard**. In the Keyboard Properties window, click the **Fn and function keys** tab.

**Note:** If the **Fn and function keys** tab is not displayed, connect your computer to the Internet. Then download and install the ThinkPad Hotkey Features program from the Lenovo Support Web site. For more information, see "Installing device drivers" on page 60.

3. In the **How to use Fn key combinations** section, select your preferred option.
4. If you select **Fn sticky method**, press Fn to reset the Fn sticky status.
5. Try to press keys on the top row of the numeric keypad again to check if the problem is resolved.

## Computer screen problems

- **Problem:** My screen keeps blanking when I do not want it to.

**Solution:** Do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound** → **Power Options**.
3. Show the additional plans, and then select **High performance**.

- **Problem:** When I turn on the computer, nothing is displayed on the screen and the computer does not beep while starting up.

**Note:** If you are not sure whether you heard any beeps, turn off the computer by pressing and holding the power button for four seconds or more. Then turn on the computer and listen again.

**Solution:** Ensure that:

- The battery is installed correctly.
- The ac power adapter is connected to the computer and the power cord is plugged into a working electrical outlet.
- The computer is turned on. (Press the power button again for confirmation.)
- The brightness level of the screen is appropriately set.

If a power-on password is set, press any key to display the prompt for the power-on password and then type the correct password and press Enter.

If these items are correctly set, and the screen remains blank, have the computer serviced.

- **Problem:** When I turn on the computer, only a white cursor is displayed on a blank screen.

**Solution:** If you have modified a partition on your hard disk drive by using partition software, information about that partition, or the master boot record might have been destroyed.

Do the following to try to solve the problem:

1. Turn off the computer, and then turn it on again.
2. If you still see only the cursor on the screen, do the following:
  - If you have used partition software, examine the partition on the hard disk drive by using the software, and recover the partition if required.
  - Use the recovery solutions to restore the system to the factory default state. For more information, see Chapter 8 "Recovery information" on page 95.

If the problem persists, have the computer serviced.



- **Problem:** The screen goes blank while the computer is on.

**Solution:** Your screen saver or power management might have been enabled. Do one of the following:

- Touch the TrackPoint pointing device or the trackpad, or press a key to exit the screen saver.
- Press the power button to resume the computer from sleep or hibernation mode.

- **Problem:** The screen is blank.

**Solution:** Do the following:

1. Press the display-mode switching key  to bring up the image.
2. If you are using the ac power adapter, or using the battery and the battery gauge shows that the battery is not depleted, press the brightness-up key  to make the screen brighter.
3. If your computer is in sleep mode, press Fn to resume the computer from sleep mode.
4. If the problem persists, follow the solution for the following problem.

- **Problem:** The screen is unreadable or distorted.

**Solution:** Ensure that:

- The display device driver is installed correctly.
- The screen resolution and color quality are correctly set.
- The monitor type is correct.

To check these settings, do the following:

1. Right-click on the desktop, and then click **Display settings** → **Display**.

**Note:** If your computer cannot detect the external monitor, click **Detect** in the Display window.

2. Select the external monitor and set **Resolution**.
3. Click **Display adapter properties**.
4. Click the **Monitor** tab. Check the monitor information to make sure that the monitor type is correct. If it is, click **OK** to close the window; otherwise proceed with the following steps.
5. If more than two monitor types are displayed, select **Generic PnP Monitor** or **Generic Non-PnP Monitor**.
6. Click **Properties**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
7. Click the **Driver** tab.
8. Click **Update Driver**.
9. Click **Browse my computer for driver software**, and then click **Let me pick from a list of available drivers on my computer**.
10. Clear the **Show compatible hardware** check box.
11. Select the correct manufacturer and model for the external monitor. If you cannot find your monitor on the list, stop the installation of this driver and use the driver shipped with your monitor.
12. After updating the driver, click **Close**.

- **Problem:** Incorrect characters are displayed on the screen.

**Solution:** Ensure that you install the operating system and program correctly. If the problem persists, have the computer serviced.

- **Problem:** I try to turn off my computer but the screen stays on and I cannot completely turn off my computer.


**Solution:** Press and hold the power button for four seconds or more to turn off the computer.

- **Problem:** Missing, discolored, or bright dots appear on the screen every time I turn on my computer.

**Solution:** This is an intrinsic characteristic of the TFT technology. Your computer display contains multiple thin-film transistors (TFTs). Only a very small number of missing, discolored, or bright dots on the screen might exist all the time.

## External monitor problems

- **Problem:** The external monitor is blank.

**Solution:** To bring up the image, press the display-mode switching key  and select the monitor you want. If the problem persists, do the following:

1. Connect the external monitor to another computer to ensure that it works.
2. Reconnect the external monitor to your computer.
3. See the manual shipped with the external monitor to check the resolutions and refresh rates that are supported.
  - If the external monitor supports the same resolution as the computer display or a higher resolution, view output on the external monitor or on both the external monitor and the computer display.
  - If the external monitor supports a lower resolution than the computer display, view output on the external monitor only. (If you view output on both the computer display and the external monitor, the external monitor screen will be blank or distorted.)

- **Problem:** I cannot set a higher resolution than the present one on my external monitor.

**Solution:** Ensure that the monitor information is correct. If necessary, update the monitor driver.

- **Problem:** The screen is unresizable or distorted.

**Solution:** Ensure that:

- The monitor information is correct and the appropriate monitor type is selected. If necessary, update the monitor driver.
- Ensure that an appropriate refresh rate is selected by doing the following:
  1. Connect the external monitor to the monitor connector, and then connect the monitor to an electrical outlet.
  2. Turn on the external monitor and the computer.
  3. Right-click on the desktop, and then click **Display settings** → **Advanced display settings**.

**Note:** If your computer cannot detect the external monitor, click **Detect** in the Display window.

4. Click the icon for the appropriate monitor (**Monitor-2** icon is for the external monitor).
  5. Click **Display adapter properties**.
  6. Click the **Monitor** tab.
  7. Select the correct screen refresh rate.
- **Problem:** Wrong characters are displayed on the screen.

**Solution:** Enable the Extend desktop function. See "Using an external display" on page 33.

- **Problem:** I am using the Extend desktop function, but I cannot set a higher resolution or higher refresh rate on the secondary display.
- Solution:** Change the resolution and the color depth to lower settings for the primary display. See "Using an external display" on page 33.
- **Problem:** Display switching does not work.
- Solution:** If you use the Extend desktop function, disable it, and change the display output location. If a DVD movie or a video clip is playing, stop the playback, close the program, and then change the display output location.

- **Problem:** The screen position on the external monitor is incorrect when that monitor is set for a high resolution.

**Solution:** Sometimes, when you use a high-resolution pixel, the image is shifted to the left or right on the screen. To correct this, first ensure that your external monitor supports the display mode (the resolution and the refresh rate) that you have set. If it does not, set a display mode that the monitor supports. If it does support the display mode you have set, go to the setup menu for the monitor itself and adjust the settings there. Usually the external monitor has buttons for access to the setup menu. For more information, see the documentation that comes with the monitor.

## Audio problems

- **Problem:** Wave or MIDI sound does not play properly.

**Solution:** Ensure that the built-in audio device is configured correctly.

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.
4. Double-click **Sound, video and game controllers**.
5. Ensure that the device following **Sound, video and game controllers** is enabled and configured correctly.

- **Problem:** Recordings made by using the microphone input are not loud enough.

**Solution:** Ensure that the Microphone Boost function is turned on and set by doing the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click **Sound**.
4. Click the **Recording** tab in the Sound window.
5. Select **Internal Microphone**, and click **Properties**.
6. Click the **Levels** tab, and move the Microphone Boost slider upwards.
7. Click **OK**.

**Note:** For more information about controlling volume, see your Windows online help.

- **Problem:** I cannot move the volume slider or balance slider.

**Solution:** The slider might be grayed out. This means that its position is fixed by the hardware and cannot be changed.

- **Problem:** The volume sliders do not stay in place when some audio programs are used.

**Solution:** It is normal for the sliders to change position when certain sound programs are used. The programs are aware of the settings in the Volume Mixer window and are enabled to change the settings themselves. An example is the Windows Media Player program. Usually the program has sliders available to control the sound from within the program.

- **Problem:** The balance slider cannot completely mute one channel.

**Solution:** The control is designed to compensate for minor differences in balance and does not completely mute either channel.

- **Problem:** There is no volume control for MIDI sound in the Volume Mixer window.

**Solution:** Use the hardware volume control. This is because the built-in synthesizer software does not support the control.

- **Problem:** The sound cannot be turned off even if I set the Master volume control at minimum.

**Solution:** You still can hear some sound even though you have set the Master volume control at minimum. To turn off the sound completely, go to the Master volume control and select **Mute Speaker/HP**.

- **Problem:** When I connect headphones to my computer while playing sound, a speaker does not produce sound.

**Solution:** When the headphones are attached, the streaming is automatically redirected to it. If you want to listen to sound from the speakers again, ensure that you set those speakers as the default device. For more information, see the help information system for Realtek HD Audio Manager.

- **Problem:** Sound does not come from a headphone or a speaker, or the computer cannot record sounds.

**Solution:** To switch from one device to another (for example, from a speaker to a headphone, or from an external microphone to a built-in microphone), do the following:

1. Go to Control Panel, and ensure that you view Control Panel by Category.
2. Click **Hardware and Sound**.
3. Click the **SmartAudio** icon.
4. Ensure that the computer is in MULTI-STREAM mode in the Device advanced settings window.
5. In the Volume Mixer window, select the device you want, for example, speakers.
6. Play any sound through a music program (for example, Windows Media Player). Ensure that sound comes from the speakers now.
7. Then, if you would like to switch to a headphone, close the music program.
8. Go to the Volume Mixer window. Then select another device (for example, the headphone).
9. Play any sound through the music program. Ensure that sound comes from the headphone attached directly to the system. For more information, see the help information system of the SmartAudio program.

**Note:** The Volume Mixer window of SmartAudio displays all audio devices detected in the system, such as speakers for a playback device, or a built-in microphone for a recording device. A check mark beside the audio device shows that the device has been selected.

### Fingerprint reader problems

- **Problem:** The surface of the reader is dirty, stained, or wet.

**Solution:** Gently clean the surface of the reader with a dry, soft, lint-free cloth.

- **Problem:** The reader often fails to enroll or authenticate your fingerprint.

**Solution:** If the surface of the reader is dirty, stained, or wet, gently clean the surface of the reader with a dry, soft, lint-free cloth.

For tips on how to maintain the fingerprint reader, see "Using the fingerprint reader" on page 54.

### Battery problems

- **Problem:** The battery cannot be fully charged in the standard charge time when the computer is powered off.

**Solution:** The battery might be over-discharged. Do the following:

1. Turn off the computer.
2. Ensure that the over-discharged battery is in the computer.
3. Connect the ac power adapter to the computer and let it charge.

If a quick charger is available, use it to charge the over-discharged battery.

If the battery cannot be fully charged in 24 hours, use a new battery.

- **Problem:** The computer shuts down before the battery status icon shows that the battery is empty.

**Solution:** Discharge and recharge the battery.

- **Problem:** The computer operates after the battery status icon shows that the battery is empty.

**Solution:** Discharge and recharge the battery.

- **Problem:** The operating time for a fully charged battery is short.

**Solution:** Discharge and recharge the battery. If your battery operating time is still short, use a new battery.

- **Problem:** The computer does not operate with a fully charged battery.

**Solution:** The surge protector in the battery might be active. Turn off the computer for one minute to reset the protector, then turn on the computer again.

- **Problem:** The battery cannot get charged.

**Solution:** You cannot charge the battery when it is too hot. If the battery feels hot, remove it from the computer and wait for a while to let it cool to room temperature. After it cools, reinstall it and recharge the battery. If it still cannot be charged, have it serviced.

### ac power adapter problem

**Problem:** The ac power adapter is connected to the computer and the working electrical outlet, but the power adapter (power plug) icon is not displayed in the Windows notification area. The ac power indicator also does not light up.

**Solution:** Do the following:

1. Ensure that the connection of the ac power adapter is correct. For instructions on how to connect the ac power adapter, see Using the ac power adapter.
2. If the connection of the ac power adapter is correct, turn off the computer, and then disconnect the ac power adapter and remove the removable battery.
3. Reinstall the battery and reconnect the ac power adapter, and then turn on the computer.
4. If the power adapter icon still is not displayed in the Windows notification area, have the ac power adapter and your computer serviced.

### Power problems

**Print these instructions now and keep them with your computer for reference later.**

- **Problem:** My computer is getting no power at all.

**Solution:** Check the following items:

1. Verify the power button. The power button is illuminated whenever the computer is on.
2. Check all power connections. Remove any power strips and surge protectors to connect the ac power adapter directly to the ac power outlet.
3. Inspect the ac power adapter. Check for any physical damage, and ensure that the power cable is firmly attached to the adapter brick and the computer.
4. Verify that the ac power source is working by attaching another device to the outlet.

- **Problem:** My computer does not run on battery power.

**Solution:** Check the following items:

1. Remove and reinstall the removable battery to ensure that it is properly connected.
2. If the battery runs out of power, attach the ac power adapter to recharge the battery.
3. If the battery is charged but the computer does not run, replace the battery with a new one.

- **Problem:** The system does not respond, and I cannot turn off the computer.



**Solution:** Turn off the computer by pressing and holding the power button for four seconds or more. If the computer still does not respond, remove the ac power adapter and the battery.

## Power button problem

**Problem:** The system does not respond, and I cannot turn off the computer.


**Solution:** Turn off the computer by pressing and holding the power button for four seconds or more. If the system still does not respond, remove the ac power adapter and reset the system by inserting one end of a needle or a straightened paper clip into the emergency-reset hole. To locate the emergency-reset hole, see "Bottom view" on page 5.

## Boot problems

Print these instructions now and keep them with your computer for reference later.

- Problem:** I receive an error message before the operating system loads.  
**Solution:** Follow the appropriate corrective actions for power-on self-test (POST) error messages.
- Problem:** I receive an error message while the operating system is loading the desktop configuration after the POST is completed.  
**Solution:** Find solutions by searching for the error message at the following Web sites:
  - <http://www.lenovo.com/support>
  - <http://support.microsoft.com/>

## Sleep and hibernation problems

- Problem:** The computer enters sleep mode unexpectedly.  
**Solution:** If the microprocessor overheats, the computer automatically enters sleep mode to allow the computer to cool and to protect the microprocessor and other internal components. Check the settings for sleep mode.
- Problem:** The computer enters sleep mode immediately after the power-on self-test.  
**Solution:** Ensure that:
  - The battery is charged.
  - The operating temperature is within the acceptable range. See "Operating environment" on page 12.If the problem persists, have the computer serviced.
- Problem:** A critical low-battery error occurs, and the computer immediately turns off.  
**Solution:** The battery power is getting low. Plug the ac power adapter into an electrical outlet and then into the computer. Alternatively, replace the battery with a charged one.
- Problem:** The computer display remains blank after you press Fn to resume from sleep mode.  
**Solution:** Check whether an external monitor was disconnected or turned off while the computer was in sleep mode. If you disconnected or turned off the external monitor, connect it or turn it on before resuming the computer from sleep mode. When resuming the computer from sleep mode without attaching the external monitor or turning it on, and the computer display remains blank, press the display-mode switching key  to bring up the computer display.
- Problem:** The computer does not resume from sleep mode, or the system status indicator blinks slowly and the computer does not work.  
**Solution:** If the system does not resume from sleep mode, it might have entered sleep or hibernation mode automatically because the battery is depleted. Check the system status indicator.

- If the system status indicator blinks slowly, your computer is in sleep mode. Connect the ac power adapter to the computer; then press Fn.
- If the system status indicator is off, your computer has no power or is in hibernation mode. Connect the ac power adapter to the computer; then press the power button to resume operation.

If the system still does not resume from sleep mode, your system might stop responding and you might not be able to turn off the computer. In this case, you must reset the computer. If you have not saved your data, it might be lost. To reset the computer, press and hold the power button for four seconds or more. If the system still does not respond, remove the ac power adapter and the battery.

- Problem:** Your computer does not enter sleep or hibernation mode.  
**Solution:** Check whether any option has been selected to disable your computer from entering sleep or hibernation mode.  
If your computer tries to enter sleep mode but the request is rejected, the device attached to the USB connector might have been disabled. If this occurs, do a hot-unplug-and-plug operation for the USB device.
- Problem:** The battery discharges slightly while the computer is in hibernation mode.  
**Solution:** If the wakeup function is enabled, the computer consumes a small amount of power. This is not a defect. For more information, see "Power-saving modes" on page 26.

## Hard disk drive problems

- Problem:** The hard disk drive makes a rattling noise intermittently.  
**Solution:** The rattling noise might be heard:
  - When the hard disk drive begins or finishes getting access to data
  - When you carry the hard disk drive
  - When you carry your computerThis is a normal characteristic of a hard disk drive and is not a defect.
- Problem:** The hard disk drive does not work.  
**Solution:** On the **Startup** menu of ThinkPad Setup, ensure that the hard disk drive is on the **Boot priority** order list. If it is on the **Excluded from boot order** list, it is disabled. Select the entry for it on the list and press Shift+F1 to move it back to the **Boot priority** order list.
- Problem:** After I have set a hard disk password, I move the hard disk drive to another computer but cannot unlock the hard disk password on the new computer.  
**Solution:** Your computer supports an enhanced password algorithm. Computers older than yours might not support such a security function.

## Solid-state drive problem

**Problem:** When you compress files or folders by use of the data compression function in the Windows operating system, and then decompress them, the process of writing to or reading from the files or folders is slow.

**Solution:** Apply the disk defragmentation tool in the Windows operating system for faster access to the data.

## Software problem

**Problem:** A program does not run properly.

**Solution:** Ensure that the problem is not being caused by the program.

Check that your computer has the minimum required memory to run the program. See the manuals supplied with the program.

Check the following:

- The program is designed to operate with your operating system.
- Other programs run properly on your computer.
- The necessary device drivers are installed.
- The program works when it is run on some other computer.

If an error message is displayed while you are using the program, see the manuals or help system supplied with the program.

If the program still does not run properly, contact your place of purchase or a service representative for help.

### USB problem

**Problem:** A device connected to the USB connector does not work.

**Solution:** Ensure that the USB port is enabled in the ThinkPad Setup. Open the Device Manager window. Ensure that the USB device setup is correct, and that the assignment of computer resource and the installation of the device driver are correct. To open the Device Manager window, go to Control Panel and ensure that you view Control Panel by Category, and click **Hardware and Sound** → **Device Manager**. If you are prompted for an administrator password or confirmation, type the password or provide confirmation.

Refer to "Diagnosing problems with Lenovo Companion" on page 77 and run a diagnostic test of the USB connector.

### Docking station problem

**Problem:** The computer does not start when you try to turn it on, and does not respond when you try to resume operation.

**Solution:** Ensure that:

- The ac power adapter is connected to the docking station.
- The computer is securely attached to the docking station.

---

## Chapter 8. Recovery information

This chapter provides information about the Windows recovery solutions on the Windows 10 operating system.

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### Resetting your computer

If your computer does not perform well, you might consider resetting your computer. In the resetting process, you can choose to keep your files or remove them, and then reinstall the Windows operating system.

To reset your computer, do the following:

**Note:** The items in the graphical user interface (GUI) might change without notice.

1. Open the Start menu, and then click **Settings** → **Update & Security** → **Recovery**.
2. In the **Reset this PC** section, click **Get started**.
3. Follow the instructions on the screen to reset your computer.

---

### Using advanced startup options

The advanced startup options enable you to do the following:

- Change the firmware settings of the computer.
- Change the startup settings of the Windows operating system.
- Start the computer from an external device.
- Restore the Windows operating system from a system image.

To use advanced startup options, do the following:

**Note:** The items in the graphical user interface (GUI) might change without notice.

1. Open the Start menu, and then click **Settings** → **Update & security** → **Recovery**.
2. In the **Advanced startup** section, click **Restart now** → **Troubleshoot** → **Advanced options**.
3. Select a startup option you want, and then follow the instructions on the screen.

---

### Recovering your operating system if Windows 10 fails to start

The Windows recovery environment on your computer operates independently from the Windows 10 operating system. It enables you to recover or repair the operating system even if the Windows 10 operating system fails to start.

After two consecutive failed boot attempts, the Windows recovery environment starts automatically. Then you can choose repair and recovery options by following the on-screen instructions.

**Note:** Ensure that your computer is connected to ac power during the recovery process.

---

### Creating and using a recovery USB drive

You can create a recovery USB drive as a backup for the Windows recovery programs. With the recovery USB drive, you can troubleshoot and fix the problems even if the preinstalled Windows recovery programs are damaged.

It is recommended that you create a recovery USB drive as early as possible. If you did not create a recovery USB drive as a precautionary measure, you can contact Lenovo Customer Support Center and purchase one from Lenovo. For a list of the Lenovo Support phone numbers for your country or region, go to:

<http://www.lenovo.com/support/home>

#### Creating a recovery USB drive

To create a recovery USB drive, you need a USB drive with at least 16 GB of storage capacity. The actual USB capacity that is required depends on the size of the recovery image.

**Attention:** The creation process will delete anything stored on the USB drive. To avoid data loss, make a backup copy of all the data that you want to keep.

To create a recovery USB drive, do the following:

**Note:** Ensure that your computer is connected to ac power during the following process.

1. Connect a proper USB drive (at least 16 GB of storage) to the computer.
2. Type **recovery** in the search box on the taskbar. Then click **Create a recovery drive**.
3. Click **Yes** in the User Account Control window to allow the Recovery Media Creator program to start.
4. In the Recovery Drive window, follow the instructions on the screen to create a recovery USB drive.

#### Using the recovery USB drive

If you cannot start your computer, refer to the corresponding information in the topic "Troubleshooting" on page 78 to try to solve the problem by yourself. If you still cannot start your computer, use the recovery USB drive to recover your computer.

To use a recovery USB drive, do the following:

**Note:** Ensure that your computer is connected to ac power during the following process.

1. Connect the recovery USB drive to the computer.
2. Turn on or restart the computer. Before the Windows operating system starts, repeatedly press F12. The Boot Menu window opens.
3. Select the recovery USB drive as the boot device.
4. Select a preferred keyboard layout.
5. Click **Troubleshoot** to display optional recovery solutions.
6. Select a corresponding recovery solution according to your situation. Then follow the instructions on the screen to complete the process.

---

## Chapter 9. Replacing devices

This chapter provides instructions on how to install or replace hardware for your computer.

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### Customer Replaceable Units

Customer Replaceable Units (CRUs) are parts that can be upgraded or replaced by the customer. ThinkPad computers contain the following types of CRUs:

- **Self-service CRUs:** Refer to parts that can be installed or replaced easily by customer themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be installed or replaced by customers with a greater skill level. Trained service technicians can also provide service to install or replace the parts under the type of warranty designated for the customer's machine.

If you intend on installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You might be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you might be charged for the replacement CRU if Lenovo does not receive the defective CRU within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation at [http://www.lenovo.com/warranty/le\\_02](http://www.lenovo.com/warranty/le_02) for full details.

For the CRU information of your computer, refer to the following list.

**Note:** \* Available on some models.

#### Self-service CRUs

- ac power adapter and power cord
- TrackPoint cap
- Removable battery
- Base cover assembly
- Hard disk drive or SATA solid-state drive \*
- Hard disk drive cable or SATA solid-state drive cable \*
- M.2 solid-state drive \*
- M.2 solid-state drive adapter \*
- M.2 solid-state drive cable \*
- Coin-cell battery

#### Optional-service CRUs

- Keyboard
- Memory module
- Wireless LAN card
- Wireless WAN card \*

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### Static electricity prevention

Static electricity, although harmless to you, can seriously damage computer components and options. Improper handling of static-sensitive parts can cause damage to the part. When you unpack an option or a Customer Replaceable Unit (CRU), do not open the static-protective package until the instructions direct you to install the part.

When you handle options or CRUs, or perform any work inside the computer, take the following precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle components carefully. Handle adapters, memory modules, and other circuit boards by the edges. Never touch exposed circuitry.
- Prevent others from touching the components.
- Before you install a static-sensitive option or CRU, do either of the following to reduce static electricity in the package and your body:
  - Touch the static-protective package that contains the part to a metal expansion-slot cover for at least two seconds.
  - Touch the static-protective package that contains the part to other unpainted metal surface on the computer for at least two seconds.
- When possible, remove the static-sensitive part from the static-protective package and install the part without setting it down. When this is not possible, place the static-protective package on a smooth, level surface and place the part on the package.
- Do not place the part on the computer cover or other metal surface.

---

### Disabling the built-in battery

Before replacing any CRU, ensure that you disable Fast Startup first and then disable the built-in battery.

To disable Fast Startup, do the following:

1. Go to Control Panel, and then change the view of Control Panel from Category to Large icons or Small icons.
2. Click **Power Options**, and then click **Choose what the power buttons do** on the left pane.
3. Click **Change settings that are currently unavailable** at the top.
4. If prompted by User Account Control (UAC), click **Yes**.
5. Clear the **Turn on fast startup** check box, and then click **Save changes**.

To disable the built-in battery, do the following:

1. Restart your computer. When the logo screen is displayed, immediately press F1 to enter ThinkPad Setup.
2. Select **Config** → **Power**. The **Power** submenu is displayed.
3. Select **Disable built-in battery** and press Enter.
4. Select **Yes** in the Setup Confirmation window. The built-in battery is disabled and the computer turns off automatically. Wait three to five minutes to let the computer cool.

---

### Replacing the removable battery

Before you start, read "Important safety information" on page v and print the following instructions.

This system supports only batteries specially designed for this specific system and manufactured by Lenovo or an authorized builder. The system does not support unauthorized batteries or batteries designed for other systems. If an unauthorized battery or a battery designed for another system is installed, the system does not charge and the following message is displayed:

"The battery installed is not supported by this system and will not charge. Replace the battery with the correct Lenovo battery for this system."

**Attention:** Lenovo has no responsibility for the performance or safety of unauthorized batteries, and provides no warranties for failures or damage arising out of their use.






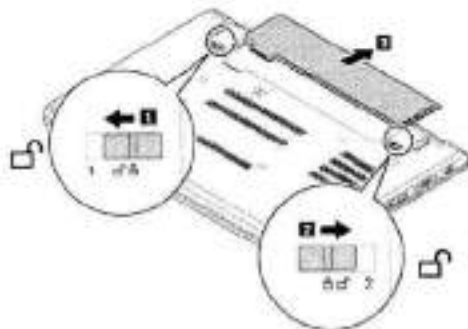
If the rechargeable battery is incorrectly replaced, there is danger of an explosion. The battery contains a small amount of harmful substances. To avoid possible injury:

- Replace only with a battery of the type recommended by Lenovo.
- Keep the battery away from fire.
- Do not expose it to excessive heat.
- Do not expose it to water or rain.
- Do not short-circuit it.
- Do not drop, crush, puncture, or subject to strong forces. Battery abuse or mishandling can cause the battery to overheat, which can cause gases or flame to "vent" from the battery.

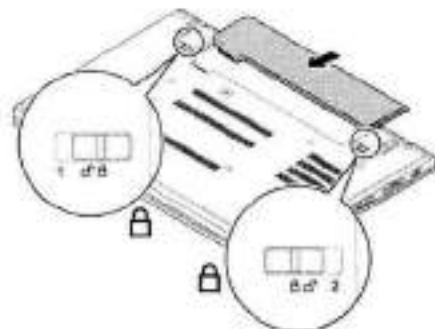
To replace the removable battery, do the following:

**Note:** Depending on the model, your computer might look slightly different from the illustrations in this topic.

1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Slide the latches  to the unlocked position. Then slide and hold the latch . Remove the battery .



5. Insert a new battery until it clicks into place. Ensure that the latches are in the locked positions.



6. Turn the computer over. Connect the ac power adapter and all cables to the computer.

## Replacing the nano-SIM card

Before you start, read "Important safety information" on page v and print the following instructions.

Nano-SIM card is a small plastic card with an Integrated Circuit (IC) chip mounted on one side of the card.

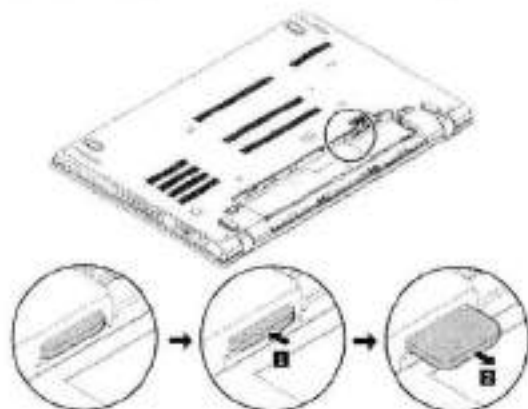
If your computer supports wireless WAN, your computer might require a nano-SIM card to establish wireless WAN connections. Depending on the model, you might need to purchase a nano-SIM card or a nano-SIM card might already be installed in your computer. In some countries or regions, a nano-SIM card is part of the shipping contents that come with your computer.

**Attention:** When installing or removing the nano-SIM card, do not touch the nano-SIM card metal connectors.

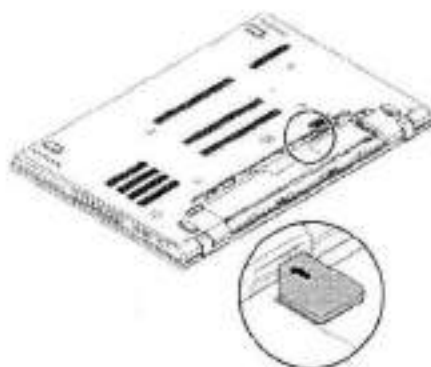
To replace the nano-SIM card, do the following:

1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See ["Replacing the removable battery"](#) on page 98.

5. Gently push the nano-SIM card to eject it  and then slide it out of the slot .



6. Note the orientation of the new nano-SIM card and then insert it into the slot completely until it clicks into position.



7. Reinstall the removable battery.  
8. Turn the computer over. Connect the ac power adapter and all cables to the computer.

### Replacing the base cover assembly

Before you start, read "Important safety information" on page v and print the following instructions.

#### Notes:

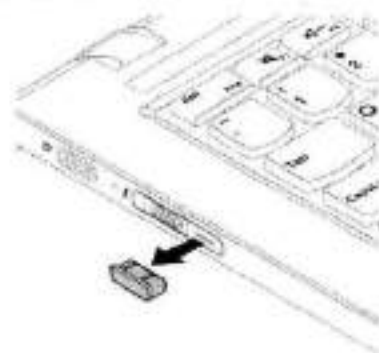
- Depending on the model, your computer might look slightly different from the illustrations in this topic.

- There might be a risk of short circuits if you remove the base cover assembly in the following situations:
  - When your computer has the removable battery installed
  - When your computer is connected to ac power

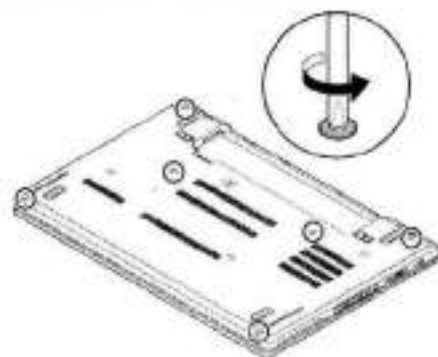
Besides, the computer will not start after you reinstall the base cover assembly. To start the computer, disconnect the ac power adapter and then reconnect it to the computer.

To replace the base cover assembly, do the following:

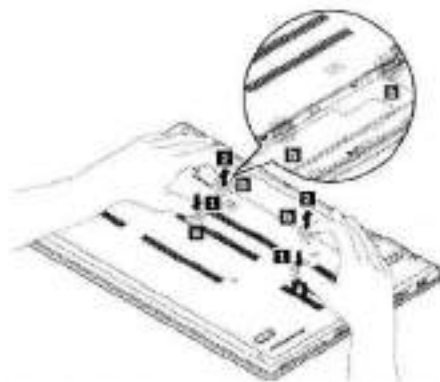
1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Remove the connector cover as shown.



4. Close the computer display and turn the computer over.
5. Remove the removable battery. See ["Replacing the removable battery"](#) on page 86.
6. Loosen the screws that secure the base cover assembly as shown.



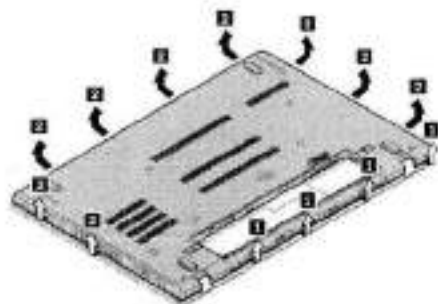
7. Press the locations **1** on the base cover assembly with your thumbs and pivot the hooks **2** upward at the same time to disengage the hooks from the chassis.



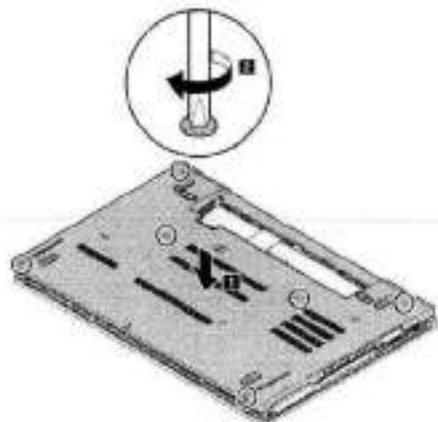
8. Press the location **3** with your thumb and insert your fingers into the holes **4** to pivot this area of the base cover assembly upward as shown. This area of the base cover assembly will be disengaged from the chassis.



9. Remove the base cover assembly in the numeric order as shown.



10. Install the new base cover assembly in place **1**. Ensure that the latches of the base cover assembly are secured under the base cover assembly. Then tighten the screws to secure the base cover assembly **2**.



11. Reinstall the base cover assembly and the removable battery.  
12. Turn the computer over. Connect the ac power adapter and all cables to the computer.

### Replacing a memory module

Before you start, read "Important safety information" on page v and print the following instructions.

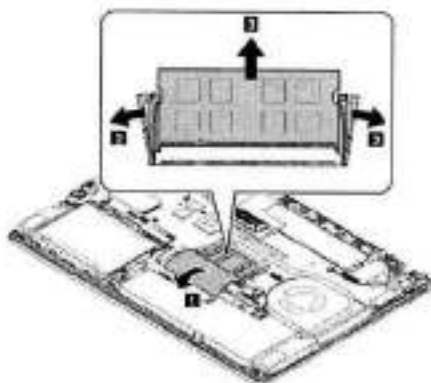
Increasing memory capacity is an effective way to make programs run faster. You can increase memory capacity by replacing or adding a memory module.

#### Attention:

- Before you start the replacement, touch a grounded metal object. This action reduces any static electricity from your body. Static electricity might damage the memory module.
- Do not touch the contact edge of the memory module. Otherwise the memory module might get damaged.

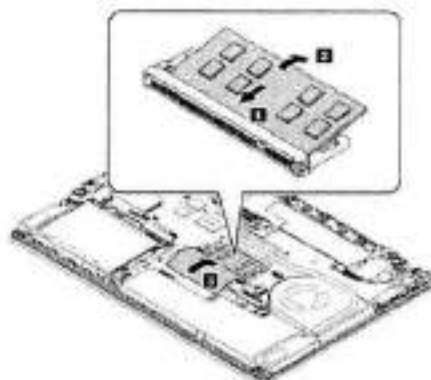
To replace a memory module, do the following:

1. Disable the built-in battery. See *Disabling the built-in battery*.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See *Replacing the removable battery* on page 98.
5. Remove the base cover assembly. See *Replacing the base cover assembly* on page 101.
6. To remove the memory module, do the following:
  - a. Open the film to access the memory module **1**.
  - b. Open the latches on both sides of the memory slot at the same time **2**.
  - c. Remove the memory module **3**.



7. To install a new memory module, do the following:

- a. Place the notched end of the new memory module toward the contact edge side of the memory slot. Then insert the memory module into the slot at an angle of about 20 degrees **1**.
- b. Pivot the memory module downward until it snaps into place **2**. Ensure that the memory module is firmly installed in the slot and cannot be moved easily.
- c. Close the film to protect the new memory module **3**.



8. Reinstall the base cover assembly and the removable battery.
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

## Replacing the internal storage drive

Before you start, read *Important safety information* on page v and print the following instructions.

**Attention:** The internal storage drive (such as hard disk drive, solid-state drive, or hybrid drive) is sensitive. Inappropriate handling might cause damage and permanent loss of data.

When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

**Note:** Depending on your computer model, a 2.5-inch hard disk drive, a 2.5-inch solid-state drive, or an M.2 solid-state drive might come with your computer.

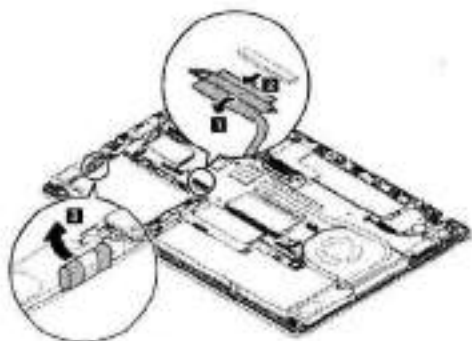
### 2.5-inch storage drive

To remove the 2.5-inch storage drive, do the following:

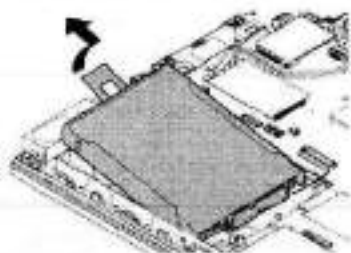
1. Disable the built-in battery. See *Disabling the built-in battery*.
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See *Replacing the removable battery* on page 98.
5. Remove the base cover assembly. See *Replacing the base cover assembly* on page 101.



6. Disconnect the cable from the system board **■** and pull out the tape **■**.



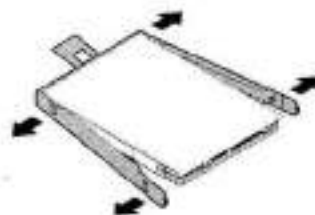
7. Remove the 2.5-inch storage drive by pulling the tape.



8. Disconnect the cable from the 2.5-inch storage drive.

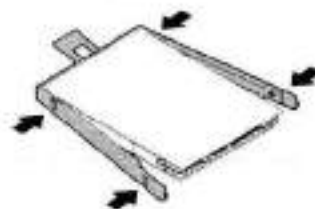


9. Detach the bracket from the 2.5-inch storage drive.



To install the new 2.5-inch storage drive, do the following:

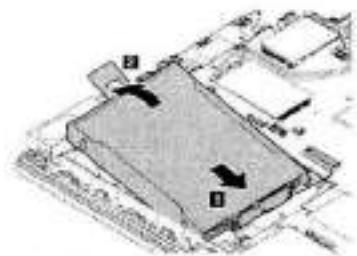
1. Attach the bracket to the new 2.5-inch storage drive.



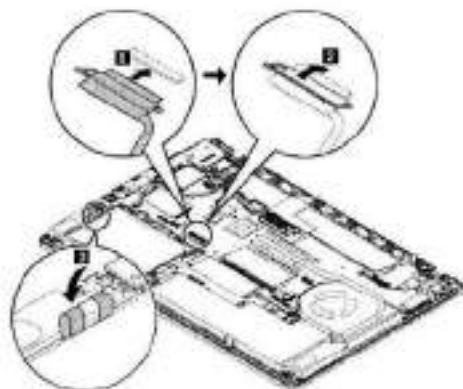
2. Connect the cable to the new 2.5-inch storage drive.



3. Insert the new storage drive **1** and then pivot it downward **2**. Ensure that the new storage drive is seated in place.



4. Connect the cable to the system board **1** and insert the tape **2**.



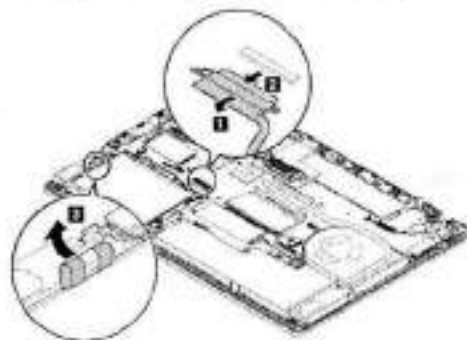
5. Reinstall the base cover assembly and the removable battery.  
6. Turn the computer over. Connect the ac power adapter and all cables.

#### M.2 solid-state drive

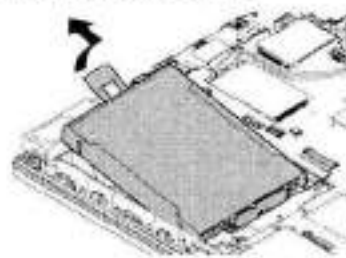
To remove the M.2 solid-state drive, do the following:

1. Disable the built-in battery. See "Disabling the built-in battery."
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See "Replacing the removable battery" on page 98.
5. Remove the base cover assembly. See "Replacing the base cover assembly" on page 101.

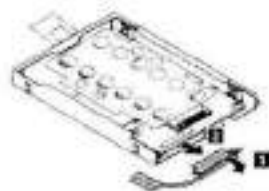
5. Disconnect the cable from the system board **1** and pull out the tape **2**.



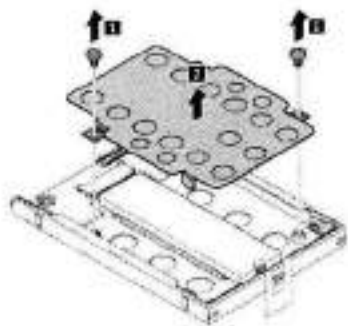
7. Remove the M.2 solid-state-drive adapter by pulling the tape.



8. If you also want to replace the M.2 solid-state-drive cable, disconnect the cable from the M.2 solid-state-drive adapter.



9. Remove the two screws that secure the protective cover **A**, and then remove the cover **B**.



10. Remove the screw that secures the M.2 solid-state drive. The M.2 solid-state drive is released from the secured position and pivots upward.

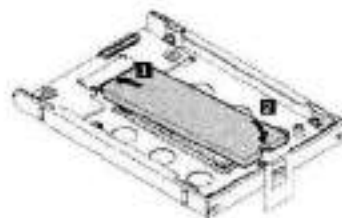


11. Gently pull the M.2 solid-state drive out of the slot.

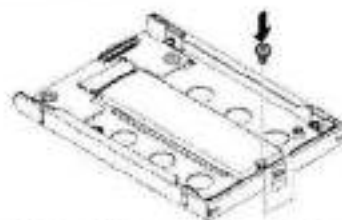


To install the new M.2 solid-state drive, do the following:

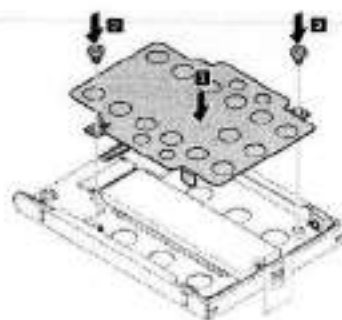
1. Align the notch in the new M.2 solid-state drive with the slot key in the M.2 slot. Insert the solid-state drive into the M.2 slot at an angle of about 20 degrees until it is secured tightly **A** and then pivot it downward **B**.



2. Install the screw to secure the M.2 solid-state drive.



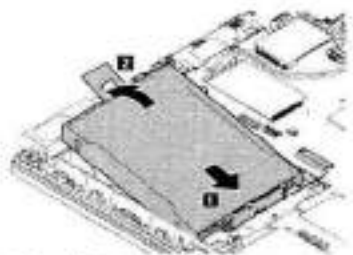
3. Install the protective cover and then install the two screws to secure the cover.



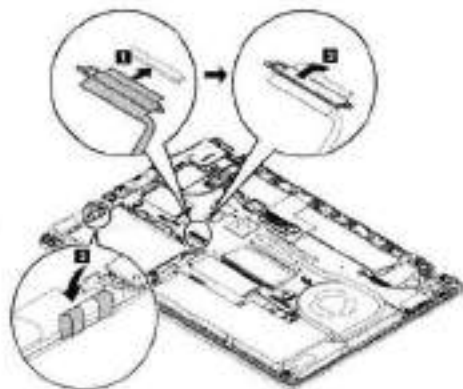
4. If the M.2 solid-state-drive cable has been disconnected, connect the cable to the M.2 solid-state-drive adapter.



5. Insert the adapter **A** and then pivot it downward **B**. Ensure that the adapter is seated in place.



6. Connect the cable to the system board **A** **B** and insert the tape **C**.



7. Reinstall the base cover assembly and the removable battery.  
8. Turn the computer over. Connect the ac power adapter and all cables.

## Replacing a wireless-WAN card

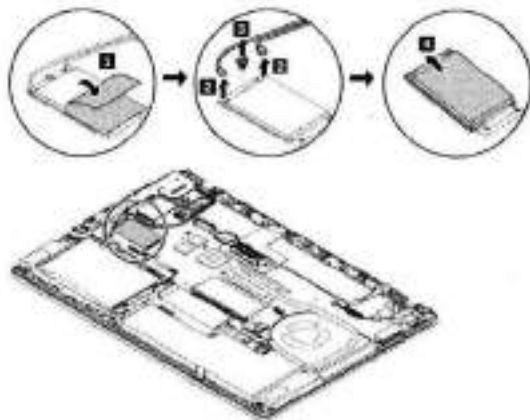
The following information is only applies to computer models with user-installable modules.

Before you start, read "Important safety information" on page v and print the following instructions.

**Attention:** Before you start installing a wireless-WAN card, touch a metal table or a grounded metal object. This action reduces any static electricity from your body. Static electricity could damage the card.

Some computers might come with a wireless-WAN card. To replace the wireless-WAN card, do the following:

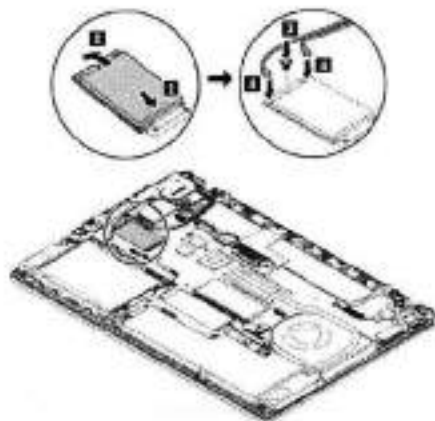
1. Disable the built-in battery. See [Disabling the built-in battery](#).
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See [Replacing the removable battery](#) on page 98.
5. Remove the base cover assembly. See [Replacing the base cover assembly](#) on page 101.
6. To remove the wireless-WAN card, do the following:
  - a. Open the film to access the wireless-WAN card **A**.
  - b. Hold the cable connector with your fingers and gently disconnect each cable from the failing card **B**.
  - c. Remove the screw that secures the wireless-WAN card **C**. The card is released from the secured position and pivots upward.
  - d. Carefully remove the wireless-WAN card out of the slot **D**.



7. To install a new wireless-WAN card, do the following:

- a. Align the notched edge of the new wireless-WAN card with the slot key in the slot. Then carefully insert the card into the slot at an angle about 20 degrees **A**. Pivot the new wireless-WAN card downward **B**.

- b. Install the screw to secure the card in place. Connect the antenna cables to the new wireless-WAN card. Ensure that you connect the orange cable to the main connector on the card, and the blue cable to the auxiliary connector on the card.



8. Reinstall the base cover assembly and the removable battery.  
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

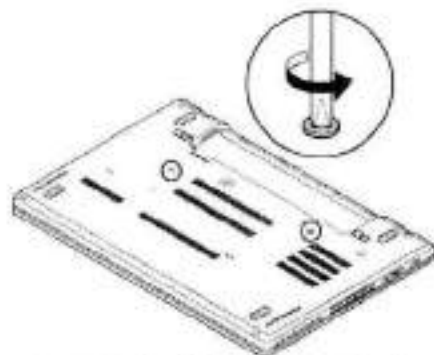
### Replacing the keyboard

Before you start, read "Important safety information" on page v and print the following instructions.

To remove the keyboard, do the following:

1. Disable the built-in battery. See "Disabling the built-in battery."
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See "Replacing the removable battery" on page 96.

5. Loosen the two screws that secure the keyboard.



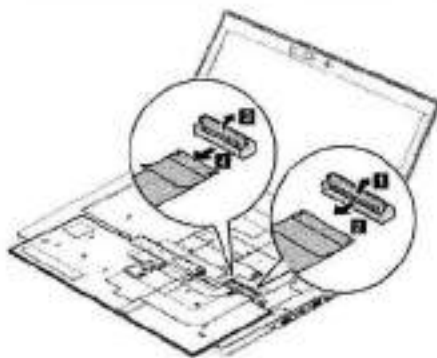
6. Turn the computer over and open the display. Push hard in the direction as shown to release the latches from the keyboard bezel.



7. Pivot the keyboard slightly upward as shown by arrow **A**. Then turn over the keyboard as shown by arrow **B**.

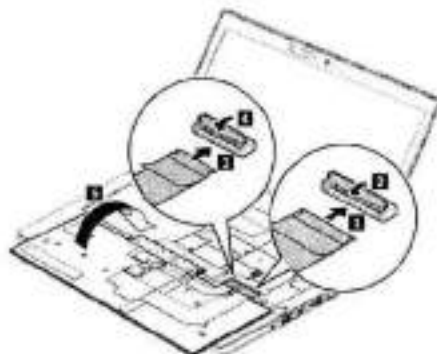


8. Put the keyboard on the palm rest and detach the connectors. Then remove the keyboard.

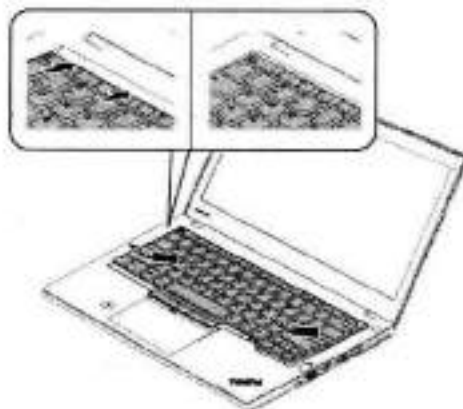


To install the new keyboard, do the following:

1. Attach the connectors, and then turn over the keyboard.



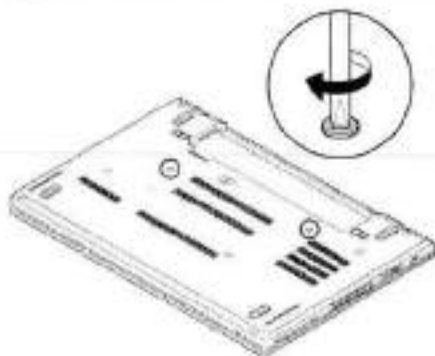
2. Insert the keyboard into the keyboard bezel as shown. Ensure that the top edge of the keyboard (the edge that is close to the computer display) is under the frame of the keyboard bezel.



3. Slide the keyboard in the direction as shown by the arrows. Ensure that the latches are secured under the keyboard frame.



4. Close the computer display and turn the computer over. Tighten the screws to secure the keyboard.



5. Reinstall the removable battery.  
6. Turn the computer over. Connect the ac power adapter and all cables to the computer.

### Replacing the coin-cell battery



Before you start, read "Important safety information" on page v and print the following instructions.

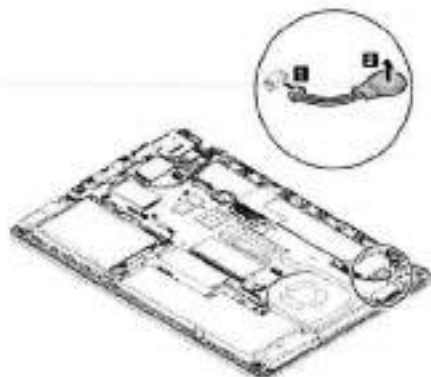


If the coin-cell battery is incorrectly replaced, there is danger of an explosion. The coin-cell battery contains a small amount of harmful substance. To avoid possible injury:

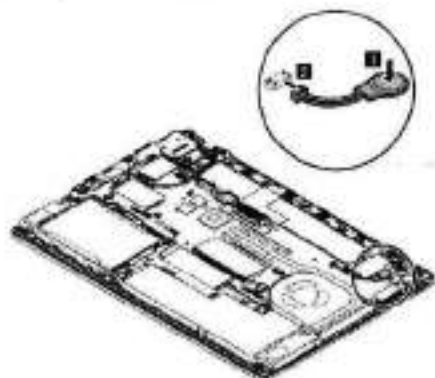
- Replace only with a battery of the type recommended by Lenovo.
- Keep the battery away from fire.
- Do not expose it to excessive heat.
- Do not expose it to water or rain.
- Do not short-circuit it.
- Do not drop, crush, puncture the battery, or make it subject to strong forces. Battery abuse or mishandling can cause the battery to overheat, which can cause gasses or flame to "vent" from the battery or coin-cell battery.

To replace the coin-cell battery, do the following:

1. Disable the built-in battery. See "Disabling the built-in battery."
2. Ensure that the computer is turned off and disconnected from ac power and all cables.
3. Close the computer display and turn the computer over.
4. Remove the removable battery. See "Replacing the removable battery" on page 98.
5. Remove the base cover assembly. See "Replacing the base cover assembly" on page 101.
6. Detach the connector  and then remove the coin-cell battery .



7. Install the new coin-cell battery  and attach the connector .



8. Reinstall the base cover assembly and the removable battery.  
9. Turn the computer over. Connect the ac power adapter and all cables to the computer.

**Attention:** After you replace the coin-cell battery, reset the system date and time in the ThinkPad Setup program. See "Date/Time menu" on page 68.



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## Chapter 10. Getting support

This chapter provides information about getting help and support from Lenovo.

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### Before you contact Lenovo

Often, you can solve your computer problems by referring to the information in the explanations of error codes, running diagnostic programs, or by consulting the Lenovo Support Web site.

#### Registering your computer

Register your computer with Lenovo. For more information, see "Registering your computer" on page 15.

#### Downloading system updates

Downloading updated software might resolve problems you experience with your computer.

To download updated software, go to the following Web site and follow the instructions on the screen:

<http://www.lenovo.com/support>

#### Recording information

Before you talk to a Lenovo representative, record the following important information about your computer.

##### Recording problem symptoms and details

Collect the answers to the following questions before you call for help. Then, you are able to get help as quickly as possible.

- What is the problem? Is it continuous or intermittent?
- Is there an error message? What is the error code, if any?
- What operating system are you using? Which version?
- Which software applications were running at the time of the problem?
- Can the problem be reproduced? If so, how?

##### Recording system information

The serial number label is on the bottom of your computer. Record the machine type and the serial number.

- What is the name of your Lenovo product?
- What is the machine type?
- What is the serial number?

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### Getting help and service

If you need help, service, technical assistance, or more information about Lenovo products, you will find a wide variety of sources available from Lenovo to assist you.

Information about your computer and preinstalled software, if any, is available in the documentation that comes with your computer or on the Lenovo Support Web site at <http://www.lenovo.com/support>. The documentation includes printed books, online books, media files, and help files.

Microsoft Service Packs are the latest software source for Windows product updates. They are available through Web download (connection charges might apply) or through discs. For more specific information and links, go to <https://www.microsoft.com>. Lenovo offers technical assistance with installation of, or questions related to, Service Packs for your Lenovo-preinstalled Microsoft Windows product. For more information, contact the Customer Support Center.

### Lenovo Support Web site

Technical support information is available on the Lenovo Support Web site at <http://www.lenovo.com/support>.

This Web site is updated with the latest support information such as the following:

- Drivers and software
- Diagnostic solutions
- Product and service warranty
- Product and parts details
- User guides and manuals
- Knowledge base and frequently asked questions

### Calling Lenovo

If you have tried to correct the problem yourself and still need help, during the warranty period, you can get help and information by telephone through the Customer Support Center. The following services are available during the warranty period:

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- Lenovo hardware repair - If the problem is determined to be caused by Lenovo hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. Lenovo or your reseller, if authorized by Lenovo, will make selected Engineering Changes (ECs) that apply to your hardware available.

The following items are not covered:

- Replacement or use of parts not manufactured for or by Lenovo or nonwarranted parts
- Identification of software problem sources
- Configuration of UEFI BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of programs

For the terms and conditions of the Lenovo Limited Warranty that apply to your Lenovo hardware product, see "Warranty information" in the Safety and Warranty Guide that comes with your computer.

If possible, be near your computer when you make your call. Ensure that you have downloaded the most current drivers and system updates, run diagnostics, and recorded information before you call. When calling for technical assistance, have the following information available:

- Machine type and model
- Serial numbers of your computer, monitor, and other components, or your proof of purchase
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information for your system

**Telephone numbers**

For a list of the Lenovo Support phone numbers for your country or region, go to <http://www.lenovo.com/support/phone> or refer to the Safety and Warranty Guide that comes with your computer.

**Note:** Phone numbers are subject to change without notice. The latest phone numbers are available at <http://www.lenovo.com/support/phone>. If the number for your country or region is not provided, contact your Lenovo reseller or Lenovo marketing representative.

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**Purchasing additional services**

During and after the warranty period, you can purchase additional services. Service availability and service name might vary by country or region.

For more information about these services, go to <http://www.lenovo.com/essentials>.

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## Appendix A. Supplemental information about the Ubuntu operating system

In limited countries or regions, Lenovo offers customers an option to order computers with the preinstalled Ubuntu® operating system.

If the Ubuntu operating system is available on your computer, read the following information before you use the computer. Ignore any information related to Windows-based programs, utilities, and Lenovo preinstalled applications in this documentation.

### Accessing the Lenovo Limited Warranty

This product is covered by the terms of the Lenovo Limited Warranty (LLW), version L505-0010-02 03/2011. You can view the LLW in a number of languages from the following Web site. Read the Lenovo Limited Warranty at:

[http://www.lenovo.com/warranty/llw\\_02](http://www.lenovo.com/warranty/llw_02)

The LLW also is preinstalled on the computer. To access the LLW, go to the following directory:

```
/usr/share/doc/lenovo-llw
```

If you cannot view the LLW either from the Web site or from your computer, contact your local Lenovo office or reseller to obtain a printed version of the LLW.

### Accessing the Ubuntu help system

The Ubuntu help system provides information about how to use the Ubuntu operating system. To access the help system from the Unity, move your pointer to the Launch bar, and then click the **Help** icon. If you cannot find the **Help** icon from the Launch bar, click the **Search** icon, and type **Help** to search it.

To learn more about the Ubuntu operating system, go to:

<https://www.ubuntu.com>

### Getting support information

If you need help, service, technical assistance, or more information about the Ubuntu operating system or other applications, contact the provider of the Ubuntu operating system or the provider of the application. If you need the service and support for hardware components shipped with your computer, contact Lenovo. For more information about how to contact Lenovo, refer to the *User Guide* and *Safety and Warranty Guide*.

To access the latest *User Guide* and *Safety and Warranty Guide*, go to:

<http://www.lenovo.com/support>

## Appendix B. Regulatory information

This chapter provides regulatory and compliance information about Lenovo products.

### Certification-related information

**Product name:** ThinkPad T480

**Compliance ID:** TP0088C

**Machine types:** 20L5 and 20L6

The latest compliance information is available at:

<http://www.lenovo.com/rotppliance>

### Wireless-related information

This topic provides wireless-related information about Lenovo products.

#### Wireless interoperability

Wireless-LAN card is designed to be interoperable with any wireless-LAN product that is based on Direct Sequence Spread Spectrum (DSSS), Complementary Code Keying (CCK), and/or Orthogonal Frequency Division Multiplexing (OFDM) radio technology, and is compliant to:

- The 802.11b/g Standard, 802.11a/b/g, 802.11n, or 802.11ac on wireless-LANs, as defined and approved by the Institute of Electrical and Electronics Engineers.
- The Wireless Fidelity (Wi-Fi) certification as defined by the Wi-Fi Alliance®.

Your Bluetooth card supports Windows 10 in-box Bluetooth profiles. Some computer models might be equipped with a Bluetooth card compliant with the Bluetooth Specification version 4.2 as defined by the Bluetooth Special Interest Group SIG. However, the Windows operating system might limit the support only on the Bluetooth Specification version 4.1.

#### Usage environment and your health

This computer contains integrated wireless cards that operate within the guidelines identified by radio frequency (RF) safety standards and recommendations; therefore, Lenovo believes that this product is safe for use by consumers. These standards and recommendations reflect the consensus of the worldwide scientific community, and result from deliberations of panels and committees of scientists, who continually review and interpret the extensive research literature.

In some situations or environments, the use of wireless devices might be restricted by the proprietor of a building or responsible representatives of an organization. For example, these situations and areas might include the following:

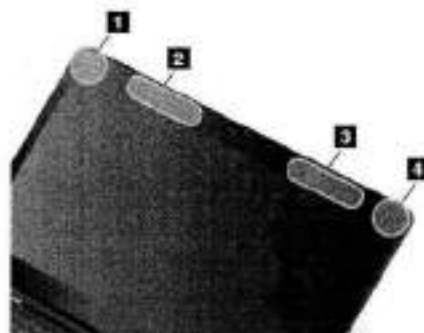
- On board of airplanes, in hospitals or near petrol stations, blasting areas (with electro-explosive devices), medical implants or body-worn electronic medical devices, such as pacemakers.
- In any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies to the use of wireless devices in a specific area (such as an airport or hospital), you are encouraged to ask for authorization to use a wireless device prior to turning on the computer.

#### Locating the UltraConnect wireless antennas

ThinkPad notebook computers feature an integrated UltraConnect™ wireless antenna system built into the display for optimal reception, enabling wireless communication wherever you are.

The following illustration shows the antenna locations of your computer:



- Wireless-LAN antenna (auxiliary)
- Wireless-WAN antenna (auxiliary, available on some models)
- Wireless-WAN antenna (main, available on some models)
- Wireless-LAN antenna (main)

#### Wireless-radio compliance information

Computer models equipped with wireless communications comply with the radio frequency and safety standards of any country or region in which it has been approved for wireless use.

##### Brazil wireless-radio compliance information

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

This equipment is a secondary type device, that is, it is not protected against harmful interference, even if the interference is caused by a device of the same type, and it also cannot cause any interference to primary type devices.

##### Mexico wireless-radio compliance information

**Advertencia:** En México la operación de este equipo está sujeta a las siguientes dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

## Locating wireless regulatory notices

For more information about the wireless regulatory notices, refer to the Regulatory Notice shipped with your computer.

If your computer is shipped without the Regulatory Notice, you can find it on the Web site at:

<http://www.lenovo.com/54992>

## TCO certification

To obtain the TCO certification information for your computer, go to:

<http://www.lenovo.com/tco-cert>

## Export classification notice

This product is subject to the United States Export Administration Regulations (EAR) and has an Export Classification Control Number (ECCN) of 5A992.d. It can be re-exported except to any of the embargoed countries in the EAR's country list.

## Electronic emission notices

### Federal Communications Commission Declaration of Conformity

The following information refers to ThinkPad T480, machine types: 20L5, 20L6.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized dealer or service representative for help.

Lenovo is not responsible for any radio or television interference caused by using other than specified or recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:  
Lenovo (United States) Incorporated  
1009 Think Place - Building One  
Morrisville, NC 27560  
Phone Number: 919-294-5900



## Industry Canada Class B emission compliance statement

CAN ICES-3(R)/NMB-3(R)

## European Union conformity

EU Contact: Lenovo, Einsteinova 21, 851 01 Bratislava, Slovakia



**EMC Directive Statement:** This product is in conformity with the protection requirements of EU Council EMC Directive 2014/30/EU on the approximation of the laws of the Member States relating to electromagnetic compatibility.

This product has been tested and found to comply with the limits for Class B equipment according to European Standards harmonized in the Directives in compliance. The Class B requirements for equipment are intended to offer adequate protection to broadcast services within residential environments.

**Radio Equipment Directive Statement:** This product is in conformity with all the requirements and essential norms that apply to EU Council Radio Equipment Directive 2014/53/EU on the approximation of the laws of the Member States relating to radio equipment. The full text of the system EU declaration of conformity and the EU wireless module declarations are available at the following Internet addresses:

- For notebook computers: <http://www.lenovo.com/eu-dcc-notebooks>
- For tablets: <http://www.lenovo.com/eu-dcc-tablets>

Lenovo cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the installation of option cards from other manufacturers. This product has been tested and found to comply with the limits for Class B equipment according to European Standards harmonized in the Directives in compliance. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication devices.

## German Class B compliance statement

### Deutschsprachiger EU Hinweis:

#### Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der Klasse B der Norm gemäß Richtlinie.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der Lenovo empfohlene Kabel angeschlossen werden. Lenovo übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der Lenovo verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der Lenovo gesteckt/eingebaut werden.

## Deutschland:

### Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Betriebsmitteln

Dieses Produkt entspricht dem „Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln“ EMVG (früher „Gesetz über die elektromagnetische Verträglichkeit von Geräten“). Dies ist die Umsetzung der EMV EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Betriebsmitteln, EMVG vom 20. Juli 2007 (früher Gesetz über die elektromagnetische Verträglichkeit von Geräten), bzw. der EMV EU Richtlinie 2014/30/EU, für Geräte der Klasse B.

Dieses Gerät ist berechtigt in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen – CE – zu führen. Verantwortlich für die Konformitätserklärung nach Paragraf 5 des EMVG ist die Lenovo (Deutschland) GmbH, Metzerstr. 9, D-70563 Stuttgart.

Informationen in Hinsicht EMVG Paragraf 4 Abs. (1)-4:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55032 Klasse B.

## Japan VCCI Class B compliance statement

この製品は、VCCI規格に適合する。この製品は電磁気的妨害を受ける製品ではない。  
この製品は、VCCI規格に適合する。この製品は電磁気的妨害を受ける製品ではない。  
この製品は、VCCI規格に適合する。この製品は電磁気的妨害を受ける製品ではない。

Page 8

## Japan compliance statement for products which connect to the power mains with rated current less than or equal to 20 A per phase

日本電気規格 JIS C 8106-3-2 適合品  
高周波電磁妨害 JIS C 8106-3-2 適合品

## Japan notice for ac power cord

The ac power cord shipped with your product can be used only for this specific product. Do not use the ac power cord for other devices.

本製品およびアプリケーションに電源コード・セットが付属する場合、  
それぞれ専用のものになっていますので他の電気機器には使用し  
ないでください。

## Lenovo product service information for Taiwan

總代理 鴻海精密工業股份有限公司  
總代理 鴻海精密工業股份有限公司  
總代理 鴻海精密工業股份有限公司

## Eurasian compliance mark



## Brazil audio notice

Ouvir sons com mais de 85 decibéis por longos períodos pode prejudicar danos ao sistema auditivo.

---

## Appendix C. WEEE and recycling statements

The chapter provides environmental information about Lenovo products.

---

### General recycling information

Lenovo encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. Lenovo offers a variety of programs and services to assist equipment owners in recycling their IT products. For information about recycling Lenovo products, go to:

<http://www.lenovo.com/recycling>

The latest environmental information about our products is available at:

<http://www.lenovo.com/ecodesign/lenovo>

---

### Important WEEE information



The WEEE marking on Lenovo products applies to countries with WEEE and e-waste regulations (for example, the European WEEE Directive, India E-Waste Management Rules). Appliances are labeled in accordance with local regulations concerning waste electrical and electronic equipment (WEEE). These regulations determine the framework for the return and recycling of used appliances as applicable within each geography. This label is applied to various products to indicate that the product is not to be thrown away, but rather put in the established collection systems for reclaiming these end-of-life products.

Users of electrical and electronic equipment (EEE) with the WEEE marking must not dispose of end-of-life EEE as unsorted municipal waste, but use the collection framework available to them for the return, recycle, and recovery of WEEE and to minimize any potential effects of EEE on the environment and human health due to the presence of hazardous substances. Lenovo electrical and electronic equipment (EEE) may contain parts and components, which at end-of-life might qualify as hazardous waste.

EEE and waste electrical and electronic equipment (WEEE) can be delivered free of charge to the place of sale or any distributor that sells electrical and electronic equipment of the same nature and function as the used EEE or WEEE.

For additional WEEE information, go to:

<http://www.lenovo.com/recycling>

#### WEEE information for Hungary

Lenovo, as a producer, bears the cost incurred in connection with the fulfillment of Lenovo's obligations under Hungary Law No. 197/2014 (VII.1.) subsections (1)-(3) of section 12.

---

## Japan recycling statements

### Collecting and recycling a disused Lenovo computer or monitor

If you are a company employee and need to dispose of a Lenovo computer or monitor that is the property of the company, you must do so in accordance with the Law for Promotion of Effective Utilization of Resources. Computers and monitors are categorized as industrial waste and should be properly disposed of by an industrial waste disposal contractor certified by a local government. In accordance with the Law for Promotion of Effective Utilization of Resources, Lenovo Japan provides, through its PC Collecting and Recycling Services, for the collecting, reuse, and recycling of disused computers and monitors. For details, visit the Lenovo Web site at:

<http://www.lenovo.com/recycling/japan>

Pursuant to the Law for Promotion of Effective Utilization of Resources, the collecting and recycling of home-used computers and monitors by the manufacturer was begun on October 1, 2003. This service is provided free of charge for home-used computers sold after October 1, 2003. For details, go to:

<http://www.lenovo.com/recycling/japan>

### Disposing of Lenovo computer components

Some Lenovo computer products sold in Japan may have components that contain heavy metals or other environmental sensitive substances. To properly dispose of disused components, such as a printed circuit board or drive, use the methods described above for collecting and recycling a disused computer or monitor.

### Disposing of disused lithium batteries from Lenovo computers

A button-shaped lithium battery is installed inside your Lenovo computer to provide power to the computer clock while the computer is off or disconnected from the main power source. If you need to replace it with a new one, contact your place of purchase or contact Lenovo for service. If you need to dispose of a disused lithium battery, insulate it with vinyl tape, contact your place of purchase or an industrial-waste-disposal operator, and follow their instructions.

Disposal of a lithium battery must comply with local ordinances and regulations.

### Disposing of a disused battery from Lenovo notebook computers

Your Lenovo notebook computer has a lithium ion battery or a nickel metal hydride battery. If you are a company employee who uses a Lenovo notebook computer and need to dispose of a battery, contact the proper person in Lenovo sales, service, or marketing, and follow that person's instructions. You also can refer to the instructions at:

<https://www.lenovo.com/ja/environment/recycle/battery/>

If you use a Lenovo notebook computer at home and need to dispose of a battery, you must comply with local ordinances and regulations. You also can refer to the instructions at:

<https://www.lenovo.com/ja/environment/recycle/battery/>

## Recycling information for Brazil

### Declarações de Reciclagem no Brasil

#### Descarte de um Produto Lenovo Fora de Uso

Equipamentos eletrônicos e eletrônicos não devem ser descartados em lixo comum, mas enviados à pontos de coleta, autorizados pelo fabricante do produto para que sejam encaminhados e processados por empresas especializadas no manuseio de resíduos industriais, devidamente certificadas pelos órgãos ambientais, de acordo com a legislação local.

A Lenovo possui um canal específico para auxiliá-lo no descarte desses produtos. Caso você possua um produto Lenovo em situação de descarte, ligue para o nosso SAC ou encaminhe um e-mail para: [reciclar@lenovo.com](mailto:reciclar@lenovo.com), informando o modelo, número de série e cidade, a fim de enviarmos as instruções para o correto descarte do seu produto Lenovo.

## Battery recycling information for the European Union

EU



**Notes:** This mark applies only to countries within the European Union (EU).

Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

In accordance with the European Directive 2006/66/EC, batteries and accumulators are labeled to indicate that they are to be collected separately and recycled at end of life. The label on the battery may also include a chemical symbol for the metal concerned in the battery (Pb for lead, Hg for mercury, and Cd for cadmium). Users of batteries and accumulators must not dispose of batteries and accumulators as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and treatment of batteries and accumulators. Customer participation is important to minimize any potential effects of batteries and accumulators on the environment and human health due to the potential presence of hazardous substances.

Before placing electrical and electronic equipment (EEE) in the waste collection stream or in waste collection facilities, the end user of equipment containing batteries and/or accumulators must remove those batteries and accumulators for separate collection.

#### Disposing of lithium batteries and battery packs from Lenovo products

A coin-cell type lithium battery might be installed inside your Lenovo product. You can find details about the battery in the product documentation. If the battery needs to be replaced, contact your place of purchase or

contact Lenovo for service. If you need to dispose of a lithium battery, insulate it with vinyl tape, contact your place of purchase or a waste-disposal operator, and follow their instructions.

#### Disposing of battery packs from Lenovo products

Your Lenovo device might contain a lithium-ion battery pack or a nickel metal hydride battery pack. You can find details on the battery pack in the product documentation. If you need to dispose of a battery pack, insulate it with vinyl tape, contact Lenovo sales, service, or your place of purchase, or a waste-disposal operator, and follow their instructions. You also can refer to the instructions provided in the user guide for your product.

For proper collection and treatment, go to:

<http://www.lenovo.com/lenovoclearenvironment>

## Battery recycling information for Taiwan



廢電池請回收

## Battery recycling information for the United States and Canada



US & Canada Only

## Recycling information for China

《废弃电器电子产品回收处理管理条例》提示性说明

联想品牌拥有联想品牌产品的用户当不再需要此类产品时，遵守国家废弃电器电子产品回收处理相关法律法规，请将其交给当地具有国家认可的回收处理资质的厂商进行回收处理。更多回收服务信息，请点击进入<http://support.lenovo.com/cn/recycling/33>。



## Appendix D. Restriction of Hazardous Substances (RoHS) Directive

The latest environmental information about Lenovo products is available at:

<http://www.lenovo.com/ecodeclaration>

### European Union RoHS

This Lenovo product, with included parts (cables, cords, and so on) meets the requirements of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment ("RoHS recast" or "RoHS 2").

For more information about Lenovo worldwide compliance on RoHS, go to:

<http://www.lenovo.com/rohs-communication>

### Turkish RoHS

The Lenovo product meets the requirements of the Republic of Turkey Directive on the Restriction of the Use of Certain Hazardous Substances in Waste Electrical and Electronic Equipment (WEEE).

### Türkiye AEEE Yönetmeliğine Uygunluk Beyanı

Bu Lenovo ürünü, T.C. Çevre ve Orman Bakanlığı'nın "Atık Elektrik ve Elektronik Eşyalarla Bazı Zararlı Maddelerin Kullanımının Sınırlanmasına Dair Yönetmelik (AEEE)" ile düzenlenmiştir.

AEEE Yönetmeliğine Uygundur.

### Ukraine RoHS

Ця інформація свідчить, що продукція Lenovo відповідає вимогам нормативних актів України, які обмежують вміст небезпечних речовин.

### India RoHS

RoHS compliant as per E-Waste (Management) Rules.

### China RoHS

The information in the following table is applicable for products manufactured on or after January 1, 2015 for sale in the People's Republic of China.

产品中有害物质的名称及含量

部件名称	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板组件	X	0	0	0	0	0
硬盘	X	0	0	0	0	0
光驱	X	0	0	0	0	0
LCD 面板 (LED 背光源)	X	0	0	0	0	0
键盘	X	0	0	0	0	0
内存	X	0	0	0	0	0
电池	X	0	0	0	0	0
电源适配器	X	0	0	0	0	0
底座、顶盖和扬声器	X	0	0	0	0	0

注：  
本表依据 SJ/T 11364 的规定编制。  
0：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。  
X：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 标准规定的限量要求。标有“X”的部件，皆因全球技术发展水平限制而无法实现有害物质的替代，印刷电路板组件包括印刷电路板（PCB）及其组件、集成电路（IC）和连接器。某些型号的产品可能不包含上表中的某些部件，请以实际购买机型为准。

图示：



在中华人民共和国境内销售的电子信息产品上将印有“环保使用期限”（EUP）符号。圆圈中的数字代表产品的正常环保使用期限。

## Taiwan RoHS

單元 Unit	限制物質及其化學符號 Restricted substances and its chemical symbols					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr <sup>6+</sup> )	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷電路 板組件	-	○	○	○	○	○
硬碟機	-	○	○	○	○	○
光碟機	-	○	○	○	○	○
LCD面板 (LED背 光源)	-	○	○	○	○	○
鍵盤	-	○	○	○	○	○
記憶體	-	○	○	○	○	○
電源供應器	-	○	○	○	○	○
底座、頂蓋 和喇叭	-	○	○	○	○	○

備考1. "超出0.1 wt%"及"超出0.01 wt%"係指限制物質之百分比含量超出百分比含量基準值。

Note 1: "Exceeding 0.1 wt%" and "exceeding 0.01 wt%" indicate that the percentage content of the restricted substance exceeds the reference percentage value of percentage content.

備考2. "○"係指該項限制物質之百分比含量未超出百分比含量基準值。

Note 2: "○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of percentage.

備考3. "-"係指該項限制物質為排除項目。

Note 3: "-" indicates that the restricted substance corresponds to the exemption.

## Appendix E. ENERGY STAR model information



ENERGY STAR® is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy aimed at saving money and protecting the environment through energy efficient products and practices.

Lenovo is proud to offer our customers products with the ENERGY STAR qualified designation. You might find an ENERGY STAR mark affixed on the computer or displayed on the power settings interface. Lenovo computers of the following machine types, if carry an ENERGY STAR mark, have been designed and tested to conform to the ENERGY STAR program requirements for computers.

### 20L5 and 20L6

By using ENERGY STAR qualified products and taking advantage of the power-management features of the computer, you can help reduce the consumption of electricity. Reduced electrical consumption can contribute to potential financial savings, a cleaner environment, and the reduction of greenhouse gas emissions.

For more information about ENERGY STAR, go to:

<http://www.energystar.gov>

Lenovo encourages you to make efficient use of energy an integral part of your day-to-day operations. To help in this endeavor, Lenovo has preset the following power-management features to take effect when the computer has been inactive for a specified length of time:

**Power plan:** Default (when plugged into ac power)

- Turn off the display: After 10 minutes
- Put the computer to sleep: After 30 minutes

To awaken the computer from sleep mode, press the Fn key on your keyboard. For more information about these settings, see the Windows help information on the computer.

The Wake on LAN function is enabled when your Lenovo computer is shipped from the factory, and the setting remains valid even when the computer is in sleep mode. If you do not need to have Wake on LAN enabled while the computer is in sleep mode, you can reduce the power consumption and prolong the time in sleep mode, by disabling the setting of Wake on LAN for sleep mode.

To disable the setting of Wake on LAN for sleep mode, do the following:

1. Go to Control Panel and click **Hardware and Sound** → **Device Manager**.
2. In the Device Manager window, expand **Network adapters**.
3. Right-click your network adapter device, and click **Properties**.

4. Click the **Power Management** tab.
5. Clear the **Allow this device to wake the computer** check box.
6. Click **OK**.

---

## Appendix F. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

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1000 Think Place - Building One  
Morrisville, NC 27560  
U.S.A.  
Attention: Lenovo Director of Licensing

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Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document is copyrighted by Lenovo and is not covered by any open source license, including any Linux agreement(s) which may accompany software included with this product. Lenovo may update this document at any time without notice.

To obtain the most up-to-date documentation for your computer, go to:

<http://www.lenovo.com/support>

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## Appendix G. Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

- Access Connections
- Lenovo
- Lenovo logo
- ThinkPad
- ThinkPad logo
- TrackPoint
- UltraConnect

Intel, Intel SpeedStep, Optano, and Thunderbolt are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

Microsoft, Windows, Direct3D, BitLocker, and Cortana are trademarks of the Microsoft group of companies.

DisplayPort are trademarks of the Video Electronics Standards Association.

Ubuntu is a registered trademark of Canonical Ltd.

The terms HDMI and HDMI High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

Wi-Fi, Wi-Fi Alliance, and Miracast are registered trademarks of Wi-Fi Alliance.

NVIDIA is a registered trademark of NVIDIA Corporation.

USB-C is a trademark of USB Implementers Forum.

Other company, product, and service names may be trademarks or service marks of others.

Lenovo



REPUBLICA FEDERATIVA DO BRASIL

ESTADO DE SÃO PAULO 8100-0

SECRETARIA DA SEGURANÇA PÚBLICA  
INSTITUTO DE IDENTIFICAÇÃO RICARDO SAMBLETOM VALINI

PROIBIDO PLASTIFICAR

0574-64381

CARTERA DE IDENTIDADE

*[Signature]*

05 SET 2011

VÁLIDA EM TODO O TERRITÓRIO NACIONAL

REGISTRO GERAL 15.548.716-4 DATA DE EXPIRAÇÃO 04/JAN/2011

NOME CHRISTIAN MAUAD GEBARA

FILIAÇÃO HUBERT GEBARA  
E VIVIAN MARIA MAUAD GEBARA

NACIONALIDADE S. PAULO -SP DATA DE NASCIMENTO 29/SET/1972

END. CIVIL SÃO PAULO-SP  
CERQUEIRA CESAR  
CC: LV. 8039/PLS. 0201/N. 011523  
CPF 203838628/50 PIS 12525344229

111 Delegado Divisão de Polícia IIRCO/SSP/SP

LE Nº 7.116 DE 2009/93

REPÚBLICA FEDERATIVA DO BRASIL

**RIO GRANDE DO SUL**  
SECRETARIA DA SEGURANÇA PÚBLICA  
INSTITUTO GERAL DE RECURSOS  
DEPARTAMENTO DE IDENTIFICAÇÃO



Fingerprint Digital



*BPPPO*  
SIGNATURA DO TITULAR

CARTEIRA DE IDENTIDADE

VALIDA EM TODO O TERRITÓRIO NACIONAL

REGISTRO: 1053328066 DATA DE EMISSÃO: 26/04/2012

**BRENO RODRIGO PACHECO DE OLIVEIRA**

FILIAÇÃO: ELOY SILVA DE OLIVEIRA  
MORDEMA REGINA F DE OLIVEIRA

NATURALIDADE: SÃO LEOPOLDO RS DATA DE NASCIMENTO: 20/07/1975

PROF. CATEGORIA: C GAS MONTENEGRO RS  
MATRÍCULA: 087188 61 55 1998 2 00014 704 000975 31

CPF: 711.936.930-04

PROFESSOR ALICENCIADO Nº: 711936930-04

LEI Nº 7.116 DE 29/08/81

NOTAS - S. PAULO  
5 SET 2019



Este documento é o comprovante de inscrição no CADASTRO DE PESSOAS FÍSICAS - CPF, válido e exigível em qualquer lugar, salvo nos casos previstos na legislação vigente.

Assinatura: *BPPPO*  
BRENO RODRIGO PACHECO DE OLIVEIRA

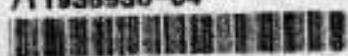
VÁLIDO EM TODO O TERRITÓRIO NACIONAL  
Emissão em: 09/01/94

MINISTÉRIO DA FAZENDA  
Secretaria de Receita Federal

**CPF - CADASTRO DE PESSOAS FÍSICAS**

Nome: BRENO RODRIGO PACHECO DE OLIVEIRA

Nº de Inscrição: 711936930-04 Data de Nascimento: 20/07/75



NOTAS - S. PAULO  
5 SET 2019





PROTOCOLO  
 SERVIÇO PÚBLICO FEDERAL  
 POLÍCIA FEDERAL  
 DIREX-COORDENAÇÃO-GERAL DE POLÍCIA DE IMIGRAÇÃO

NOME DAVID		SOBRENOME MELCON SANCHEZ FRIERA	
SEXO MASCULINO	DATA DE NASCIMENTO 05/08/1970	RNM G2407375	
CLASSIFICAÇÃO RESIDENTE	AMPARO 188 - RN 11 OU 12/2017 - CNIG	PAIS DE NACIONALIDADE ESPAÑA	
FILIAÇÃO 1 MARIA DEL CARMEN SANCHEZ FRIERA GONZALEZ - FEMININO		FILIAÇÃO 2 ELEUTERIO RICARDO MELCON LOPEZ - MASCULINO	
	Tipo de Requerimento Registro	Nº Requerimento 201903141721577993	Data/hora da emissão 20/03/2019 - 08:32:02
		Validade 16/09/2019	
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DUCEAP

Telefônica 0 12 18

**TELEFÔNICA BRASIL S.A.**

Companhia Aberta

CNPJ/MF n.º 02.558.157/0001-62

NIRE 35.3.0015881-4

**ATA DA 50ª ASSEMBLEIA GERAL EXTRAORDINÁRIA DA  
TELEFÔNICA BRASIL S.A. REALIZADA EM 30 DE NOVEMBRO DE 2018**

**Anexo III**

**ESTATUTO SOCIAL CONSOLIDADO DA  
TELEFÔNICA BRASIL S.A.**

**CAPITULO I - DAS CARACTERÍSTICAS DA SOCIEDADE**

**REGIME JURÍDICO**

Art. 1 – *Telefônica Brasil S.A.* é uma sociedade anônima, regida pelo presente Estatuto Social e demais dispositivos legais aplicáveis, com prazo de duração indeterminado.

**OBJETO SOCIAL**

Art. 2 - A Sociedade tem por objeto:

- a) a exploração de serviços de telecomunicações;
- b) o desenvolvimento das atividades necessárias ou úteis à execução desses serviços, na conformidade das concessões, autorizações e permissões que lhe forem outorgadas;
- c) a exploração de serviços de valor adicionado, incluindo, disponibilização sem cessão definitiva, de conteúdo de áudio, vídeo, imagem e texto, aplicativos e congêneres;
- d) a exploração de soluções integradas, gestão e prestação de serviços relacionados a: (i) *data center*, incluindo hospedagem e *colocation*; (ii) armazenamento, processamento e gerenciamento de dados, informações, textos, imagens, vídeos, aplicativos e sistemas de informações e congêneres; (iii) tecnologia da informação; (iv) segurança da informação e da comunicação; (v) telecomunicações; e (vi) sistemas de segurança eletrônica relacionados a roubo, intrusão, incêndio e outros;
- e) Licenciamento e sublicenciamento de softwares de qualquer natureza;



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Parágrafo Único - Na consecução do seu objeto, a Sociedade poderá incorporar ao seu patrimônio bens e direitos de terceiros, bem como:

I - participar do capital de outras empresas, inclusive visando ao cumprimento da política nacional de telecomunicações;

II - constituir empresas e/ou subsidiárias para a execução de atividades compreendidas no seu objeto e que se recomende sejam descentralizadas;

III - promover a importação de bens e serviços necessários à execução de atividades compreendidas no seu objeto;

IV - prestar serviços de assistência técnica às empresas do setor de telecomunicações, executando atividades de interesse comum;

V - gerir e prestar serviços de manutenção, assistência e suporte técnico em informática e em equipamentos relacionados às atividades da Sociedade;

VI - prestar serviços de consultoria relacionadas às atividades da Sociedade;

VII - elaborar, implantar e instalar projetos relacionados às atividades da Sociedade;

VIII - gerir e prestar serviços de engenharia e executar obras de construção civil e correlatas, necessárias para a execução de projetos relacionados às atividades da Sociedade;

IX - prestar serviços de monitoramento relacionados às atividades da Sociedade;

X - prestar serviço de intermediação de negócios em geral;



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XI – comercializar e locar equipamentos e materiais necessários ou úteis à exploração de suas atividades, incluindo equipamentos de precisão, medição e sensores eletrônicos;

XII - efetuar atividades de estudos e pesquisas, visando ao desenvolvimento do setor de telecomunicações;

XIII - celebrar contratos e convênios com outras empresas exploradoras de serviços de telecomunicações ou quaisquer pessoas ou entidades, objetivando assegurar a operação dos serviços, sem prejuízo das atribuições e responsabilidades; e

XIV - exercer outras atividades afins ou correlatas que lhe forem atribuídas pela Agência Nacional de Telecomunicações – ANATEL.

**SEDE**

Art. 3 - A Sociedade tem sede na Capital do Estado de São Paulo, podendo criar e extinguir, por decisão da Diretoria, filiais, agências e sucursais, escritórios, departamentos e representações, em qualquer ponto do território nacional, conforme disposto no artigo 22, (vii) deste Estatuto Social.

**CAPÍTULO II - DO CAPITAL**

**CAPITAL AUTORIZADO**

Art. 4 - A Sociedade está autorizada a aumentar seu capital social até o limite de 1.850.000.000 (um bilhão, oitocentos e cinquenta milhões) de ações, ordinárias ou preferenciais, sendo o Conselho de Administração o órgão competente para deliberar sobre o aumento e a consequente emissão de novas ações, dentro do limite do capital autorizado.



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Parágrafo 1º - Não há obrigatoriedade, nos aumentos de capital, de se guardar proporção entre o número de ações de cada espécie, observando-se, entretanto, que o número de ações preferenciais, sem direito a voto ou com voto restrito, não poderá ultrapassar 2/3 das ações emitidas.

Parágrafo 2º - Os acionistas terão direito de preferência para subscrição de aumento de capital, na proporção do número de ações que possuírem. Por deliberação do Conselho de Administração, poderá ser excluído o direito de preferência nas emissões de ações, debêntures conversíveis em ações e bônus de subscrição, cuja colocação seja feita mediante venda em Bolsa de Valores ou subscrição pública, permuta por ações em oferta pública de aquisição de controle, nos termos dos artigos 257 e 263 da Lei das S.A., bem como, gozo de incentivos fiscais, nos termos de legislação especial, conforme faculta o artigo 172 da Lei 6.404/76.

**CAPITAL SUBSCRITO**

Art. 5 - O capital social subscrito, totalmente integralizado, é de R\$ 63.571.415.865,09 (sessenta e três bilhões, quinhentos e setenta e um milhões, quatrocentos e quinze mil, oitocentos e sessenta e cinco reais e nove centavos), dividido em 1.690.984.923 (um bilhão, seiscentos e noventa milhões, novecentas e oitenta e quatro mil, novecentas e vinte e três) ações, sendo 571.644.217 (quinhentos e setenta e um milhões, seiscentos e quarenta e quatro mil, duzentas e dezessete) ações ordinárias e 1.119.340.706 (um bilhão, cento e dezenove milhões, trezentos e quarenta mil, setecentas e seis) ações preferenciais, todas escriturais, sem valor nominal.

Parágrafo Único - As ações serão mantidas em conta de depósito em instituição financeira em nome de seus titulares, sem emissão de certificados.



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**CAPÍTULO III - DAS AÇÕES**

**AÇÕES ORDINÁRIAS**

Art. 6 - A cada ação ordinária corresponde um voto nas deliberações das Assembleias Gerais de Acionistas.

**AÇÕES PREFERENCIAIS**

Art. 7 - As ações preferenciais não têm direito a voto, exceto nas hipóteses previstas nos artigos 9 e 10 abaixo, sendo a elas assegurada prioridade no reembolso de capital, sem prêmio, e recebimento de dividendo 10% (dez por cento) maior do que o atribuído a cada ação ordinária.

Parágrafo Único – Será concedido às ações preferenciais direito de voto pleno, caso a Sociedade deixe de pagar os dividendos mínimos a que fazem jus, por 3 (três) exercícios sociais consecutivos, direito que conservarão até o seu pagamento.

**CAPÍTULO IV – DA ASSEMBLEIA GERAL**

Art. 8 - As Assembleias Gerais de Acionistas realizar-se-ão: (i) ordinariamente, uma vez por ano, nos 4 (quatro) primeiros meses seguintes ao encerramento de cada exercício social, nos termos do art. 132 da Lei 6.404/76 e, (ii) extraordinariamente, sempre que necessário, seja em função dos interesses sociais, ou de disposição deste Estatuto Social, ou quando a legislação aplicável assim o exigir.

Parágrafo Único - As Assembleias Gerais de Acionistas serão convocadas pelo Conselho de Administração, cabendo ao Presidente do referido órgão consubstanciar o aludido ato.

Art. 9 - Deverá ser submetida à aprovação prévia da Assembleia Geral de Acionistas (i) a celebração de contratos com partes relacionadas, cujos termos e condições sejam



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mais onerosos para a Companhia do que os normalmente adotados pelo mercado em contratações da mesma natureza, observado, em qualquer caso, o disposto no artigo 117 da Lei 6.404/76; e (ii) a celebração de contratos de prestação de serviços de gerência, inclusive de assistência técnica, com entidades estrangeiras vinculadas ao acionista controlador da Sociedade, casos em que os titulares de ações preferenciais terão direito a voto.

Parágrafo Único: Além das matérias referidas no "caput" deste artigo, as ações preferenciais terão direito de voto (i) para a eleição de 1 (um) membro do Conselho de Administração, em votação em separado, e (ii) nas deliberações relacionadas à alteração estatutária visando suprimir o direito de eleição, em votação em separado, pelos acionistas detentores de ações preferenciais, de um membro do Conselho de Administração.

Art. 10 - Sem prejuízo do disposto no § 1º do art. 115 da Lei nº 6.404/76, os titulares de ações preferenciais terão direito a voto nas deliberações assembleares referidas no art. 9, assim como naquelas referentes à alteração ou revogação dos seguintes dispositivos estatutários:

(i) art. 9;

(ii) parágrafo único do art.11; e

(iii) art. 30.

Art. 11 - As Assembleias Gerais de Acionistas serão presididas pelo Presidente do Conselho de Administração, que deverá indicar, dentre os presentes, o Secretário. Em caso de ausência do Presidente do Conselho de Administração, os acionistas escolherão o presidente e o secretário da mesa.

Parágrafo Único - Nas hipóteses do art. 136 da Lei nº 6.404/76, a primeira convocação da Assembleia Geral de Acionistas será feita com 30 (trinta) dias de antecedência mínima, e com antecedência mínima de 10 (dez) dias, em segunda convocação.





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Art. 12 - Somente poderão tomar parte e votar na Assembleia Geral os acionistas cujas ações estejam registradas em seu nome, no livro próprio, até 72 (setenta e duas) horas antes da data designada para a respectiva Assembleia.

Parágrafo 1º - O edital de convocação poderá condicionar a presença do acionista, na Assembleia, ao depósito, na sede da Sociedade, do comprovante de sua qualidade de acionista, expedido pela própria Sociedade ou pela instituição depositária das ações da Sociedade, com até 72 (setenta e duas) horas de antecedência da data marcada para a realização da Assembleia Geral de Acionistas.

Parágrafo 2º - O edital de convocação também poderá condicionar a representação do acionista por procurador, em Assembleia, ao depósito do respectivo instrumento de mandato na sede da Sociedade, com até 72 (setenta e duas) horas de antecedência da data marcada para a realização da Assembleia Geral de Acionistas.

**CAPÍTULO V - DA ADMINISTRAÇÃO DA SOCIEDADE**

Art. 13 - A Administração da Sociedade compete ao Conselho de Administração e à Diretoria, com as atribuições conferidas por lei e pelo presente Estatuto Social. Os seus membros serão eleitos para um mandato de 3 (três) anos, sendo permitida a reeleição, estando eles dispensados de oferecer garantia para o exercício de suas funções.

Parágrafo 1º - Todos os membros do Conselho de Administração e da Diretoria tomarão posse mediante assinatura dos correspondentes termos, permanecendo nos respectivos cargos até a efetiva posse dos seus sucessores.

Parágrafo 2º - A Assembleia Geral de Acionistas deverá fixar a remuneração global dos administradores da Sociedade, incluindo os benefícios de qualquer natureza e as verbas de representação, sendo o Conselho de Administração competente para distribuir essa remuneração entre os seus membros e os da Diretoria.





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Parágrafo 1º - No caso de impedimento ou ausência de qualquer outro membro do Conselho de Administração, o Conselheiro impedido ou ausente deverá indicar, por escrito, seu substituto, dentre os demais membros do Conselho de Administração, para representá-lo e deliberar na reunião à qual não puder estar presente, nos termos do disposto no parágrafo 3º do artigo 19 deste Estatuto.

Parágrafo 2º - Os membros do Conselho de Administração que indicarem representantes, conforme disposto no parágrafo anterior, serão considerados, para todos os efeitos, presentes à respectiva reunião.

Art. 16 - Ocorrendo vacância nos cargos de membros do Conselho de Administração, restando número inferior ao mínimo de membros previsto no art. 14 supra, deverá ser convocada Assembleia Geral de Acionistas para eleição de substitutos.

**COMPETÊNCIA**

Art. 17 - Compete ao Conselho de Administração:

- (i) - fixar a orientação geral dos negócios da Sociedade;
- (ii) - aprovar o orçamento e o plano anual de negócios da Sociedade;
- (iii) - convocar a Assembleia Geral de Acionistas;
- (iv) - aprovar as demonstrações financeiras e o relatório da administração da Sociedade e submetê-los à Assembleia Geral de Acionistas;
- (v) - eleger ou destituir, a qualquer tempo, os membros da Diretoria, fixando-lhes as atribuições, observadas as disposições legais e estatutárias;



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(vi) – aprovar a criação de Comitês técnicos e consultivos para seu assessoramento em assuntos de interesse da Sociedade, eleger os membros de tais Comitês e aprovar seus regulamentos internos, que conterão as regras específicas relativas a composição, funções, competência, remuneração e funcionamento;

(vii) - fiscalizar a gestão dos Diretores da Sociedade, examinar, a qualquer tempo, os livros da Sociedade, solicitar informações sobre os contratos celebrados ou em via de celebração, ou quaisquer outros atos;

(viii) - aprovar a estrutura organizacional da Sociedade, podendo atribuir limites à Diretoria para o exercício de tal competência, observadas as disposições legais e estatutárias;

(ix) - aprovar e alterar o regimento interno do Conselho de Administração;

(x) - deliberar sobre emissão de ações pela Sociedade, com aumento de capital, dentro do limite do capital autorizado, definindo os termos e as condições dessa emissão;

(xi) - deliberar sobre a emissão de bônus de subscrição;

(xii) - deliberar, por delegação da Assembleia Geral de Acionistas, acerca dos seguintes aspectos nas emissões de debêntures pela Sociedade: (i) oportunidade da emissão, (ii) época e condições de vencimento, amortização ou resgate, (iii) época e condições do pagamento dos juros, da participação nos lucros e do prêmio de reembolso, se houver, (iv) modo de subscrição ou colocação e, (v) tipo das debêntures;

(xiii) - deliberar sobre a emissão de debêntures simples, não conversíveis em ações e sem garantia real;

(xiv) - deliberar sobre a emissão de notas promissórias para distribuição pública ("Commercial Papers") e sobre a submissão das ações da Sociedade a regime de depósito para comercialização dos respectivos certificados ("Depositary Receipts");



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- (xv) - autorizar a aquisição de ações de emissão da Sociedade, para cancelamento ou permanência em tesouraria e posterior alienação;
- (xvi) - autorizar a alienação dos bens vinculados diretamente aos serviços públicos de telecomunicações em serviço;
- (xvii) - autorizar a alienação de bens imóveis, constituição de ônus reais e a prestação de garantias a obrigações de terceiros, podendo fixar limites para a prática de tais atos pela Diretoria;
- (xviii) - estabelecer, em norma interna, os limites para que a Diretoria autorize a alienação ou oneração de bens do ativo permanente, inclusive aqueles relacionados aos serviços públicos de telecomunicações que se encontrarem desativados ou inservíveis;
- (xix) aprovar a participação da Sociedade em consórcios em geral, bem como os termos de tal participação, podendo delegar tal atribuição à Diretoria, nos limites que estabelecer, sempre visando ao desenvolvimento das atividades do objeto social da Sociedade;
- (xx) - fixar os limites para que a Diretoria autorize a prática de atos gratuitos razoáveis em benefício dos empregados ou da comunidade de que participe a Sociedade, inclusive a doação de bens inservíveis para a Sociedade;
- (xxi) - aprovar a criação e a extinção de subsidiárias da Sociedade, no país ou no exterior;
- (xxii) - aprovar a assunção de qualquer obrigação, não prevista no orçamento da Sociedade, em valor superior a R\$250.000.000,00 (duzentos e cinquenta milhões de reais);



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- (xxiii) - autorizar a celebração de contratos, não previstos no orçamento da Sociedade, em valor superior a R\$250.000.000,00 (duzentos e cinquenta milhões de reais);
- (xxiv) - aprovar a realização de investimentos e a aquisição de ativos, não previstos no orçamento, em valor superior a R\$250.000.000,00 (duzentos e cinquenta milhões de reais);
- (xxv) - autorizar a aquisição de participação acionária em caráter permanente em outras sociedades e a oneração ou a alienação de participação acionária;
- (xxvi) - aprovar a distribuição de dividendos intermediários;
- (xxvii) - escolher ou destituir os auditores independentes;
- (xxviii) - indicar e destituir o titular da auditoria interna, que se reportará ao Conselho de Administração, por intermédio do Comitê de Auditoria e Controle, quando em funcionamento, bem como o titular da Diretoria de Atacado, responsável este, exclusivamente, por todos os processos de atendimento, comercialização e entrega dos produtos referentes às Ofertas de Referência dos Produtos no Mercado de Atacado; e
- (xxix) - aprovar o plano de cargos e salários, políticas de incentivos e desenvolvimento profissional, o regulamento e os quadros de pessoal da Sociedade, bem como os termos e condições de acordos coletivos de trabalho a serem firmados com os sindicatos representativos das categorias dos empregados da Sociedade e a adesão ou desligamento de fundos complementares de aposentadoria, tudo com relação aos empregados da Companhia, podendo o Conselho de Administração, quando entender necessário, atribuir à Diretoria limites para deliberar sobre essas matérias.
- Art. 18 - As atribuições específicas do Presidente do Conselho de Administração são:
- (a) representar o Conselho na convocação da Assembleia Geral de Acionistas; (b) presidir a Assembleia Geral de Acionistas e escolher o Secretário, dentre os presentes; e (c) convocar e presidir as reuniões do Conselho de Administração.



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**REUNIÕES**

Art. 19 - O Conselho de Administração reunir-se-á, (i) ordinariamente, uma vez a cada 3 (três) meses e, (ii) extraordinariamente, mediante convocação do seu Presidente, lavrando-se ata de suas deliberações.

Parágrafo 1º - As reuniões do Conselho deverão ser convocadas por escrito, com no mínimo, 48 (quarenta e oito) horas de antecedência, devendo a convocação conter a ordem do dia e as matérias a serem deliberadas na respectiva reunião.

Parágrafo 2º - O Conselho de Administração deliberará por maioria de votos, presente a maioria de seus membros em exercício, cabendo ao Presidente, além do voto comum, o de qualidade, nos casos de empate.

Parágrafo 3º - É facultado a qualquer dos membros do Conselho fazer-se representar por outro Conselheiro nas reuniões às quais não puder comparecer, desde que tal outorga de poderes de representação seja efetuada mediante instrumento firmado por escrito.

Parágrafo 4º - Sem prejuízo da posterior assinatura da respectiva ata, as reuniões do Conselho de Administração poderão ainda ser realizadas por conferência telefônica, videoconferência, ou por qualquer outro meio de comunicação que permita identificar os membros presentes, bem como sua comunicação simultânea. Os conselheiros poderão ainda participar mediante manifestação por escrito de seus votos, mesmo que não estejam fisicamente presentes.



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**DA DIRETORIA**

**COMPOSIÇÃO**

Art. 20 - A Diretoria será composta de, no mínimo, 3 (três) e, no máximo, 15 (quinze) membros, acionistas ou não, residentes no país, que serão eleitos pelo Conselho de Administração, conforme segue: (a) Diretor Presidente; (b) Diretor de Finanças e de Relações com Investidores; (c) Secretário Geral e Diretor Jurídico; (d) demais Diretores sem designação específica.

Parágrafo 1º - As atribuições individuais dos Diretores sem designação específica serão definidas pelo Conselho de Administração, que também poderá estabelecer designação específica para os referidos cargos.

Parágrafo 2º - Um mesmo Diretor poderá ser eleito para acumular as atribuições de mais de um cargo da Diretoria.

Art. 21 - Em ocorrendo ausências e impedimentos temporários, caberá ao Diretor Presidente designar, dentre os membros da Diretoria, o seu substituto bem como o dos Diretores. No caso de vacância de cargo da Diretoria, a respectiva substituição será deliberada pelo Conselho de Administração.

**COMPETÊNCIA DA DIRETORIA E REPRESENTAÇÃO DA SOCIEDADE**

Art. 22 - A Diretoria é o órgão de representação ativa e passiva da Sociedade, cabendo-lhe, e aos seus membros, individualmente, conforme o caso, cumprir e fazer cumprir este Estatuto Social, as deliberações do Conselho de Administração e da Assembleia Geral de Acionistas e praticar todos os atos necessários ou convenientes à gestão dos negócios sociais. Compete à Diretoria, coletivamente, o seguinte:

(i) - propor ao Conselho de Administração planos e programas gerais da Sociedade, especificando os planos de investimento na expansão e modernização da planta





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(ii) - autorizar, dentro dos limites estabelecidos pelo Conselho de Administração em instrumento normativo interno, a alienação ou oneração dos bens do ativo permanente, inclusive aqueles relacionados aos serviços públicos de telecomunicações que se encontrarem desativados ou inservíveis, bem como submeter ao referido órgão a alienação ou oneração dos bens que ultrapassem esses limites;

(iii) - submeter ao Conselho de Administração e ao Conselho Fiscal, o Relatório Anual de Administração e as Demonstrações Financeiras acompanhados do parecer dos auditores independentes, bem como a proposta de destinação dos lucros apurados no exercício;

(iv) - aprovar, de acordo com os limites estabelecidos pelo Conselho de Administração:  
a) compras de materiais, equipamentos, bens, obras e serviços; b) vendas de bens do ativo;

(v) - aprovar a celebração de outros contratos, não mencionados acima, de acordo com os limites impostos pelo Conselho de Administração;

(vi) - aprovar, anualmente, planejamento de operações financeiras e, trimestralmente, um resumo do cumprimento do referido planejamento;

(vii) - aprovar a criação e a extinção de filiais, escritórios, agências, sucursais e representações da Sociedade, no País;

(viii) - aprovar, conforme lhe for atribuído pelo Conselho de Administração, a estrutura organizacional da Sociedade, mantendo o Conselho de Administração informado a respeito;

(ix) - zelar pelo cumprimento das normas de conduta ética da Sociedade, estabelecidas pelo Conselho de Administração;



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(x) - elaborar e propor ao Conselho de Administração as políticas de responsabilidade institucional da Sociedade, tais como meio ambiente, saúde, segurança e responsabilidade social da Sociedade e implementar as políticas aprovadas;

(xi) - autorizar, de acordo com os limites estabelecidos pelo Conselho de Administração, a prática de atos gratuitos razoáveis em benefício dos empregados ou da comunidade de que participe a Sociedade, inclusive a doação de bens inservíveis para a Sociedade;  
e

(xii) - aprovar a criação de Comitês técnicos e consultivos para seu assessoramento em assuntos de interesse da Sociedade, eleger os membros de tais Comitês e aprovar seus regulamentos internos, que conterão as regras específicas relativas a composição, funções, competência, remuneração e funcionamento.

Parágrafo 1º - As deliberações da Diretoria serão tomadas por maioria de votos, presente a maioria de seus membros, cabendo ao Diretor Presidente, além do voto comum, o de qualidade, nos casos de empate.

Parágrafo 2º - Ressalvados os casos previstos no parágrafo 4º e observadas as disposições contidas neste Estatuto Social, a Sociedade pode ser legalmente vinculada das seguintes formas: i) pela assinatura conjunta de 2 (dois) Diretores estatutários, exceto em casos de urgência, nos quais será permitida a assinatura isolada do Diretor Presidente e "ad referendum", da Diretoria, nos termos do disposto no artigo 23, A-5 deste Estatuto; ii) pela assinatura de 1 (um) Diretor estatutário em conjunto com 1 (um) Procurador; e iii) pela assinatura de 2 (dois) Procuradores em conjunto, desde que investidos de poderes específicos.

Parágrafo 3º - Ressalvados os casos previstos no parágrafo 4º, as procurações serão sempre outorgadas por 2 (dois) Diretores, devendo especificar os poderes conferidos e, com exceção daquelas para fins judiciais, deverão ter um período máximo de validade de 1 (um) ano.



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Parágrafo 4º - A Sociedade poderá ser representada por apenas um Diretor ou um Procurador, investido de poderes específicos, na prática dos seguintes atos:

- (i) recebimento e quitação de valores;
- (ii) assinatura de correspondência que não crie obrigações para a Sociedade;
- (iii) representação da Sociedade em assembleias e reuniões de sócios de sociedades da qual participe;
- (iv) outorga de mandato a advogado para a representação judicial ou em processos administrativos;
- (v) representação em juízo, ou em processos administrativos, exceto para a prática de atos que importem em renúncia a direitos;
- (vi) representação em licitações públicas e concursos privados de que participe a Sociedade, visando a prestação dos serviços contemplados em seu objeto social; e
- (vii) prática de atos de simples rotina administrativa, inclusive perante repartições públicas, sociedades de economia mista, juntas comerciais, Justiça do Trabalho, INSS, FGTS e seus bancos arrecadadores, e outras da mesma natureza.

**COMPETÊNCIAS DOS MEMBROS DA DIRETORIA**

Art. 23 – São as seguintes as competências específicas dos membros da Diretoria:

**A – DIRETOR PRESIDENTE:**

1. Representar a Companhia, em juízo ou fora dele, perante os acionistas e o público em geral, podendo nomear procuradores em conjunto com outro Diretor e designar prepostos, delegar competência aos demais Diretores para a prática de atos específicos;





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5. Executar outras atividades que lhe sejam determinadas pelo Conselho de Administração.

**C – SECRETÁRIO GERAL E DIRETOR JURÍDICO:**

1. Estabelecer diretrizes e supervisionar as atividades da Companhia na área jurídica em geral;
2. Delegar, se for o caso, competência aos demais Diretores para a prática de atos específicos;
3. Representar a Companhia na forma prevista no presente Estatuto Social; e
4. Executar outras atividades que lhe sejam determinadas pelo Conselho de Administração.

**D - DIRETORES SEM DESIGNAÇÃO ESPECÍFICA:**

1. Exercer as funções e atribuições individuais que lhes forem determinadas pelo Conselho de Administração;
2. Assinar em conjunto com outro Diretor estatutário os documentos e atos que reclamem a assinatura de dois Diretores; e
3. Representar a Sociedade na forma prevista no presente Estatuto Social.

**CAPÍTULO VI - DO CONSELHO FISCAL**

Art. 24 - O Conselho Fiscal, de caráter permanente, será composto de, no mínimo, 3 (três) e, no máximo, 5 (cinco) membros efetivos e igual número de suplentes.



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Parágrafo 1º - A remuneração dos membros do Conselho Fiscal, além do reembolso das despesas de locomoção e estada necessárias ao desempenho da função, será fixada pela Assembleia Geral de Acionistas que os eleger e não poderá ser inferior, para cada membro em exercício, a 10% (dez por cento) da que, em média, for atribuída a cada Diretor, não computados benefícios de qualquer natureza, verbas de representação e participação nos lucros.

Parágrafo 2º - Ocorrendo vacância no cargo de membro do Conselho Fiscal, este será substituído por seu respectivo suplente. Havendo vacância da maioria dos cargos, a Assembleia Geral deverá ser convocada para proceder à eleição de seus substitutos.

Parágrafo 3º - O Conselho Fiscal reunir-se-á, (i) ordinariamente, uma vez a cada trimestre e, (ii) extraordinariamente, mediante convocação do Presidente do Conselho de Administração, ou de 2 (dois) membros do Conselho Fiscal, lavrando-se ata de suas deliberações.

Parágrafo 4º - As reuniões do Conselho Fiscal serão convocadas por escrito com, no mínimo, 48 (quarenta e oito) horas de antecedência, devendo a convocação conter a ordem do dia, com a relação das matérias a serem apreciadas, na respectiva reunião.

**CAPÍTULO VII - DO EXERCÍCIO SOCIAL E DAS DEMONSTRAÇÕES  
FINANCEIRAS**

**EXERCÍCIO SOCIAL**

Art. 25 - O exercício social coincidirá com o ano civil, podendo ser levantados, além do anual, balanços semestrais, trimestrais ou em períodos menores.



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**DESTINAÇÃO DOS LUCROS**

Art. 26 – Juntamente com as demonstrações financeiras, o Conselho de Administração apresentará, à Assembleia Geral Ordinária, proposta sobre (i) a participação dos empregados e administradores nos lucros e (ii) a destinação integral do lucro líquido.

Parágrafo 1º - Do lucro líquido do exercício: (i) 5% (cinco por cento) serão destinados para a reserva legal, visando assegurar a integridade física do capital social, limitada a 20% (vinte por cento) do capital social integralizado; (ii) 25% (vinte e cinco por cento) do lucro líquido ajustado na forma dos incisos II e III do art. 202 da Lei nº 6.404/76 serão obrigatoriamente distribuídos como dividendo mínimo obrigatório a todos os acionistas; e (iii) o saldo remanescente, após atendidas as disposições contidas nos itens anteriores deste artigo, terá a destinação determinada pela Assembleia Geral de Acionistas, com base na proposta do Conselho de Administração contida nas demonstrações financeiras. Caso o saldo das reservas de lucros ultrapasse o capital social, a Assembleia Geral de Acionistas deliberará sobre a aplicação do excesso na integralização ou no aumento do capital social ou na distribuição de dividendos adicionais aos acionistas.

Parágrafo 2º - Os dividendos não reclamados em 03 (três) anos, contados da deliberação de sua distribuição, reverterão em favor da Sociedade.

Art. 27 - A Sociedade poderá declarar, por deliberação do Conselho de Administração, dividendos: (i) à conta do lucro apurado em balanços semestrais; (ii) à conta de lucros apurados em balanços trimestrais ou em períodos menores, desde que o total dos dividendos pagos em cada semestre do exercício social não exceda o montante de reservas de capital de que trata o parágrafo primeiro do artigo 182 da Lei 6.404/76, ou (iii) à conta de lucros acumulados ou de reservas de lucros existentes no último balanço anual ou semestral.

Parágrafo Único - Os dividendos intermediários distribuídos nos termos deste artigo serão imputados ao dividendo mínimo obrigatório.



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Art. 28 - Por deliberação do Conselho de Administração e observadas as disposições legais, a Sociedade poderá pagar, aos seus acionistas, juros sobre o capital próprio, os quais poderão ser imputados ao dividendo mínimo obrigatório, "ad referendum" da assembleia geral.

**CAPÍTULO VIII - DISPOSIÇÕES GERAIS**

Art. 29 - A Sociedade entrará em liquidação nos casos previstos em lei, competindo à Assembleia Geral de Acionistas determinar o modo da liquidação e indicar o liquidante.

Art. 30 - A aprovação, pela Sociedade, através de seus representantes, de operações de fusão, cisão, incorporação ou dissolução de suas controladas será precedida de análise econômico-financeira por empresa independente, de renome internacional, confirmando estar sendo dado tratamento equitativo a todas as sociedades interessadas, cujos acionistas terão amplo acesso ao relatório da citada análise.

Art. 31 - Em tudo o que for omissso o presente Estatuto Social, a Sociedade se regerá pelas disposições legais que forem aplicáveis.

**Breno Rodrigo Pacheco de Oliveira**  
Presidente da Assembleia

**Carolina Simões Cardoso**  
Secretária da Assembleia







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**1. DATA, HORA E LOCAL:** Aos 30 dias do mês de novembro de 2018, às 11h00, na sede social da Telefônica Brasil S.A. ("Companhia"), situada na Avenida Engenheiro Luiz Carlos Berrini, nº 1376, 20º andar, auditório, Bairro Cidade Monções, na Cidade de São Paulo, Estado de São Paulo.

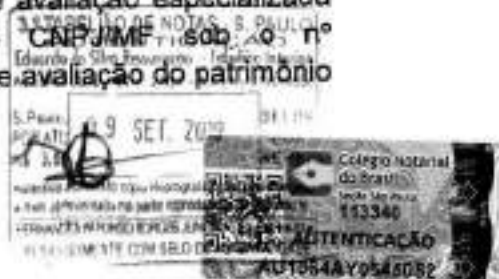
**2. CONVOCAÇÃO:** Foi realizada convocação mediante edital ("Edital de Convocação") publicado no Diário Oficial do Estado de São Paulo, nas edições dos dias 31 de outubro de 2018, 01 de novembro de 2018 e de 02 de novembro de 2018, páginas 7, 17 e 14, respectivamente e, no jornal Valor Econômico, nas edições dos dias 31 de outubro de 2018, 01/02 de novembro de 2018 e 03/04/05 de novembro de 2018, páginas B5, B3 e B3, respectivamente.

**3. PRESENCAS:** Participaram os acionistas representando 94,7% das ações ordinárias, que subscrevem esta ata e constam registrados no Livro de Presença de Acionistas nº 003, folha 011 frente a folha 011 verso, havendo, portanto, quórum para instalação desta Assembleia Geral Extraordinária ("Assembleia") e para deliberação das matérias constantes da ordem do dia. Ainda estavam presentes, o Sr. Breno Rodrigo Pacheco de Oliveira, Secretário Geral e Diretor Jurídico; os Srs. Flávio Stamm, Cremênio Medola Netto, Charles Edwards Allen, membros do Conselho Fiscal; o Sr. Antonio Gonçalves de Oliveira, Conselheiro de Administração; e o Sr. Francisco de Paula dos Reis Júnior da empresa especializada BDO RCS Auditores Independentes S.S.

**4. MESA:** Breno Rodrigo Pacheco de Oliveira – Presidente da Assembleia e Carolina Simões Cardoso – Secretária da Assembleia.

**5. ORDEM DO DIA:**

(1) tomar ciência e ratificar a nomeação da empresa de avaliação especializada BDO RCS Auditores Independentes S.S., inscrita no CNPJ/MF sob o nº 54.276.936/0001-79, responsável pela elaboração do laudo de avaliação do patrimônio



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líquido da Telefônica Data S.A. ("TDATA"), para fins da incorporação do patrimônio líquido da TDATA pela Companhia ("Laudos de Avaliação TDATA");

(2) apreciar e deliberar acerca do Protocolo e Instrumento de Justificação de Incorporação da TDATA pela Companhia, firmado entre a TDATA e a Companhia em 30 de outubro de 2018, tendo por objeto a incorporação da TDATA pela Companhia ("Protocolo de Incorporação");

(3) apreciar e deliberar acerca do Laudo de Avaliação TDATA;

(4) deliberar sobre a incorporação da TDATA pela Companhia e a sua implementação;

(5) deliberar, em decorrência da incorporação proposta, sobre a alteração do artigo 2º do Estatuto Social da Companhia;

(6) deliberar sobre a consolidação do Estatuto Social da Companhia; e

(7) deliberar sobre a destituição de membro do Conselho de Administração indicado pelo Acionista Controlador.

**6. DELIBERAÇÕES:** Dando início aos trabalhos, o Presidente da Assembleia esclareceu que a ata da Assembleia seria lavrada em forma de sumário dos fatos ocorridos, contendo apenas a transcrição das deliberações tomadas, conforme faculta o artigo 130, § 1º da Lei nº 6.404/76, conforme alterada ("Lei das S.A."), e informou que documentos ou propostas, declarações de voto ou dissidências sobre as matérias a serem deliberadas deveriam ser apresentados por escrito à Mesa que, para esse fim, seria representada pela Secretária da Assembleia. Ademais, o Presidente da Assembleia esclareceu que os documentos e informações relativos às matérias a serem discutidas nesta Assembleia, encontravam-se sobre a Mesa. A seguir, foi proposto e aceito pelos acionistas presentes a dispensa da leitura dos documentos, por serem de





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pleno conhecimento de todos, os quais foram disponibilizados na sede da Companhia, bem como nos *websites* da Comissão de Valores Mobiliários - CVM, da B3 – Brasil, Bolsa e Balcão e da Companhia, desde a publicação do Edital de Convocação, em conformidade com as disposições da Lei das S.A. e das Instruções CVM n.º 481/2009 e n.º 565/2015.

O Sr. Presidente esclareceu que, como era de conhecimento de todos, a Assembleia tinha por objetivo principal discutir e deliberar sobre a incorporação pela Companhia de sua subsidiária integral, TDATA ("incorporação").

Complementou informando que, por meio da Incorporação, o que se pretende é a padronização da prestação dos serviços, a simplificação da estrutura organizacional e societária atual da Companhia, bem como auxílio na integração dos negócios dessa com a TDATA.

Adicionalmente, o Sr. Presidente da Assembleia ressaltou que a Incorporação foi previamente analisada pelo Comitê de Auditoria e Controle, apreciada pelo Conselho Fiscal, e aprovada pelo Conselho de Administração da Companhia, os quais foram favoráveis a todos os itens da ordem do dia que lhes competiam.

Por fim, informou que a pretendida Incorporação não resultará em aumento de capital da Companhia, tampouco na emissão de novas ações pela Companhia, de modo que a Incorporação não acarretará qualquer alteração nas participações acionárias dos atuais acionistas da Companhia, uma vez que a Companhia já tem registrado em seu patrimônio líquido o valor da totalidade das ações da TDATA, não havendo, também, que se falar em substituição de ações de acionistas não controladores da TDATA por ações da Companhia, dado que a Companhia é a única acionista da TDATA, bem como não acarretará qualquer direito de recesso aos acionistas da Companhia.

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Após os esclarecimentos acima, os senhores acionistas apreciaram as matérias constantes da Ordem do Dia, conforme abaixo, sendo recepcionadas e autenticadas as indicações de voto pela Secretária da Mesa, e deliberaram o quanto segue:

- (1) Ratificar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), a nomeação da empresa especializada BDO RCS Auditores Independentes S.S., para elaboração do Laudo de Avaliação TDATA, para fins da incorporação do patrimônio líquido da TDATA pela Companhia.
- (2) Aprovar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), todos os termos e condições do Protocolo de Incorporação, constante deste instrumento como seu Anexo II. O Protocolo de Incorporação estabelece os termos e condições gerais da operação de Incorporação pretendida, as suas justificativas e o critério de avaliação do patrimônio líquido da TDATA a ser incorporado pela Companhia.
- (3) Aprovar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), o Laudo de Avaliação TDATA, elaborado com base no seu valor contábil na data de 30 de setembro de 2018, o qual estabelece que o valor do patrimônio líquido da TDATA a ser incorporado pela Companhia é de R\$ 1.691.435.625,47 (um bilhão, seiscentos e noventa e um milhões, quatrocentos e trinta e cinco mil, seiscentos e vinte e cinco reais e quarenta e sete centavos), tudo em conformidade com o previsto no Protocolo de Incorporação. O Laudo de Avaliação TDATA é parte integrante da presente ata como Anexo A do Protocolo de Incorporação.
- (4) Aprovar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), a incorporação, pela Companhia, da TDATA



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pelo valor descrito no Laudo de Avaliação TDATA, sem alteração do capital social da Companhia, em conformidade com o Protocolo de Incorporação, já aprovado e anexo ao presente instrumento. Fica registrado que, conforme consta do Protocolo de Incorporação, a Incorporação deverá produzir efeitos operacionais para as sociedades envolvidas a partir de 1º de dezembro de 2018.

- (5) Aprovar, em decorrência da Incorporação, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), a alteração do artigo 2º do Estatuto Social da Companhia para complementação do objeto social da Companhia de forma a prever as atividades atualmente desenvolvidas pela TDATA e, indiretamente, pela própria Companhia. Fica consignado que, em virtude da complementariedade e caráter acessório das atividades a serem incluídas no objeto social da Companhia, a Incorporação não acarretará em alteração do seu ramo de negócios nem de sua finalidade social. Ademais, como referidas atividades vem sendo exercidas pela TDATA, uma subsidiária integral da Companhia, tais atividades já são indiretamente exercidas pela Companhia. Portanto, não haverá efetiva mudança do objeto social da Companhia, não havendo que se falar em direito de recesso aos seus acionistas, de que tratam os artigos 136, incisos IV e VI, e 137 da Lei das S.A. Assim, o artigo 2º do Estatuto Social da Companhia passará a vigorar com a seguinte nova redação:

*"Art. 2 - A Sociedade tem por objeto:*

- a) a exploração de serviços de telecomunicações;  
b) o desenvolvimento das atividades necessárias ou úteis à execução desses serviços, na conformidade das concessões, autorizações e permissões que lhe forem outorgadas;  
c) A exploração de serviços de valor adicionado, incluindo, disponibilização sem cessão definitiva, de conteúdo de áudio, vídeo, imagem e texto, aplicativos e congêneres;  
d) A exploração de soluções integradas, gestão e prestação de serviços relacionados a: (i) data center, incluindo hospedagem e colocation; (ii) armazenamento, processamento e gerenciamento de dados, informações,





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*textos, imagens, vídeos, aplicativos e sistemas de informações e congêneres;*  
*(iii) tecnologia da informação; (iv) segurança da informação e da comunicação;*  
*(v) telecomunicações; e (vi) sistemas de segurança eletrônica relacionados a*  
*roubo, intrusão, incêndio e outros; e*  
e) *Licenciamento e sub-licenciamento de softwares de qualquer natureza.*

*Parágrafo Único - Na consecução do seu objeto, a Sociedade poderá incorporar*  
*ao seu patrimônio bens e direitos de terceiros, bem como:*

- I - participar do capital de outras empresas, inclusive visando ao cumprimento da política nacional de telecomunicações;*
- II - constituir empresas e/ou subsidiárias para a execução de atividades compreendidas no seu objeto e que se recomende sejam descentralizadas;*
- III - promover a importação de bens e serviços necessários à execução de atividades compreendidas no seu objeto;*
- IV - prestar serviços de assistência técnica às empresas do setor de telecomunicações, executando atividades de interesse comum;*
- V - gerir e prestar serviços de manutenção, assistência e suporte técnico em informática e em equipamentos relacionados às atividades da Sociedade;*
- VI - prestar serviços de consultoria relacionadas às atividades da Sociedade;*
- VII - elaborar, implantar e instalar projetos relacionados às atividades da Sociedade;*
- VIII - gerir e prestar serviços de engenharia e executar obras de construção civil e correlatas, necessárias para a execução de projetos relacionados às atividades da Sociedade;*
- IX - prestar serviços de monitoramento relacionados às atividades da Sociedade;*
- X - prestar serviço de intermediação de negócios em geral; e*
- XI - comercializar e locar equipamentos e materiais necessários ou úteis à exploração de suas atividades, incluindo equipamentos de precisão, medição e sensores eletrônicos;*
- XII - efetuar atividades de estudos e pesquisas, visando ao desenvolvimento do setor de telecomunicações;*
- XIII - celebrar contratos e convênios com outras empresas exploradoras de serviços de telecomunicações ou quaisquer pessoas ou entidades, objetivando assegurar a operação dos serviços, sem prejuízo das atribuições e responsabilidades; e*
- XIV - exercer outras atividades afins ou correlatas que lhe forem atribuídas pela Agência Nacional de Telecomunicações - ANATEL."*



TELEFÔNICA BRASIL S.A.  
Companhia Aberta  
CNPJ/MF n.º 02.558.157/0001-62  
NIRE 35.3.0015861-4

**ATA DA 50ª ASSEMBLEIA GERAL EXTRAORDINÁRIA DA  
TELEFÔNICA BRASIL S.A. REALIZADA EM 30 DE NOVEMBRO DE 2018**

- (6) Aprovar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), a consolidação do Estatuto Social da Companhia, considerando as alterações deliberadas nesta Assembleia, passando o mesmo a fazer parte do presente instrumento como seu Anexo III.

Aprovada a operação, foram autorizados os Administradores da Companhia a praticarem todos os atos que se fizerem necessários à formalização das operações acima aprovadas perante os órgãos públicos e terceiros em geral.

- (7) Aprovar, por unanimidade de votos dos acionistas presentes (conforme mapa de votação constante do Anexo I), conforme solicitação apresentada pelo acionista controlador Telefônica S.A., a destituição do membro do Conselho de Administração indicado pelo acionista controlador, Sr. **Ramiro Sánchez de Lerín García-Ovies**, espanhol, casado, advogado, portador do Passaporte nº AAJ946379, residente e domiciliado em Madrid, Espanha, com endereço comercial em Gran Vía, 28, na Cidade de Madrid, Espanha, 28013, eleito na 18ª Assembleia Geral Ordinária e 46ª Assembleia Geral Extraordinária realizada em 28 de abril de 2016, sendo que tal cargo permanecerá temporariamente vago até posterior eleição do novo titular.

**7. MAPA DE VOTAÇÃO:** Em atendimento ao artigo 30, parágrafo 4º, da Instrução CVM nº 480/09, o mapa de votação é firmado pelo Presidente e pela Secretária da presente Assembleia, e é parte desta ata como seu Anexo I, indicando quantidade de aprovações, rejeições e abstenções que cada deliberação recebeu.

**8. ENCERRAMENTO:** Nada mais a ser tratado, o Presidente da Assembleia declarou encerrados os trabalhos, ficando cientes os representantes dos acionistas da sua lavratura em forma de sumário, como facultado pelo artigo 130, § 1º da Lei das S.A. Ficou consignado, ainda, que: (i) conforme faculta o § 2º do artigo 130, da Lei das S.A., a publicação da ata será feita com omissão da assinatura dos acionistas; e (ii) os votos por escrito, foram recebidos, numerados e autenticados pela Mesa, ficando arquivados.

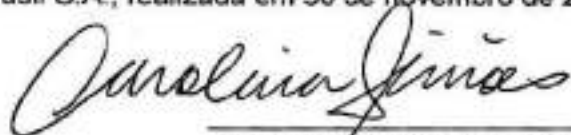


**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta  
CNPJ/MF n.º 02.558.157/0001-62  
NIRE 35.3.0015881-4

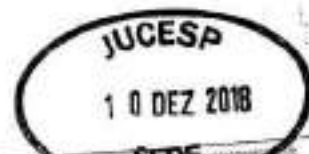
**ATA DA 50ª ASSEMBLEIA GERAL EXTRAORDINÁRIA DA  
TELEFÔNICA BRASIL S.A. REALIZADA EM 30 DE NOVEMBRO DE 2018**

na sede da Companhia, nos termos do artigo 130, §1º, da Lei das Sociedades por Ações. A ata foi lida, aprovada e assinada por todos os presentes. Mesa: (aa) Breno Rodrigo Pacheco de Oliveira - Presidente da Assembleia, representando a Administração; Carolina Simões Cardoso - Secretária da Assembleia. Acionistas: SP TELECOMUNICAÇÕES PARTICIPAÇÕES LTDA., p.p. Carolina Simões Cardoso; TELEFÔNICA LATINOAMÉRICA HOLDING, S.L., p.p. Carolina Simões Cardoso; TELEFÔNICA S.A., p.p. Carolina Simões Cardoso; TELEFÔNICA CHILE S.A., p.p. Carolina Simões Cardoso; ABERDEEN CHILE FUND, INC.; BRANDES GLOBAL EQUITY INCOME FUND; BRANDES GLOBAL OPPORTUNITIES VALUE FUND; BRANDES INSTITUTIONAL EQUITY TRUST; JAPAN TRUSTEE SERVICES BANK, LTD. STB BRAZIL STOCK MOTHER FUND, representados por CITIBANK N.A., p.p. Diane Flávia Maia de Oliveira; ABERDEEN GLOBAL BRAZIL EQUITY FUND; ABERDEEN GLOBAL EMERGING MARKETS INFRASTRUCTURE EQUITY FUND, representados por Banco BNP Paribas Brasil S.A., p.p. Diane Flávia Maia de Oliveira. Outros: Flávio Stamm - Conselheiro Fiscal; Cremênio Medola Netto - Conselheiro Fiscal; Charles Edwards Allen - Conselheiro Fiscal; Antonio Gonçalves de Oliveira - Conselheiro de Administração; Francisco de Paula dos Reis Júnior - BDO RCS Auditores Independentes S.S.

Certifico que a presente é cópia fiel da ata da 50ª Assembleia Geral Extraordinária, da Telefônica Brasil S.A., realizada em 30 de novembro de 2018, lavrada em livro próprio.



**Carolina Simões Cardoso**  
Secretária da Assembleia





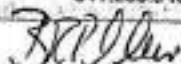
# Telefonica

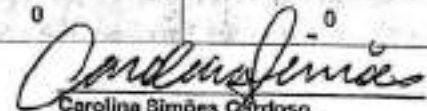
TELEFÔNICA BRASIL S.A.  
Companhia Aberta  
CNPJ/MF n.º 02.558.157/0001-62  
NIRE 35.3.0015881-4

## ATA DA 50ª ASSEMBLEIA GERAL EXTRAORDINÁRIA DA TELEFÔNICA BRASIL S.A. REALIZADA EM 30 DE NOVEMBRO DE 2018

### Anexo I - Mapa de Votação

	APROVAR	REJEITAR	ABSTER-SE	RESULTADO DA VOTAÇÃO
	Número de ações ON	Número de ações ON	Número de ações ON	Redação que Consta na Ata da AGE
(1) tomar ciência e ratificar a nomeação da empresa de avaliação especializada, responsável pela elaboração do laudo de avaliação do patrimônio líquido da TDATA.	541.239.043	0	0	Aprovado por unanimidade de votos
(2) apreciar e deliberar acerca do Protocolo de Incorporação.	541.239.043	0	0	Aprovado por unanimidade de votos
(3) apreciar e deliberar acerca do Laudo de Avaliação TDATA.	541.239.043	0	0	Aprovado por unanimidade de votos
(4) deliberar sobre a incorporação da TDATA pela Companhia e a sua implementação	541.239.043	0	0	Aprovado por unanimidade de votos
(5) deliberar, em decorrência da incorporação proposta, sobre a alteração do artigo 2º do Estatuto Social da Companhia.	541.239.043	0	0	Aprovado por unanimidade de votos
(6) deliberar sobre a consolidação do Estatuto Social da Companhia.	541.239.043	0	0	Aprovado por unanimidade de votos
(7) deliberar sobre a destituição de membro do Conselho de Administração indicado pelo Acionista Controlador.	541.239.043	0	0	Aprovado por unanimidade de votos

  
Breno Rodrigo Pacheco da Oliveira  
Presidente da Assembleia

  
Carolina Simões Cardoso  
Secretária da Assembleia

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54





TELEFÔNICA BRASIL S.A.  
Companhia Aberta  
CNPJ/MF n.º 02.558.157/0001-62  
NIRE 35.3.0015881-4

ATA DA 50ª ASSEMBLEIA GERAL EXTRAORDINÁRIA DA  
TELEFÔNICA BRASIL S.A. REALIZADA EM 30 DE NOVEMBRO DE 2018

**Anexo II**  
**Protocolo de Incorporação**



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PROTOCOLO E INSTRUMENTO DE JUSTIFICAÇÃO  
DE INCORPORAÇÃO

DA

TELEFÔNICA DATA S.A.

PELA

TELEFÔNICA BRASIL S.A.

Pelo presente instrumento particular, as partes abaixo qualificadas, por seus respectivos Diretores, têm entre si certo e ajustado celebrar o presente Protocolo e Instrumento de Justificação de Incorporação ("Protocolo"), de acordo com os artigos 224, 225, 226 e 227 da Lei nº 6.404, de 15 de dezembro de 1976, conforme alterada ("Lei das S.A."), observando-se as disposições aplicáveis da Instrução nº 565, de 15 de junho de 2015, emitida pela Comissão de Valores Mobiliários ("CVM");

(a) **TELEFÔNICA BRASIL S.A.**, sociedade por ações de capital aberto com sede na Cidade de São Paulo, Estado de São Paulo, na Avenida Eng. Luiz Carlos Berrini, nº 1376, inscrita no CNPJ/MF sob o nº 02.558.157/0001-62, neste ato representada nos termos de seu Estatuto Social ("Telefônica" ou "Incorporadora"); e

(b) **TELEFÔNICA DATA S.A.**, sociedade por ações de capital fechado com sede na Cidade de Barueri, Estado de São Paulo, com sede na Avenida Tamboré, nº 341 - Parte, Bairro Alphaville, CEP 06460-000, inscrita no CNPJ/MF sob o nº 04.027.547/0036-61, neste ato representada nos termos de seu Estatuto Social ("TDATA" ou "Incorporada");

Sendo Telefônica e TDATA, designadas conjuntamente "Partes" ou "Companhias".

1. JUSTIFICAÇÃO.

CONSIDERANDO que a TDATA é subsidiária integral da Telefônica;

CONSIDERANDO QUE a TDATA tem como objeto social principal a exploração de serviços de valor adicionado, incluindo, disponibilização sem cessão definitiva, de



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conteúdo de áudio, vídeo, imagem e texto, aplicativos e congêneres e a exploração de soluções integradas;

CONSIDERANDO QUE as atividades desenvolvidas pela TDATA são complementares ao objeto social da Telefônica, exploradora de serviços de telecomunicações e que desenvolve também atividades necessárias ou úteis à execução desses serviços, conforme as concessões, autorizações e permissões a ela outorgadas, uma vez que a TDATA desenvolve atividades adicionais e complementares às desenvolvidas por sua controladora e que acrescentam, ao serviço de telecomunicações, novas utilidades; e

CONSIDERANDO QUE, em virtude da complementariedade dos objetos sociais das Partes, a consolidação das atividades atualmente desenvolvidas por cada uma delas em uma única sociedade mostra-se operacionalmente viável e benéfica por minimizar custos e simplificar processos;

As Partes entendem que a incorporação da TDATA pela Telefônica, nos termos e condições deste Protocolo se justifica, pois, além da padronização da prestação dos serviços, bem como visa a simplificar a estrutura organizacional e societária atual da Telefônica.

## 2. CAPITAL SOCIAL DA TELEFÔNICA E DA TDATA

**2.1. Capital Social da Telefônica:** O capital social atual subscrito e integralizado da Telefônica é de R\$ 63.571.415.865,09 (sessenta e três bilhões, quinhentos e setenta e um milhões, quatrocentos e quinze mil, oitocentos e sessenta e cinco reais e nove centavos), representado por 1.690.984.923 (um bilhão, seiscentos e noventa milhões, novecentas e oitenta e quatro mil, novecentas e vinte e três) ações nominativas escriturais e sem valor nominal, sendo 571.644.217 (quinhentos e setenta e um milhões, seiscentas e quarenta e quatro mil, duzentas e dezessete) ações ordinárias e 1.119.340.706 (um bilhão, cento e dezenove milhões, trezentas e quarenta mil, setecentas e seis) ações preferenciais.

**2.2. Capital Social da TDATA:** O capital social atual subscrito e integralizado da TDATA é de R\$ 578.114.259,52 (quinhentos e setenta e oito milhões, cento e quatorze mil, duzentos e cinquenta e nove reais e cinquenta e dois centavos), dividido em 2.704.122.564 (dois bilhões, setecentos e quatro milhões, cento e vinte e duas mil e quinhentas e sessenta e quatro) ações ordinárias todas nominativas e sem valor nominal.





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participação de seus acionistas, uma vez que a Telefônica já tem registrado em seu patrimônio líquido o valor da totalidade das ações da TDATA.

**4.2. Tratamento das Ações da Incorporada:** Considerando que a TDATA é subsidiária integral da Telefônica (inexistindo, portanto, acionistas minoritários na TDATA), em decorrência da incorporação, as ações de emissão da TDATA serão canceladas e extintas, conforme faculta o artigo 226, parágrafo 1º da Lei das S.A.

**4.3. Inexistência de relação de substituição e de avaliação de patrimônios líquidos a preços de mercado para fins do artigo 264 da Lei das S.A.:** Tendo em vista que a TDATA é subsidiária integral da Telefônica, não há relação de substituição de ações de minoritários da Incorporada por ações da Incorporadora. Nos termos do disposto na Deliberação CVM nº 559/08 e de acordo com o entendimento da Superintendência de Relações com Empresas – SEP, não se justifica a *"elaboração de laudo com base no valor do patrimônio líquido das ações da controladora e da controlada, avaliados os dois patrimônios segundo os mesmos critérios e na mesma data, a preços de mercado"* prevista no art. 264 da Lei das S.A. e no artigo 8º da Instrução CVM 565/15.

## 5. DEMAIS CONDIÇÕES APLICÁVEIS À INCORPORAÇÃO.

**5.1. Atos Societários:** Serão realizadas Assembleias Gerais Extraordinárias da TDATA e da Telefônica, para apreciação e deliberação a respeito da incorporação, especialmente para: (a) aprovação do presente Protocolo; (b) ratificação da nomeação da empresa de avaliação independente; (c) aprovação do Laudo de Avaliação; (d) aprovação da incorporação; (e) complementação do objeto social da Telefônica de forma a detalhar as atividades atualmente desenvolvidas pela TDATA e, indiretamente, pela própria Telefônica; e (f) autorização à administração da TDATA e da Telefônica a praticar todos os atos necessários para sua implementação.

**5.2. Inexistência de Direito de Recesso:** Caso a incorporação seja aprovada, as atividades desenvolvidas pela TDATA, complementares às atividades desenvolvidas pela Telefônica, deverão ser acrescidas ao objeto social da Incorporadora, por meio de alteração do seu Estatuto Social a ser deliberada no mesmo ato. Em virtude da complementariedade e caráter acessório das atividades a serem incluídas no objeto social da Incorporadora, a incorporação não acarretará em alteração do seu ramo de negócios nem de sua finalidade social. Ademais, como referidas atividades vem sendo exercidas pela TDATA, uma subsidiária integral da Telefônica, tais atividades já são indiretamente exercidas pela Incorporadora. Portanto, não haverá efetiva mudança do objeto social da Telefônica, não havendo que se falar em direito de recesso aos acionistas da Incorporadora, de que tratam os artigos 136, incisos IV e VI, e 137 da Lei das S.A.



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5.3. **Sucessão:** A Incorporadora sucederá a TDATA em seus direitos e obrigações, respondendo pelas obrigações da TDATA nos termos do disposto nos artigos 227 e 232, da Lei das S.A.

5.4. **Autorização:** Os Diretores da Incorporadora e da Incorporada ficam responsáveis e autorizados a tomarem as medidas necessárias para a implementação dos termos e condições pactuados neste Protocolo, nos termos da legislação aplicável.

5.5. **Foro:** Fica eleito o Foro da Cidade de São Paulo, Estado de São Paulo, para dirimir quaisquer controvérsias oriundas deste Protocolo.

E, por estarem assim justas e contratadas, assinam o presente instrumento em 08 (oito) vias de igual teor e para um só efeito, juntamente com duas testemunhas.

São Paulo, 30 de outubro de 2018.

**Telefônica Brasil S.A.**

  
\_\_\_\_\_

**Eduardo Navarro de Carvalho**

  
\_\_\_\_\_

**Breno Rodrigo Pacheco de  
Oliveira**

**Telefônica Data S.A.**

  
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**David Melcon Sanchez-Friera**

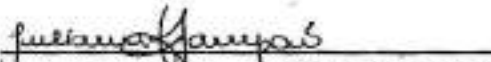
  
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**Breno Rodrigo Pacheco de  
Oliveira**

Testemunhas:

1.   
\_\_\_\_\_

Nome: PABLO A. P. EUBERT  
RG: 6.092.359-0 / PR

2.   
\_\_\_\_\_

Nome: JULIANA C. SATUPACO TOURINHO  
RG: 0837421667 SSP-BA







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TELEFÔNICA DATA S.A.

Laudo de avaliação do patrimônio líquido  
contábil apurado por meio dos Livros  
Contábeis

Em 30 de setembro de 2018

PPRJ/TGM/AC/LCSM/TMS



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TELEFÔNICA DATA S.A.

Laudo de avaliação do patrimônio líquido contábil apurado por meio dos Livros Contábeis

Conteúdo

Laudo de avaliação do patrimônio líquido contábil apurado por meio dos Livros Contábeis

Anexo I - balanço patrimonial levantados em 30 de setembro de 2018

Anexo II - notas explicativas da Administração sobre as práticas contábeis adotadas para o balanço patrimonial



## LAUDO DE AVALIAÇÃO CONTÁBIL DO PATRIMÔNIO LÍQUIDO CONTÁBIL APURADO POR MEIO DOS LIVROS CONTÁBEIS

Aos  
Acionistas e Administradores da  
Telefônica Data S.A.  
São Paulo - SP

A BDO RCS Auditores Independentes S.S., sociedade estabelecida na capital do Estado de São Paulo, na Rua Major Quedinho, nº 90, inscrita no Cadastro Nacional de Pessoa Jurídica do Ministério da Fazenda (CNPJ) sob o nº 54.276.936/0001-79, registrada originariamente no Conselho Regional de Contabilidade (CRC) do Estado de São Paulo sob o nº 2 SP 013846/O-1, tendo como responsável técnico Francisco de Paula dos Reis Júnior, portador do RG nº 9.448.100, inscrito no CPF sob o nº 007.190.878-13, registrado no CRC sob o nº 1 SP 139268/O-6, residente e domiciliado em São Paulo - SP, com escritório no mesmo endereço da representada, nomeada perita pela Administração da Telefônica Data S.A. ("Companhia") para proceder à avaliação do patrimônio líquido contábil em 30 de setembro de 2018, de acordo com as práticas contábeis adotadas no Brasil, apresenta a seguir o resultado de seus trabalhos:

### 1. Objetivo da avaliação

A avaliação do patrimônio líquido contábil em 30 de setembro de 2018 da Telefônica Data S.A. tem por objetivo único, registrar a avaliação, pelo valor do patrimônio líquido apurado por meio dos livros contábeis da Companhia, para fins de incorporação total pela sua controladora Telefônica Brasil S.A.

A Incorporação visa simplificar a estrutura societária da Telefônica Brasil S.A. e a concentração de prestação de serviço da Companhia, como parte de um processo contínuo de simplificação e promoção de um ambiente de convergência no relacionamento da Telefônica Brasil S.A., com os seus clientes.

### 2. Responsabilidade da Administração sobre as informações contábeis

A Administração da Companhia é responsável pela escrituração dos livros e preparação de informações contábeis de acordo com as práticas contábeis adotadas no Brasil, assim como pelos controles internos relevantes que ela determinou como necessários para permitir a elaboração de tais informações contábeis livres de distorções relevantes, independentemente se causada por fraude ou erro. O resumo das principais práticas contábeis adotadas pela Companhia está descrito no Anexo II, ao final deste relatório.

### 3. Alcance dos trabalhos e responsabilidade dos auditores independentes

Nossa responsabilidade é a de expressar uma conclusão sobre o valor contábil do patrimônio líquido da Telefônica Data S.A. em 30 de setembro de 2018, com base nos trabalhos conduzidos de acordo com o Comunicado Técnico CTA 20 (R1) aprovado pelo Conselho Federal de Contabilidade (CFC) que prevê a aplicação de procedimentos de exame de auditoria no balanço patrimonial da Companhia. Assim, efetuamos o exame do referido balanço patrimonial da Companhia de acordo com as normas brasileiras e internacionais de auditoria, que requerem o cumprimento de exigências éticas pelo auditor e que a auditoria seja planejada e executada com o objetivo de obter segurança razoável de que o patrimônio líquido contábil apurado para a elaboração do nosso laudo está livre de distorções relevantes.



Uma auditoria envolve a execução de procedimentos selecionados para obtenção de evidência a respeito dos valores contabilizados. Os procedimentos selecionados dependem do julgamento do auditor, incluindo a avaliação dos riscos de distorção relevante no patrimônio líquido, independentemente se causada por fraude ou erro. Nessa avaliação de riscos, o auditor considera os controles internos relevantes para a elaboração do balanço patrimonial da Companhia para planejar os procedimentos de auditoria que são apropriados nas circunstâncias, mas não para fins de expressar uma opinião sobre a efetividade desses controles internos da Companhia. Uma auditoria inclui também a avaliação da adequação das políticas contábeis utilizadas e a razoabilidade das estimativas contábeis feitas pela Administração. Acreditamos que a evidência de auditoria obtida é suficiente e apropriada para fundamentar nossa conclusão.

#### 4. Conclusão

Com base nos trabalhos efetuados, concluímos que o patrimônio líquido contábil é de R\$ 1.691.435.625,47, conforme balanço patrimonial levantado em 30 de setembro de 2018, registrado nos livros contábeis e resumido no Anexo I, ao final deste relatório, e, representa, em todos os aspectos relevantes, o patrimônio líquido contábil da Telefônica Data S.A., avaliado de acordo com as práticas contábeis adotadas no Brasil.

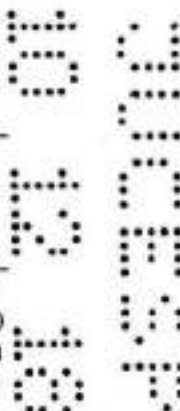
São Paulo, 17 de outubro de 2018.



Balço patrimonial levantado em 30 de setembro de 2018  
(Valores expressos em Reais)

Ativo		Passivo e patrimônio líquido	
<b>Ativo circulante</b>	<b>2.257.356.456,55</b>	<b>Passivo circulante</b>	<b>1.270.376.244,19</b>
Caixa e equivalentes de caixa	255.426.212,31	Pessoal, encargos e benefícios sociais	64.044.648,94
Contas a receber	838.330.901,63	Fornecedores	866.541.882,28
Estoques	36.073.121,41	Imposto de Renda e Contribuição Social a recolher	75.384.775,88
Imposto de Renda e Contribuição Social a recuperar	131.229,64	Impostos, taxas e contribuições a recolher	70.138.558,47
Impostos, taxas e contribuições a recuperar	8.852.449,28	Receitas diferidas	1.161.284,97
Depósitos e bloqueios judiciais	188.835,21	Obrigações com empresas do grupo	183.903.643,99
Despesas antecipadas	15.334.888,43	Outros passivos	9.201.440,66
Dividendos e juros sobre o capital próprio	118.628.110,35	<b>Passivo não circulante</b>	<b>57.828.292,68</b>
Creditos com empresas do grupo	971.503.366,78	Pessoal, encargos e benefícios sociais	1.897.775,54
Outros ativos	12.887.541,51	Impostos, taxas e contribuições a recolher	19.594.570,50
<b>Ativo não circulante</b>	<b>762.283.505,79</b>	Provisões	27.234.640,21
<b>Realizável a longo prazo</b>	<b>351.370.603,11</b>	Outros passivos	9.101.298,43
Contas a receber	157.684.778,10	<b>Total do passivo</b>	<b>1.328.204.536,87</b>
Imposto de Renda e Contribuição Social diferidos	154.486.698,52	<b>Patrimônio líquido</b>	<b>1.691.435.625,47</b>
Depósitos e bloqueios judiciais	35.061.385,44	Capital social	578.114.259,52
Despesas antecipadas	3.984.421,81	Transações de capital	(59.029.128,85)
Creditos com empresas do grupo	14.282,74	Reservas de capital	1.138.988,11
Outros ativos	139.036,50	Reservas de lucro	115.622.851,90
Investimentos	300.226.577,72	Lucros acumulados	1.055.588.654,79
Imobilizado	92.430.692,93	<b>Total do passivo e patrimônio líquido</b>	<b>3.019.640.162,34</b>
Intangível	18.255.632,03		
<b>Total do ativo</b>	<b>3.019.640.162,34</b>		

Este anexo é parte integrante do laudo de avaliação do patrimônio líquido contábil, apurado por meio dos Livros Contábeis, datado de 30 de setembro de 2018.



## Anexo II

Laudo de avaliação apurado por meio dos Livros Contábeis  
Notas explicativas da Administração sobre as práticas contábeis adotadas para o  
balanço patrimonial  
Em 30 de setembro de 2018  
(Em Reais)

## 1. A Companhia e suas operações

## a) Informações gerais

A Telefônica Data S.A. ("Companhia" ou "TData"), tem sua sede à Av. Tamboré nº 341, parte, no Município de Barueri no Estado de São Paulo, foi constituída em 3 de agosto de 2000, sob forma de Sociedade Anônima de capital fechado, como subsidiária integral da Telefônica Brasil S.A. ("Telefônica Brasil").

A TDATA tem por objeto: (I) A exploração de serviços de valor adicionado, incluindo, disponibilização sem cessão definitiva, de conteúdo de áudio, vídeo, imagem e texto, aplicativos e congêneres; (II) A exploração de soluções integradas, gestão e prestação de serviços relacionados a: (a) data center, incluindo hospedagem e *colocation*; (b) armazenamento, processamento e gerenciamento de dados, informações, textos, imagens, vídeos, aplicativos e sistemas de informações e congêneres; (c) tecnologia da informação; (d) segurança da informação e da comunicação; (e) telecomunicações; e (f) sistemas de segurança eletrônica relacionados a roubo, intrusão, incêndio e outros; (III) Licenciamento e sub-licenciamento de softwares de qualquer natureza; (IV) A gestão e prestação de serviços de manutenção, assistência e suporte técnico em informática e de equipamentos relacionados às atividades da Companhia; (V) Prestação de serviços de consultoria relacionadas às atividades da Companhia; (VI) A prestação e exploração de serviços de telecomunicações; (VII) Comercialização e locação de equipamentos e materiais necessários ou úteis à exploração de suas atividades, incluindo equipamentos de precisão, medição e sensores eletrônicos; (VIII) Elaboração, implantação e instalação de projetos relacionados às atividades da Companhia; (IX) Gestão e prestação de serviços de engenharia e execução de obras de construção civil e correlatas, necessárias para a execução de projetos relacionados às atividades da Companhia; (X) Prestação de serviços de monitoramento relacionados às atividades da Companhia; e (XI) A prestação de serviço de intermediação de negócios em geral. Na consecução do seu objeto, a Companhia poderá incorporar ao seu patrimônio bens e direitos de terceiros, bem como: I - participar do capital de outras empresas; II - constituir empresas e/ou subsidiárias para a execução de atividades compreendidas no seu objeto e que se recomende sejam descentralizadas; III - promover a importação de bens e serviços necessários à execução de atividades compreendidas no seu objeto; e IV - celebrar contratos e convênios com outras empresas exploradoras de serviços de telecomunicações ou quaisquer pessoas ou entidades, objetivando assegurar a operação dos serviços, sem prejuízo das atribuições e responsabilidades.



## 2. Base de elaboração e apresentação do balanço patrimonial

O balanço patrimonial em 30 de setembro de 2018 está sendo apresentado para fins de avaliação do patrimônio líquido contábil em 30 de setembro de 2018 da Telefônica Data S.A. e tem por objetivo único, registrar a avaliação, pelo valor do patrimônio líquido apurado por meio dos Livros Contábeis da Companhia, para fins de incorporação total pela sua controladora integral - Telefônica Brasil S.A.

O balanço patrimonial foi preparado de acordo com as práticas contábeis adotadas no Brasil, as quais compreendem os Pronunciamentos, as Interpretações e às Orientações emitidos pelo Comitê de Pronunciamentos Contábeis (CPC), que foram aprovados pelo Conselho Federal de Contabilidade (CFC).

O balanço patrimonial da Companhia foi preparado e está apresentado em Reais, que é a moeda funcional. A moeda funcional foi determinada em função do ambiente econômico primário de suas operações.

Um ativo ou passivo é registrado como circulante se é esperado que a liquidação ocorra dentro do período de 12 meses subsequentes à data base do balanço patrimonial, caso contrário será registrado como não circulante.

## 3. Resumo das principais práticas contábeis

### a) Caixa e equivalentes de caixa

São mantidos com a finalidade de atender a compromissos de caixa de curto prazo, e não para investimento ou outros fins. A Companhia considera equivalente de caixa uma aplicação financeira de liquidez imediata, sujeita a um insignificante risco de mudança de valor. Aplicações financeiras se qualificam como equivalente de caixa quando resgatáveis no prazo de até 90 dias das datas das contratações.

### b) Contas a receber

Estão avaliadas pelo valor dos serviços prestados de acordo com as condições contratadas, líquido das perdas estimadas para redução ao valor recuperável. Inclui os serviços prestados aos clientes que ainda não foram faturados até a data do balanço. As perdas estimadas para redução ao valor recuperável são constituídas em montante suficiente para cobrir eventuais perdas e considera principalmente a inadimplência esperada.

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(Em Reais)

c) Estoques

São avaliados e demonstrados pelo custo médio de aquisição ou pelo valor realizável líquido, dos dois o menor. Compreende os materiais destinados a consumo, manutenção ou revenda. O valor realizável líquido corresponde ao preço de venda no curso normal dos negócios, menos os custos estimados necessários para a realização da venda.

As perdas estimadas para redução ao valor realizável são constituídas para os materiais e aparelhos considerados obsoletos ou cujas quantidades são superiores àquelas usualmente comercializadas pela Companhia em um período razoável de tempo.

d) Despesas antecipadas

Estão demonstradas pelos valores efetivamente desembolsados relativos a serviços contratados e ainda não incorridos. As despesas antecipadas são apropriadas ao resultado à medida que os serviços relacionados são prestados e os benefícios econômicos são auferidos.

e) Investimentos

A participação societária em controladas está avaliada pelo método da equivalência patrimonial.

Com base no método da equivalência patrimonial, o investimento é contabilizado no balanço patrimonial ao custo, adicionado das variações após a aquisição da participação societária. A demonstração dos resultados reflete a parcela dos resultados das operações das controladas.

Quando uma mudança for diretamente reconhecida no patrimônio das controladas, a Companhia reconhece sua parcela nas variações ocorridas e divulgará esse fato, quando aplicável, na demonstração das mutações do patrimônio líquido e na demonstração dos resultados abrangentes.

As demonstrações financeiras das controladas são elaboradas para o mesmo período de divulgação da Companhia. Quando necessário, são efetuados ajustes para que as políticas contábeis estejam de acordo com as adotadas pela Companhia.





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Após a aplicação do método da equivalência patrimonial, a Companhia determina se é necessário reconhecer perda adicional do valor recuperável sobre estes investimentos. Anualmente, a Companhia determina se há evidência objetiva de que o investimento sofreu perda por redução ao valor recuperável. Se assim for, a Companhia calcula o montante da perda por redução ao valor recuperável como a diferença entre o valor recuperável e o valor contábil e reconhece o montante na demonstração dos resultados.

Quando ocorrer perda de influência significativa sobre as controladas, a Companhia avalia e reconhece o investimento neste momento a valor justo. Será reconhecida no resultado qualquer diferença entre o valor contábil das investidas no momento da perda de influência significativa e o valor justo do investimento remanescente e resultados da venda.

f) **Imobilizado**

É demonstrado pelo custo de aquisição e/ou construção, líquido da depreciação e da provisão para a redução ao valor recuperável acumulada, se aplicável. O referido custo inclui os custos de empréstimos de projetos de construção de longo prazo, quando os critérios de reconhecimento forem satisfeitos.

Os custos do ativo são capitalizados até o momento em que esteja nas condições previstas para sua entrada em operação. Os gastos subsequentes à entrada do ativo em operação e que não melhora a funcionalidade ou aumenta a vida útil do bem são reconhecidos imediatamente no resultado, respeitando-se o regime de competência. Quando partes significativas do ativo imobilizado são substituídas, essas partes são reconhecidas como ativo individual com vida útil e depreciação específica. Da mesma forma, gastos que representem melhorias no ativo (aumento da capacidade instalada ou da vida útil) são capitalizados. Todos os demais custos de reparos e manutenção são reconhecidos na demonstração dos resultados, quando incorridos.

O valor presente dos custos estimados a incorrer na desmontagem de ativo imobilizado (equipamentos em imóveis alugados) é capitalizado no custo do correspondente ativo em contrapartida à provisão para desmantelamento de ativos e depreciados ao longo da vida útil dos equipamentos, a qual não é superior ao prazo de locação.



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A depreciação é calculada de forma linear ao longo da vida útil do ativo, a taxas que levam em consideração a vida útil estimada dos bens baseada em estudos técnicos. O valor residual e vida útil dos ativos e os métodos de depreciação são revisados anualmente, e ajustados de forma prospectiva, quando for o caso.

Um item do imobilizado é baixado quando vendido ou quando nenhum benefício econômico futuro for esperado do seu uso ou venda. Eventual ganho ou perda resultante de baixa do ativo (calculado como sendo a diferença entre o valor líquido da venda e o valor residual do ativo) são reconhecidos no resultado do período em que o ativo for baixado.

g) Intangível

Ativos intangíveis adquiridos separadamente são mensurados ao custo no momento do seu reconhecimento inicial. O custo dos ativos intangíveis adquiridos em uma combinação de negócios corresponde ao valor justo na data da aquisição.

Após o reconhecimento inicial, os ativos intangíveis são demonstrados pelo custo de aquisição e/ou formação, líquido da amortização e da provisão para a redução ao valor recuperável acumulada, se aplicáveis. Ativos intangíveis gerados internamente, excluindo custos de desenvolvimento, não são capitalizados, e o gasto é refletido na demonstração dos resultados no período em que for incorrido.

A vida útil de um ativo intangível é avaliada como definida ou indefinida.

A Companhia possui apenas ativos intangíveis com vida útil definida, que são amortizados ao longo da vida útil econômica pelo método linear e avaliados em relação à perda por redução ao valor recuperável sempre que houver indícios de perda de valor econômico do ativo. O período e o método de amortização para um ativo intangível com vida útil definida são revisados anualmente.

Mudanças na vida útil estimada ou no consumo esperado dos benefícios econômicos futuros desses ativos são contabilizadas por meio de mudanças no período ou no método de amortização, conforme o caso, sendo tratadas como mudanças de estimativas contábeis. A amortização de ativos intangíveis com vida útil definida é reconhecida na demonstração dos resultados na categoria de custo/despesa consistente com a utilização do ativo intangível.

3.º TRIBUNAL DE NOTAS - S. PAULO  
AUTENTICAÇÃO  
Estado de São Paulo - Tribunal de Notas  
Av. BRQ LUIS, 101 - JARDIM - São Paulo - SP

S. Paulo, 09 SET 2018 04:03  
POR: [assinatura] POR: [assinatura]  
[assinatura] [assinatura]



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Ganhos e perdas resultantes da baixa de um ativo intangível são mensurados como diferença entre o valor líquido obtido na venda e o valor contábil do ativo e são reconhecidos na demonstração dos resultados no período em que o ativo for baixado.

**h) Arrendamento mercantil**

A caracterização de um contrato de arrendamento mercantil está baseada em aspectos substantivos relativos ao uso de um ativo ou ativos específicos ou, ainda, ao direito de uso de um determinado ativo, na data do início da sua execução.

A Companhia possui contratos de arrendamento mercantil financeiro como arrendadora, referente a aluguel de equipamentos de informática (Soluciona TI), para os quais reconhece na data de instalação uma receita pelo valor presente das parcelas do contrato em contrapartida nas contas a receber, classificados como arrendamento mercantil financeiro na condição de arrendadora.

A diferença entre o valor nominal das parcelas e as contas a receber registradas é reconhecida como receita financeira com base no método da taxa de juros efetiva de acordo com a duração do contrato.

A Companhia possui contratos de arrendamento mercantil operacional, em que o arrendador não transfere parte significativa dos riscos e benefícios, sendo seus efeitos reconhecidos no resultado do período ao longo do prazo contratual.

**i) Análise de recuperabilidade dos ativos, não financeiros**

Anualmente, a Companhia revisa o valor contábil líquido dos ativos com o objetivo de avaliar eventos ou mudanças nas circunstâncias econômicas, operacionais ou tecnológicas que possam indicar deterioração ou perda de seu valor recuperável. Sendo tais evidências identificadas e tendo o valor contábil líquido excedido o valor recuperável, é constituída provisão para desvalorização ajustando o valor contábil líquido ao valor recuperável.

O valor líquido de venda é determinado, sempre que possível, com base em contrato de venda firme em uma transação em bases comutativas, entre partes conhecedoras e interessadas, ajustado por despesas atribuíveis à venda do ativo, ou, quando não há contrato de venda firme, com base no preço de mercado de um mercado ativo, ou no preço da transação mais recente com ativos semelhantes.

3.º TABELÃO DE NOTAS - S. PAULO  
AUTENTICAÇÃO  
Edição da Silva Resumos - Índice Inteiro  
Av. SÃO LUIS, 102 L. 2101 - Tel. (11) 3740-6644

09 SET. 2018

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As perdas em operações continuadas são reconhecidas na demonstração dos resultados em contas de despesas compatíveis com a função dos ativos.

Anualmente é efetuada uma avaliação dos ativos para identificar se há alguma indicação de que as perdas do valor recuperável anteriormente reconhecidas podem já não existir ou possam ter diminuído.

Uma perda do valor recuperável anteriormente reconhecida é revertida apenas se tiver ocorrido uma mudança nos pressupostos utilizados para determinar o valor recuperável do ativo, desde quando a última perda do valor recuperável foi reconhecida.

A reversão é limitada para que o valor contábil do ativo não exceda o seu valor recuperável, nem o valor contábil que teria sido determinado, líquido de depreciação, se nenhuma perda do valor recuperável tivesse sido reconhecida no ativo em exercícios anteriores. Essa reversão é reconhecida na demonstração dos resultados, caso aplicável.

Avaliação do valor em uso: as principais premissas usadas na estimativa do valor em uso são: (i) receitas (projetadas considerando o crescimento da base de clientes, a evolução das receitas do mercado frente ao PIB e a participação da Companhia neste mercado); (ii) custos e despesas variáveis (projetados de acordo com a dinâmica da base de clientes, e os custos fixos são projetados em linha com o desempenho histórico da Companhia, bem como com o crescimento histórico das receitas); e (iii) investimentos de capital (estimados considerando a infraestrutura tecnológica necessária para viabilizar a oferta dos serviços).

As premissas chave são baseadas no desempenho histórico da Companhia e em premissas macroeconômicas razoáveis e fundamentadas com base em projeções do mercado financeiro, documentadas e aprovadas pela Administração da Companhia.

Os testes de recuperação dos ativos imobilizados e intangíveis da Companhia não resultaram na necessidade de reconhecimento de perdas para o período findo em 30 de setembro de 2018, visto que o valor recuperável excede o seu valor líquido contábil na data de avaliação.



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j) Instrumentos financeiros

Os ativos e passivos financeiros devem inicialmente ser valorados pelo seu valor justo. Os critérios para determinar o valor justo dos ativos e passivos financeiros foram (i) o preço cotado em um mercado ativo ou, na ausência deste e (ii) a utilização de técnicas de avaliação que permitam estimar o valor justo na data da transação levando-se em consideração o valor que seria negociado entre partes independentes, conhecedoras da transação e com interesse em realizá-la.

A mensuração posterior de ativos e passivos financeiros segue o método do valor justo ou do custo amortizado, conforme a categoria. O custo amortizado corresponde: (i) ao valor reconhecido inicialmente para o ativo ou passivo financeiro; (ii) menos as amortizações de principal; e (iii) mais/menos juros acumulados pelo método da taxa de juros efetiva.

Os efeitos da mensuração posterior dos ativos e passivos financeiros são alocados diretamente ao resultado do período.

Ativos e passivos de longo prazo com características de instrumentos financeiros são registrados inicialmente pelo seu valor presente.

k) Mensuração do valor justo

Anualmente, a Companhia mensura os instrumentos financeiros e ativos não financeiros a valor justo.

Valor justo é o preço que seria recebido pela venda de um ativo ou pago pela transferência de um passivo em uma transação não forçada entre participantes do mercado na data de mensuração. A mensuração do valor justo é baseada na presunção de que a transação para vender o ativo ou transferir o passivo ocorrerá (i) no mercado principal para o ativo ou passivo; ou (ii) na ausência de um mercado principal, no mercado mais vantajoso para o ativo ou o passivo.

O mercado principal ou mais vantajoso deve ser acessível à Companhia.

O valor justo de um ativo ou passivo é mensurado com base nas premissas que os participantes do mercado utilizariam ao definir o preço de um ativo ou passivo, presumindo que os participantes do mercado atuam em seu melhor interesse econômico.



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A mensuração do valor justo de um ativo não financeiro leva em consideração a capacidade de um participante do mercado gerar benefícios econômicos por meio da utilização ideal do ativo ou vendendo-o a outro participante do mercado que também utilizaria o ativo de forma ideal.

A Companhia utiliza técnicas de avaliação adequadas nas circunstâncias e para as quais haja dados suficientes para mensuração do valor justo, maximizando o uso de informações disponíveis pertinentes e minimizando o uso de informações não disponíveis.

Anualmente, para ativos e passivos reconhecidos nas demonstrações financeiras de forma recorrente, a Companhia determina se ocorreram transferências entre níveis da hierarquia, reavaliando a categorização (com base na informação de nível mais baixo e significativo para mensuração do valor justo como um todo).

Para fins de divulgações do valor justo, a Companhia determinou classes de ativos e passivos com base na natureza, características e riscos do ativo ou passivo e o nível da hierarquia do valor justo, conforme descrito anteriormente.

No decorrer do período findo em 30 de setembro de 2018, não houve transferências entre avaliações de valor justo de Nível 3 e Níveis 1 e 2.

I) Provisões

I.1) Geral

As provisões são reconhecidas quando há uma obrigação presente (legal ou não formalizada) em consequência de um evento passado, que é provável que uma saída de recursos envolvendo benefícios econômicos seja necessária para liquidar a obrigação e uma estimativa razoável do montante dessa obrigação possa ser efetuada. As provisões são atualizadas até a data do encerramento do período pelo montante provável da perda, observada a natureza de cada contingência.

As provisões para demandas judiciais estão apresentadas pelo seu montante bruto, sem considerar os correspondentes depósitos judiciais e são classificadas como cíveis, trabalhistas e tributárias.

Os depósitos judiciais estão classificados como ativo, dado que não existem as condições requeridas para apresentá-los líquidos com a provisão.



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**1.2) Provisões para demandas judiciais cíveis, trabalhistas e tributárias**

A Companhia é parte em demandas administrativas e judiciais de natureza trabalhista, tributária, cível e regulatória, tendo sido constituída provisão contábil em relação às demandas cuja probabilidade de perda foi classificada como provável. A avaliação da probabilidade de perda inclui a avaliação das evidências disponíveis, a hierarquia das leis, as jurisprudências disponíveis, as decisões mais recentes nos tribunais e sua relevância no ordenamento jurídico, bem como as opiniões de seus consultores jurídicos. As provisões são revisadas e ajustadas para levar em conta alterações nas circunstâncias, tais como prazo de prescrição aplicável, conclusões de inspeções fiscais ou exposições adicionais identificadas com base em novos assuntos ou decisões de tribunais.

**1.3) Provisão para desmantelamento de ativos**

Referem-se aos custos a serem incorridos pela necessidade de ter que devolver os sites (localidades destinadas a instalações de equipamentos em imóveis alugados) aos proprietários nas mesmas condições em que se encontravam quando da assinatura do contrato inicial de locação.

Estes custos são provisionados com base no valor presente dos custos esperados para liquidar a obrigação utilizando fluxos de caixa estimados, sendo reconhecidos como parte do custo do correspondente ativo.

Os fluxos de caixa são descontados a uma taxa antes de imposto corrente que reflete os riscos específicos inerentes à obrigação por desativação de ativos. O efeito financeiro do desconto é contabilizado em despesa conforme incorrido e reconhecido na demonstração dos resultados como um custo financeiro. Os custos futuros estimados de desativação de ativos são revisados anualmente e ajustados, conforme o caso. Mudanças nos custos futuros estimados ou na taxa de desconto aplicada são adicionadas ou deduzidas do custo do ativo.

**m) Tributos**

**m.1) Tributos correntes**

Ativos e passivos tributários correntes do último exercício e de exercícios anteriores são mensurados ao valor que se espera recuperar ou pagar às autoridades tributárias. As alíquotas e a legislação tributária utilizadas no cálculo dos mencionados montantes são aquelas que estão em vigor ou substancialmente em vigor na data do encerramento do período. No balanço patrimonial os tributos correntes são apresentados líquidos dos valores recolhidos por antecipação ao longo do exercício.



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Imposto de renda e contribuição social correntes relativos a itens reconhecidos diretamente no patrimônio líquido são reconhecidos no patrimônio líquido. A Administração periodicamente avalia a posição fiscal das situações nas quais a regulamentação fiscal requer interpretação e estabelece provisões quando apropriado.

## m.2) Tributos diferidos

O valor dos tributos diferidos é gerado por diferenças temporárias na data do encerramento do período, entre as bases fiscais de ativos e passivos e seus valores contábeis.

Tributos diferidos ativos são reconhecidos para todas as diferenças temporárias dedutíveis, créditos e perdas tributárias não utilizados, na extensão em que seja provável que o lucro tributável esteja disponível para que as diferenças temporárias dedutíveis possam ser realizadas, e créditos e perdas tributárias não utilizados possam ser utilizados, exceto: (i) quando o tributo diferido ativo relacionado com a diferença temporária dedutível é gerado no reconhecimento inicial do ativo ou passivo em uma transação que não é uma combinação de negócios e, na data da transação, não afeta o lucro contábil ou o lucro ou prejuízo fiscal; e (ii) sobre as diferenças temporárias dedutíveis associadas com investimentos em controladas, impostos diferidos ativos são reconhecidos somente na extensão em que for provável que as diferenças temporárias sejam revertidas no futuro próximo e o lucro tributável esteja disponível para que as diferenças temporárias possam ser utilizadas.

O valor contábil dos tributos diferidos ativos é revisado em cada data do encerramento do período e baixado na extensão em que não é mais provável que lucros tributáveis estarão disponíveis para permitir que todo ou parte do ativo tributário diferido venha a ser utilizado. Tributos diferidos ativos baixados são revisados a cada data de encerramento do período e são reconhecidos na extensão em que se torna provável que lucros tributáveis futuros permitirão que os ativos tributários diferidos sejam recuperados.

Tributos diferidos passivos são reconhecidos para todas as diferenças tributárias temporárias, exceto: (i) quando o tributo diferido passivo surge do reconhecimento inicial de ágio ou de um ativo ou passivo em uma transação que não for uma combinação de negócios e, na data da transação, não afeta o lucro contábil ou o lucro ou prejuízo fiscal; e (ii) sobre as diferenças temporárias tributárias relacionadas com investimentos em controladas, em que o período da reversão das diferenças temporárias pode ser controlado e é provável que as diferenças temporárias não sejam revertidas no futuro próximo.





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Tributos diferidos ativos e passivos são mensurados à alíquota de tributo que é esperada de ser aplicável no ano em que o ativo será realizado ou o passivo liquidado, com base nas alíquotas previstas na legislação tributária e que foram promulgadas na data do encerramento do período.

Os ativos e passivos fiscais diferidos não são descontados a valor presente e são classificados no balanço patrimonial como não circulantes, independentemente da expectativa de realização.

Os efeitos fiscais de itens registrados diretamente no patrimônio líquido são reconhecidos igualmente no patrimônio líquido. Itens de tributo diferido são reconhecidos de acordo com a transação que originou o tributo diferido, no resultado abrangente ou diretamente no patrimônio líquido.

Tributos diferidos ativos e passivos são apresentados líquidos se existe um direito legal ou contratual para compensar o ativo fiscal contra o passivo fiscal e os impostos diferidos são relacionados à mesma entidade tributada e sujeitos à mesma autoridade tributária.

n) Planos de previdência e outros benefícios pós-emprego

A Companhia patrocina individualmente planos de aposentadoria para empregados ativos e aposentados. As contribuições são determinadas em bases atuariais e são registradas pelo regime de competência. Anualmente, os planos de benefícios são avaliados atuarialmente, a fim de verificar se as taxas de contribuição estão sendo suficientes para formar a reserva necessária para ambos os compromissos atuais e futuros.

Os passivos atuariais de planos com características de benefício definido foram calculados adotando-se o método de crédito unitário projetado. Os ganhos e perdas atuariais são reconhecidos de forma imediata no patrimônio líquido (em outros resultados abrangentes).

Para os planos com características de contribuição definida, a obrigação é limitada ao pagamento das contribuições, as quais são reconhecidas no resultado nos respectivos períodos de competência.



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O ativo ou passivo de plano de benefício definido a ser reconhecido nas demonstrações financeiras corresponde ao valor presente da obrigação pelo benefício definido (utilizando uma taxa de desconto com base em títulos de longo prazo do Governo Federal - NTNs), deduzido do valor justo dos ativos do plano que serão usados para liquidar as obrigações. Os ativos do plano são ativos mantidos por uma entidade fechada de previdência complementar. Os ativos do plano não estão disponíveis aos credores da Companhia e não podem ser pagos diretamente a Companhia. O valor justo se baseia em informações sobre preço de mercado e, no caso de títulos cotados, no preço de compra publicado. O valor de qualquer ativo de benefício definido reconhecido é limitado ao valor presente de qualquer benefício econômico disponível na forma de redução nas contribuições patronais futuras do plano.

Com a adoção do CPC 33 (Revisado) em 1º de janeiro de 2013, os custos atuariais reconhecidos na demonstração do resultado são limitados ao custo do serviço e custo de juros sobre a obrigação do plano de benefício definido. Qualquer mudança na mensuração nos ativos e obrigações dos planos é inicialmente reconhecida em outros resultados abrangentes e imediatamente reclassificada permanentemente para o resultado.

## o) Participação dos empregados nos resultados

A Companhia tem obrigações decorrentes dos contratos de trabalhos com seus empregados, reconhecendo estas provisões durante o período. São registradas provisões para reconhecer a despesa referente à participação dos empregados nos resultados.

Estas provisões são calculadas com base em metas qualitativas e quantitativas definidas pela Administração e contabilizadas em contas específicas de acordo com a função nos grupos de Custos dos Serviços Prestados, Despesas com Comercialização e Despesas Gerais e Administrativas.

## p) Outros ativos e passivos

Um ativo é reconhecido no balanço quando for provável que seus benefícios econômicos futuros serão gerados em favor da Companhia e seu custo puder ser mensurado com segurança.

Um passivo é reconhecido no balanço quando a Companhia possui uma obrigação legal ou constituída como resultado de um evento passado, sendo provável que um recurso econômico seja requerido para liquidá-lo.



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Os ativos e passivos são apresentados no balanço patrimonial com base na classificação circulante ou não circulante.

Um ativo é classificado no circulante quando: (i) espera-se realizá-lo ou se pretende vendê-lo ou consumi-lo no ciclo operacional normal; (ii) for mantido principalmente para negociação; (iii) espera-se realizá-lo dentro de 12 meses após o período de divulgação; ou (iv) caixa ou equivalentes de caixa, a menos que haja restrições quanto à sua troca ou seja utilizado para liquidar um passivo por, pelo menos, 12 meses após o período de divulgação. Todos os demais ativos são classificados como não circulantes.

Um passivo é classificado no circulante quando: (i) espera-se liquidá-lo no ciclo operacional normal; (ii) for mantido principalmente para negociação; (iii) espera-se liquidá-lo dentro de 12 meses após o período de divulgação; ou (iv) não há direito incondicional para diferir a liquidação do passivo por, pelo menos, 12 meses após o período de divulgação. Todos os demais passivos são classificados como não circulantes.

q) **Saldos e transações em moeda estrangeira**

Os ativos e passivos monetários denominados em moeda estrangeira são convertidos para a moeda funcional (o Real) usando-se a taxa de câmbio (Ptax) na data da transação e convertidos subsequentemente usando a Ptax na data das demonstrações financeiras. Os ganhos e perdas resultantes da conversão desses ativos e passivos verificados entre a taxa de câmbio vigente na data da transação e os encerramentos dos períodos são reconhecidos na demonstração do resultado.

r) **Ajuste a valor presente de ativos e passivos**

Os ativos e passivos monetários circulantes e não circulantes são ajustados pelo seu valor presente, quando o efeito é considerado relevante em relação às demonstrações financeiras tomadas em conjunto. O ajuste a valor presente é calculado levando em consideração os fluxos de caixa contratuais e a taxa de juros explícita, e em certos casos implícita, dos respectivos ativos e passivos.



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Dessa forma, os juros embutidos nas receitas, as despesas e os custos associados a esses ativos e passivos são descontados com o intuito de reconhecê-los em conformidade com o regime de competência. Posteriormente, esses juros são realocados no resultado financeiro na demonstração dos resultados por meio da utilização do método da taxa efetiva de juros em relação aos fluxos de caixa contratuais. As taxas de juros implícitas aplicadas foram determinadas com base em premissas e são consideradas estimativas contábeis.

s) **Julgamentos, estimativas e premissas contábeis significativas**

A preparação das demonstrações financeiras requer que a Administração faça julgamentos e estimativas e adote premissas com apoio em diversas bases de avaliação utilizadas nas estimativas contábeis. As estimativas contábeis envolvidas na preparação das demonstrações financeiras foram apoiadas em fatores objetivos e subjetivos, com base no julgamento da Administração para determinação do valor adequado a ser registrado nas demonstrações financeiras.

Contudo, a incerteza relativa envolvendo essas estimativas poderá resultar em valores significativamente divergentes dos registrados nas demonstrações financeiras devido aos critérios inerentes ao processo de estimativas.

As principais premissas relativas a fontes de incerteza nas estimativas futuras e outras importantes fontes de incerteza em estimativas na data do encerramento do período, envolvendo risco significativo de causar um ajuste significativo no valor contábil dos ativos e passivos, são descritas a seguir:

s.1) **Perda por redução ao valor recuperável de ativos não financeiros**

Uma perda por redução ao valor recuperável existe quando o valor contábil de um ativo ou unidade geradora de caixa excede o seu valor recuperável, o qual é o maior entre o valor justo menos custos de venda e o valor em uso. O cálculo do valor justo menos custos de vendas é baseado em informações disponíveis de transações de venda de ativos similares ou preços de mercado menos custos adicionais para descartar o ativo. O cálculo do valor em uso é baseado no modelo de fluxo de caixa descontado. O valor recuperável é sensível à taxa de desconto utilizada no método de fluxo de caixa descontado, bem como os recebimentos de caixa futuros esperados e à taxa de crescimento utilizada para fins de extrapolação.



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s.2) Planos de previdência e outros benefícios pós-emprego

O custo de planos de aposentadoria com benefícios definidos pós-emprego e o valor presente da obrigação de aposentadoria são determinados utilizando métodos de avaliação atuarial. A avaliação atuarial envolve o uso de premissas sobre as taxas de desconto, aumentos salariais futuros, taxas de mortalidade e aumentos futuros de benefícios de aposentadorias e pensões. A obrigação de benefício definido é altamente sensível a mudanças nessas premissas. Todas as premissas são revisadas anualmente.

A taxa de mortalidade se baseia em tábuas de mortalidade disponíveis no país. Aumentos futuros de salários e de benefícios de aposentadoria e de pensão se baseiam nas taxas de inflação futuras esperadas para o país.

s.3) Valor justo de instrumentos financeiros

Quando o valor justo de ativos e passivos financeiros apresentados no balanço patrimonial não puder ser obtido de mercados ativos, é determinado utilizando técnicas de avaliação, incluindo o método de fluxo de caixa descontado. Os dados para esses métodos se baseiam naqueles praticados no mercado, quando possível. Contudo, quando isso não for viável, um determinado nível de julgamento é requerido para estabelecer o valor justo. O julgamento inclui considerações sobre os dados utilizados como, por exemplo, risco de liquidez, risco de crédito e volatilidade. Mudanças nas premissas sobre esses fatores podem afetar o valor justo apresentado nos instrumentos financeiros.

s.4) Ativo imobilizado e intangível de vida útil definida

O tratamento contábil do investimento em ativo imobilizado e intangível inclui a realização de estimativas para determinar o período de vida útil para efeitos de sua depreciação e o valor justo na data de aquisição, em particular para os ativos adquiridos em combinações de negócios.

A determinação das vidas úteis requer estimativas em relação à evolução tecnológica esperada e ao uso alternativo dos ativos. As hipóteses relacionadas ao aspecto tecnológico e seu desenvolvimento futuro implicam em um grau significativo de análise, na medida em que o momento e a natureza das futuras mudanças tecnológicas são de difícil previsão.



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Quando uma desvalorização é identificada no valor dos ativos tangíveis e intangíveis, é registrado um ajuste do valor na demonstração dos resultados do período. A determinação da necessidade de registrar uma perda por desvalorização implica na realização de estimativas que incluem, entre outras, a análise das causas da possível desvalorização, bem como o montante esperado da mesma. São também considerados fatores como a obsolescência tecnológica, a suspensão de determinados serviços e outras mudanças nas circunstâncias que demonstram a necessidade de registrar uma possível desvalorização.

## s.5) Tributos

Existem incertezas com relação à interpretação de regulamentos tributários complexos e ao valor e época de resultados tributáveis futuros. A Companhia constitui provisões, com base em estimativas cabíveis, para eventuais consequências de auditorias por parte das autoridades fiscais das respectivas jurisdições em que opera. O valor dessas provisões baseia-se em vários fatores, como experiência de auditorias fiscais anteriores e interpretações divergentes dos regulamentos tributários pela entidade tributável e pela autoridade fiscal responsável. Essas diferenças de interpretação podem surgir numa ampla variedade de assuntos, dependendo das condições vigentes no respectivo domicílio da Companhia.

A Companhia avalia a recuperabilidade do ativo fiscal diferido com base nas estimativas de resultados futuros. Essa recuperabilidade depende, em última instância, da capacidade da Companhia de gerar lucros tributáveis ao longo do período em que o ativo fiscal diferido é dedutível. Na análise é considerado o calendário previsto de reversão de passivo fiscal diferido, bem como as estimativas de lucros tributáveis, com base em projeções internas atualizadas de modo a refletir as tendências mais recentes.

A determinação da classificação adequada dos itens fiscais depende de vários fatores, incluindo a estimativa do momento e a realização do ativo fiscal diferido e do momento esperado dos pagamentos desses impostos. O fluxo real de entradas e saídas do imposto de renda pode divergir das estimativas realizadas pela Companhia, como consequência de mudanças na legislação fiscal, ou de transações futuras não previstas que possam afetar os saldos fiscais.



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s.6) Provisões para demandas judiciais tributárias, trabalhistas e cíveis

As provisões são reconhecidas quando há uma obrigação presente como consequência de um evento passado, cuja liquidação requer uma saída de recursos que é considerada provável e que pode ser estimada com confiabilidade. Essa obrigação pode ser legal ou tácita, derivada de, entre outros fatores, regulamentações, contratos, práticas habituais ou compromissos públicos que criam perante terceiros uma expectativa válida de que a Companhia assumirá determinadas responsabilidades. A determinação do montante da provisão está baseada na melhor estimativa do desembolso que será necessário para liquidar a obrigação correspondente, tomando em consideração toda a informação disponível na data de encerramento do período, incluída a opinião de peritos independentes, como consultores jurídicos.

4) Patrimônio líquido

a) Capital social

O capital social realizado em 30 de setembro de 2018 era de R\$ 578.114.259,52. O capital subscrito e integralizado está representado por 2.704.122.564 ações ordinárias nominativas e sem valor nominal, todas de propriedade da Telefônica Brasil S.A., controladora e única acionista da Companhia.

Os acionistas poderão deliberar em Assembleia Geral específica sobre a criação de ações preferenciais nominativas sem direito a voto até o limite de dois terços do total das ações emitidas, com as preferências e vantagens que lhes forem atribuídas na emissão, observando o disposto no artigo 253 da Lei n° 6.404/76.





JUCESP PROTOCOLO  
0.596.344/16-8



**TELEFÔNICA BRASIL S.A.**

Companhia Aberta

CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

**ATA DA 297ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

1. **DATA, HORA e LOCAL:** 10 de junho de 2016, às 08:00, realizada na sede social da Telefônica Brasil S.A. ("Companhia"), na Avenida Engenheiro Luiz Carlos Berrini, 1376, Bairro Cidade Monções, Cidade de São Paulo, Estado de São Paulo.

2. **CONVOCAÇÃO e PRESENÇA:** Dispensada a convocação, tendo em vista a presença de todos os membros do Conselho de Administração, os quais subscrevem esta ata, conforme disposto no artigo 19, parágrafo 4º do Estatuto Social da Companhia.

3. **MESA:** Eduardo Navarro de Carvalho – Presidente da Reunião e Breno Rodrigo Pacheco de Oliveira - Secretário da Reunião.

**4. DELIBERAÇÕES:**

4.1. **NOMEAÇÃO DO PRESIDENTE DO CONSELHO:** Nos termos do artigo 14, parágrafo único, do Estatuto Social da Companhia, foi aprovada a nomeação do Conselheiro, Sr. **Eduardo Navarro de Carvalho**, brasileiro, solteiro, engenheiro, portador da Cédula de Identidade RG nº 52.558.558-8 SSP/SP, inscrito no CPF/MF sob nº 531.710.556-00, residente e domiciliado em Madrid, Espanha, com endereço comercial à Ronda de la Comunicación s/nº, Edifício Central, 1ª Planta, na Cidade de Madrid, Espanha, 28050, como Presidente do Conselho de Administração da Companhia, para o novo mandato que se encerrará na data da Assembleia Geral Ordinária da Companhia a ser realizada no ano de 2019.

4.2. **ELEIÇÃO DOS MEMBROS DOS COMITÊS:** Os seguintes Conselheiros foram eleitos para compor os Comitês que auxiliam o Conselho de Administração da Companhia para o novo mandato que se encerrará juntamente com os seus respectivos mandatos de membros do Conselho de Administração da Companhia:

Ata da 297ª RC nº 1/5

3º TABELÃO DE NOTAS - SP, PAUL. L.  
AUTENTICAÇÃO  
Eduardo de São Francisco - Tabelião Público  
R. São Luís, 110 - 2024 - Tel. (11) 4130-6624  
10 SET, 2019  
SELOS POR VERSA  
AUTENTICAÇÃO  
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AUTENTICAÇÃO  
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TELEFÔNICA BRASIL S.A.  
Companhia Aberta  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

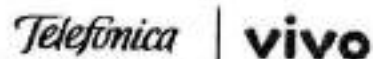
**ATA DA 297ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

- (i) Comitê de Auditoria e Controle: Sr. Luis Francisco Javier Bastida Iburgüen, espanhol, casado, licenciado em ciências empresariais, portador do Passaporte nº AAH274604, residente e domiciliado em Madrid, Espanha, com endereço comercial em Gran Via, 28 - 12ª Planta, na Cidade de Madrid, Espanha, 28013, na qualidade de Presidente do Comitê; Sr. Narcís Serra Serra, espanhol, casado, economista, portador do Passaporte nº AAH407154, residente e domiciliado em Barcelona, Espanha, com endereço comercial na Calle Ramon Trias Fargas nº 25-27, Campus de la Ciutadella, na Cidade de Barcelona, Espanha, 08005, e Sr. Antonio Gonçalves de Oliveira, brasileiro, casado, sociólogo, portador da carteira de identidade RG 3.074.227-4, inscrito no CPF/MF sob nº 050.148.678-04, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936; na qualidade de membros do Comitê;
- (ii) Comitê de Nomeações, Vencimentos e de Governança Corporativa: Sr. Francisco Javier de Paz Mancho, espanhol, casado, publicitário, portador do Passaporte nº AAC678025, residente e domiciliado em Madrid, Espanha, com endereço comercial na Ronda de la Comunicación, s/nº, Edifício Central A, 1ª Planta, na Cidade de Madrid, Espanha, 28050, na qualidade de Presidente do Comitê; Sr. Amos Genish, israelense, casado, economista, portador do RNE nº V305047-D (CGPI/DIREX/DPF), inscrito no CPF/MF sob o nº 009.194.169-50, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, e Sr. Luis Francisco Javier Bastida Iburgüen, anteriormente qualificado, na qualidade de membros do Comitê; e

3.º TABELÃO DE NOTAS - S. PAULO  
AUTENTICAÇÃO  
Edifício da Siba Resumida - Tabelão Interino  
Av. BAO LUNE, 157 L. 2326 - Tel. (11) 3120-4600

Ata da 297ª RC/2015





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Companhia Aberta  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

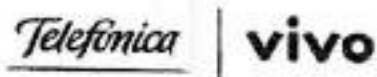
**ATA DA 297ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

(iii) Comitê de Qualidade do Serviço e Atenção Comercial: Sr. **Antonio Carlos Valente da Silva**, brasileiro, casado, engenheiro elétrico, portador da cédula de identidade CREA RJ nº 31.547-D, inscrito no CPF/MF sob nº 371.560.557-04, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, na qualidade de Presidente do Comitê; Sr. **Roberto Oliveira de Lima**, brasileiro, divorciado, administrador de empresas, portador da carteira de identidade RG 4.455.053-4, inscrito no CPF/MF sob nº 860.196.518-00, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936 e Sra. **Sonia Julia Suizbeck Villalobos**, brasileira, casada, administradora de empresas, portadora da Cédula de Identidade RG nº 8.417.132-7 SSP/SP, inscrita no CPF/MF sob o nº 022.306.678-82, residente e domiciliada na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Estrada Carlos Queiroz Telles, 100, Apto. 101 – CEP 05704-150, na qualidade de membros do Comitê.

**4.3. NOMEAÇÃO DO SECRETÁRIO-GERAL DO CONSELHO:** Foi aprovada a nomeação do Sr. **Breno Rodrigo Pacheco de Oliveira**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS sob o nº 45.479, inscrito no CPF/MF sob o nº 711.936.930-04, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, como Secretário-Geral do Conselho de Administração da Companhia, para o novo mandato que se encerrará na data da Assembleia Geral Ordinária da Companhia a ser realizada no ano de 2019.



Ata da 297ª RCA Fl. 3



**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

**ATA DA 297ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

**4.4. ELEIÇÃO DA DIRETORIA:** Foram reeleitos os membros da Diretoria da Companhia, para novo mandato que tem início nesta data e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após a Assembleia Geral Ordinária do ano 2019, conforme segue:

- (i) Diretor Presidente: Sr. **Amos Genish**, acima qualificado;
- (ii) Diretor de Finanças, Recursos Corporativos e de Relações com Investidores: Sr. **David Melcon Sanchez-Friera**, espanhol, casado, economista, portador do RNE nº G240737-5, inscrito no CPF/MF sob o nº 238.558.708-45, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936; e
- (iii) Secretário Geral e Diretor Jurídico: Sr. **Breno Rodrigo Pacheco de Oliveira**, acima qualificado.

Os Diretores ora reeleitos informaram que não se encontravam incursos nos impedimentos legais para o exercício dos respectivos cargos e que estavam em condições de firmar a declaração de desimpedimento de que trata o art. 147 da Lei nº 6.404/1976 e a Instrução CVM 367/2002. Os referidos Diretores serão investidos em seus respectivos cargos mediante assinatura de seus respectivos termos de posse e de desimpedimento, que ficarão arquivados na sede social da Companhia.



Ata da 297ª RCF

TELEFÔNICA | vivo

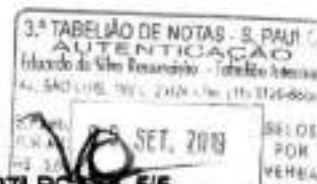
**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

**ATA DA 297ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

Nada mais havendo a tratar, foi encerrada a reunião e lavrada a presente ata pelo Secretário do Conselho, a qual foi aprovada e assinada pelos Conselheiros presentes, passando a constar do livro próprio. São Paulo, 10 de junho de 2016. (aa) Eduardo Navarro de Carvalho – Presidente da Reunião; Amos Genish; Ángel Vilá Boix; Antonio Gonçalves de Oliveira; Sonia Julia Sulzbeck Villalobos; Francisco Javier de Paz Mancho; Luis Francisco Javier Bastida Ibarguen; Luiz Fernando Furlan; Narcís Serra Serra; Ramiro Sánchez de Larín Garcia-Ovies; Roberto Oliveira de Lima e Antonio Carlos Valente da Silva. Secretário do Conselho de Administração: Breno Rodrigo Pacheco de Oliveira.

Certifico que a presente é cópia fiel da ata da 297ª reunião do Conselho de Administração da Companhia, realizada em 10 de junho de 2016, lavrada em livro próprio.

**Breno Rodrigo Pacheco de Oliveira**  
Secretário do Conselho de Administração



Ata da 297ª RC 5/5



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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### DECLARAÇÃO DE DESIMPEDIMENTO

Para os efeitos do disposto no § 4º do art. 147 da Lei nº 6.404/76 e da Instrução CVM nº 367/2002, eu, **Breno Rodrigo Pacheco de Oliveira**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS sob o nº 45.479, inscrito no CPF/MF sob o nº 711.936.930-04, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, declaro: (i) não estar impedido por lei especial, ou condenado por crime falimentar, de prevaricação, peita ou suborno, concussão, peculato, contra a economia popular, a fé pública, ou a propriedade, ou a pena criminal que vede, ainda que temporariamente, o acesso a cargos públicos, como previsto no § 1º do artigo 147 da Lei nº 6.404/76; (ii) não estar condenado a pena de suspensão ou inabilitação temporária aplicada pela Comissão de Valores Mobiliários, que me torne inelegível para os cargos de administração de companhia aberta, como estabelecido no § 2º do artigo 147 da Lei nº 6.404/76; (iii) atender ao requisito de reputação ilibada estabelecido pelo § 3º do artigo 147 da Lei nº 6.404/76; (iv) não ocupar cargo em sociedade que possa ser considerada concorrente da Companhia, e não tem, nem representa, interesse conflitante com o da Companhia, na forma dos incisos I e II do § 3º do artigo 147 da Lei nº 6.404/76.

São Paulo, 10 de junho de 2016.

**Breno Rodrigo Pacheco de Oliveira**



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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### TERMO DE POSSE

Eu, **Breno Rodrigo Pacheco de Oliveira**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS sob o nº 45.479, inscrito no CPF/MF sob o nº 711.936.930-04, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, atendendo à deliberação da 297ª Reunião do Conselho de Administração da Telefônica Brasil S.A., sociedade por ações, com sede localizada na Av. Engenheiro Luiz Carlos Berrini, nº 1376, CEP 04571-936, Cidade de São Paulo, Estado de São Paulo, inscrita no CNPJ/MF sob nº 02.558.157/0001-62 ("Companhia"), realizada no dia 10 de junho do corrente ano, declaro, neste ato, aceitar o cargo de **Secretário Geral e Diretor Jurídico**, com mandato que se inicia nesta data e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após Assembleia Geral Ordinária a ser realizada no ano de 2019, pelo que será lavrado o presente Termo de Posse, para que surta os devidos efeitos legais, ficando assim investido em todos os direitos e obrigações que conferem a Lei e o Estatuto Social da Companhia, e declaro e ratifico, sob as penas da Lei, não me encontrar incurso nos impedimentos legais, inclusive aqueles mencionados no artigo 147 da Lei nº 6.404/76, para o exercício do cargo para o qual fui eleito.

São Paulo, 10 de junho de 2016.

**Breno Rodrigo Pacheco de Oliveira**



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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### TERMO DE POSSE

Eu, **Amos Genish**, israelense, casado, economista, portador da Cédula de Identidade RNE nº V305047-D (CGPI/DIREX/DPF) e inscrito no CPF/MF sob o nº 009.194.169-50, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, nº 1376, 32º andar, CEP 04571-936, Cidade de São Paulo, Estado de São Paulo, atendendo à deliberação da 297ª Reunião do Conselho de Administração da Telefônica Brasil S.A., sociedade por ações, com sede localizada na Av. Engenheiro Luiz Carlos Berrini, nº 1376, CEP 04571-936, Cidade de São Paulo, Estado de São Paulo, inscrita no CNPJ/MF sob nº 02.558.157/0001-62 ("Companhia"), realizada no dia 10 de junho do corrente ano, declaro, neste ato, aceitar o cargo de **Diretor Presidente**, com mandato que se inicia nesta data e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após Assembleia Geral Ordinária a ser realizada no ano de 2019, pelo que será lavrado o presente Termo de Posse, para que surta os devidos efeitos legais, ficando assim investido em todos os direitos e obrigações que conferem a Lei e o Estatuto Social da Companhia, e declaro e ratifico, sob as penas da Lei, não me encontrar incurso nos impedimentos legais, inclusive aqueles mencionados no artigo 147 da Lei nº 6.404/76, para o exercício do cargo para o qual fui eleito.

São Paulo, 10 de junho de 2016.



**Amos Genish**



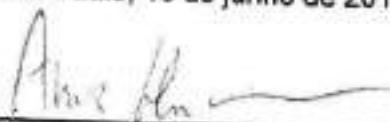
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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### DECLARAÇÃO DE DESIMPEDIMENTO

Para os efeitos do disposto no § 4º do art. 147 da Lei nº 6.404/76 e da Instrução CVM nº 367/2002, eu, **Amos Genish**, israelense, casado, economista, portador da Cédula de Identidade RNE nº V305047-D (CGPI/DIREX/DPF) e inscrito no CPF/MF sob o nº 009.194.169-50, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, nº 1376, 32º andar, CEP 04571-936, Cidade de São Paulo, Estado de São Paulo, declaro: (i) não estar impedido por lei especial, ou condenado por crime falimentar, de prevaricação, peita ou suborno, concussão, peculato, contra a economia popular, a fé pública, ou a propriedade, ou a pena criminal que vede, ainda que temporariamente, o acesso a cargos públicos, como previsto no § 1º do artigo 147 da Lei nº 6.404/76; (ii) não estar condenado a pena de suspensão ou inabilitação temporária aplicada pela Comissão de Valores Mobiliários, que me torne inelegível para os cargos de administração de companhia aberta, como estabelecido no § 2º do artigo 147 da Lei nº 6.404/76; (iii) atender ao requisito de reputação ilibada estabelecido pelo § 3º do artigo 147 da Lei nº 6.404/76; (iv) não ocupar cargo em sociedade que possa ser considerada concorrente da Companhia, e não tem, nem representa, interesse conflitante com o da Companhia, na forma dos incisos I e II do § 3º do artigo 147 da Lei nº 6.404/76.

São Paulo, 10 de junho de 2016.



**Amos Genish**





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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### TERMO DE POSSE

Eu, **David Melcon Sanchez-Friera**, espanhol, casado, economista, portador do RNE nº G240737-5, inscrito no CPF/MF sob o nº 238.558.708-45, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, atendendo à deliberação da 297ª Reunião do Conselho de Administração da Telefônica Brasil S.A., sociedade por ações, com sede localizada na Av. Engenheiro Luiz Carlos Berrini, nº 1376, CEP 04571-936, Cidade de São Paulo, Estado de São Paulo, inscrita no CNPJ/MF sob nº 02.558.157/0001-62 ("Companhia"), realizada no dia 10 de junho do corrente ano, declaro, neste ato, aceitar o cargo de **Diretor de Finanças, Recursos Corporativos e de Relações com Investidores**, com mandato que se inicia nesta data e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após Assembleia Geral Ordinária a ser realizada no ano de 2019, pelo que será lavrado o presente Termo de Posse, para que surta os devidos efeitos legais, ficando assim investido em todos os direitos e obrigações que conferem a Lei e o Estatuto Social da Companhia, e declaro e ratifico, sob as penas da Lei, não me encontrar incurso nos impedimentos legais, inclusive aqueles mencionados no artigo 147 da Lei nº 6.404/76, para o exercício do cargo para o qual fui eleito.

São Paulo, 10 de junho de 2016.



**David Melcon Sanchez-Friera**



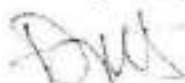
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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

### DECLARAÇÃO DE DESIMPEDIMENTO

Para os efeitos do disposto no § 4º do art. 147 da Lei nº 6.404/76 e da Instrução CVM nº 367/2002, eu, **David Melcon Sanchez-Friera**, espanhol, casado, economista, portador do RNE nº G240737-5, inscrito no CPF/MF sob o nº 238.558.708-45, residente e domiciliado na Cidade de São Paulo, Estado de São Paulo, com endereço comercial na Avenida Engenheiro Luiz Carlos Berrini, 1376, 32º andar, na Cidade de São Paulo, Estado de São Paulo, CEP 04571-936, declaro: (i) não estar impedido por lei especial, ou condenado por crime falimentar, de prevaricação, peita ou suborno, concussão, peculato, contra a economia popular, a fé pública, ou a propriedade, ou a pena criminal que vede, ainda que temporariamente, o acesso a cargos públicos, como previsto no § 1º do artigo 147 da Lei nº 6.404/76; (ii) não estar condenado a pena de suspensão ou inabilitação temporária aplicada pela Comissão de Valores Mobiliários, que me torne inelegível para os cargos de administração de companhia aberta, como estabelecido no § 2º do artigo 147 da Lei nº 6.404/76; (iii) atender ao requisito de reputação ilibada estabelecido pelo § 3º do artigo 147 da Lei nº 6.404/76; (iv) não ocupar cargo em sociedade que possa ser considerada concorrente da Companhia, e não tem, nem representa, interesse conflitante com o da Companhia, na forma dos incisos I e II do § 3º do artigo 147 da Lei nº 6.404/76.

São Paulo, 10 de junho de 2016.



**David Melcon Sanchez-Friera**



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*Telefônica*

TELEFÔNICA BRASIL S.A.

Companhia Aberta

CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

**ATA DA 344ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

1. **DATA, HORA e LOCAL:** Aos 12 de dezembro de 2018, às 17:00hs, realizada na sede social da Telefônica Brasil S.A. ("Companhia"), na Avenida Engenheiro Luiz Carlos Berrini, 1376, Bairro Cidade Monções, Cidade de São Paulo, Estado de São Paulo.
2. **CONVOCAÇÃO e PRESENÇA:** Foi realizada convocação na forma do Estatuto Social da Companhia. Presentes os membros do Conselho de Administração da Companhia, que subscrevem esta ata, havendo, portanto, quórum nos termos do Estatuto Social. O conselheiro de administração Sr. Narcís Serra Serra foi representado pelo Presidente do Conselho, Sr. Eduardo Navarro de Carvalho, por delegação de voto. Ainda estava presente o Secretário Geral e Diretor Jurídico, Sr. Breno Rodrigo Pacheco de Oliveira.
3. **MESA:** Eduardo Navarro de Carvalho – Presidente da Reunião e Breno Rodrigo Pacheco de Oliveira - Secretário da Reunião.
4. **EXPOSIÇÕES E DELIBERAÇÕES:**
  - 4.1. Foi aprovada a eleição do Sr. **Christian Mauad Gebara**, brasileiro, casado, administrador de empresas, portador da Cédula de Identidade nº 15.548.716-4 expedida pela SSP/SP, inscrito no CPF/MF sob nº 203.838.628-50, residente e domiciliado na cidade de São Paulo, Estado de São Paulo, com endereço comercial na Av. Eng. Luiz Carlos Berrini, nº 1376, Bairro Cidade Monções, CEP 04571-936, para o cargo de **Diretor Presidente** da Companhia, em substituição ao Sr. **Eduardo Navarro de Carvalho**. O mandato do Diretor Presidente ora eleito se iniciará em 1º de janeiro de 2019, em complementação ao mandato em curso, e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após a Assembleia Geral

Ata da 344ª RCA FL 1/3



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TELEFÔNICA BRASIL S.A.  
Companhia Aberta  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.0015881-4

**ATA DA 344ª REUNIÃO DO CONSELHO DE ADMINISTRAÇÃO  
DA TELEFÔNICA BRASIL S.A.**

Ordinária do ano de 2019. O Conselho de Administração também aprovou a indicação do Sr. Christian Mauad Gebara ao cargo de Conselheiro de Administração, que restou vacante desde a Assembleia Geral Extraordinária realizada em 30 de novembro de 2018. O mandato do conselheiro ora eleito se iniciará em 1º de janeiro de 2019, em complementação ao mandato em curso, e se encerrará na data da próxima Assembleia Geral Ordinária. O Sr. Eduardo Navarro de Carvalho permanecerá como Presidente do Conselho de Administração da Companhia.

Nesta oportunidade, os membros do Conselho de Administração expressaram seus votos de agradecimento ao Sr. Eduardo Navarro de Carvalho pelos relevantes serviços prestados à Companhia no desempenho do referido cargo, desejando contínuo sucesso em seus novos desafios no Grupo Telefônica. Ainda, os conselheiros desejaram votos de sucesso ao Sr. Christian Mauad Gebara para os novos desafios a serem assumidos.

O Diretor Presidente ora eleito informou que não se encontra incurso nos impedimentos legais para o exercício do cargo para o qual foi eleito e que se encontra em condições de firmar a declaração de desimpedimento de que trata o art. 147 da Lei nº 6.404/1976 e a Instrução CVM 367/2002. O Diretor Presidente será investido em seu cargo, em 1º de janeiro de 2019, mediante assinatura do termo de posse e da declaração de desimpedimento que serão firmados na referida data, e arquivados na sede social da Companhia.

Em 1º de janeiro de 2019, o Sr. Christian Mauad Gebara tomará posse ao cargo de Diretor Presidente, de modo que a Diretoria da Companhia passará a ter a seguinte composição a partir da referida data: i) Christian Mauad Gebara, Diretor Presidente; ii)

3ª TABELÃO DE NOTAS - S. PAULISTA  
AUTENTICAÇÃO  
Eduardo de Sábo Kawano - Tabelião Inteiro  
Av. São João, 100 - 1º andar - 01011-900 - São Paulo - SP  
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CARGO NOTARIAL  
S. PAULISTA  
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**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

**TERMO DE POSSE**

Eu, **Christian Mauad Gebara**, brasileiro, casado, administrador de empresas, portador da Cédula de Identidade nº 15.548.716-4, expedida pela SSP/SP, inscrito no CPF/MF sob nº 203.838.628-50, residente e domiciliado na cidade de São Paulo, Estado de São Paulo, com endereço comercial na Av. Eng. Luiz Carlos Berrini, nº 1376, Bairro Cidade Monções, CEP 04571-936, atendendo à deliberação da 344ª Reunião do Conselho de Administração da Telefônica Brasil S.A., sociedade por ações, com sede localizada na Av. Engenheiro Luiz Carlos Berrini, nº 1376, na Cidade de São Paulo, Estado de São Paulo, inscrita no CNPJ/MF sob o nº 02.558.157/0001-62 ("Companhia"), realizada no dia 12 de dezembro de 2018, declaro, neste ato, aceitar o cargo de **Conselheiro de Administração da Telefônica Brasil S.A.**, com mandato que se inicia nesta data e se encerrará na data da próxima Assembleia Geral Ordinária do ano de 2019, pelo que foi lavrado o presente Termo de Posse, para que surta os devidos efeitos legais, ficando assim investido em todos os direitos e obrigações que conferem a Lei e o Estatuto Social da Companhia, e declaro e ratifico, sob as penas da Lei, não me encontrar incurso nos impedimentos legais, inclusive aqueles mencionados no artigo 147 da Lei nº 6.404/76, para o exercício do cargo para o qual fui eleito.

São Paulo, 01 de janeiro de 2019.

  
\_\_\_\_\_  
**Christian Mauad Gebara**



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**TELEFÔNICA BRASIL S.A.**

Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-62 - NIRE 35.3.001.5881-4

**TERMO DE POSSE**

Eu, **Christian Mauad Gebara**, brasileiro, casado, administrador de empresas, portador da Cédula de Identidade nº 15.548.716-4, expedida pela SSP/SP, inscrito no CPF/MF sob nº 203.838.628-50, residente e domiciliado na cidade de São Paulo, Estado de São Paulo, com endereço comercial na Av. Eng. Luiz Carlos Berrini, nº 1376, Bairro Cidade Monções, CEP 04571-936, atendendo à deliberação da 344ª Reunião do Conselho de Administração da Telefônica Brasil S.A., sociedade por ações, com sede localizada na Av. Engenheiro Luiz Carlos Berrini, nº 1376, na Cidade de São Paulo, Estado de São Paulo, inscrita no CNPJ/MF sob o nº 02.558.157/0001-62 ("Companhia"), realizada no dia 12 de dezembro de 2018, declaro, neste ato, aceitar o cargo de **Diretor Presidente da Telefônica Brasil S.A.**, com mandato que se inicia nesta data e se encerrará na data da primeira Reunião do Conselho de Administração que se realizar após a Assembleia Geral Ordinária do ano de 2019, pelo que foi lavrado o presente Termo de Posse, para que surta os devidos efeitos legais, ficando assim investido em todos os direitos e obrigações que conferem a Lei e o Estatuto Social da Companhia, e declaro e ratifico, sob as penas da Lei, não me encontrar incurso nos impedimentos legais, inclusive aqueles mencionados no artigo 147 da Lei nº 6.404/76, para o exercício do cargo para o qual fui eleito.

São Paulo, 01 de janeiro de 2019.



Christian Mauad Gebara



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*Telefônica*

**TELEFÔNICA BRASIL S.A.**  
Companhia Aberta de Capital Autorizado  
CNPJ/MF 02.558.157/0001-52 - NIRE 35.3.001.5881-4

**DECLARAÇÃO DE DESIMPEDIMENTO**

Para os efeitos do disposto no § 4º do art. 147 da Lei nº 6.404/76, eu, **Christian Mauad Gebara**, brasileiro, casado, administrador de empresas, portador da Cédula de Identidade nº 15.548.716-4 expedida pela SSP/SP, inscrito no CPF/MF sob nº 203.838.628-50, residente e domiciliado na cidade de São Paulo, Estado de São Paulo, com endereço comercial na Av. Eng. Luiz Carlos Berrini, nº 1376, Bairro Cidade Monções, CEP 04571-936, declaro, sob as penas da Lei: (i) não estar impedido por lei especial, ou condenado por crime falimentar, de prevaricação, peita ou suborno, concussão, peculato, contra a economia popular, a fé pública, ou a propriedade, ou a pena criminal que vede, ainda que temporariamente, o acesso a cargos públicos, como previsto no § 1º do artigo 147 da Lei nº 6.404/76; (ii) não estar condenado a pena de suspensão ou inabilitação temporária aplicada pela Comissão de Valores Mobiliários, que me torne inelegível para os cargos de administração de companhia aberta, como estabelecido no § 2º do artigo 147 da Lei nº 6.404/76; (iii) atender ao requisito de reputação ilibada estabelecido pelo § 3º do artigo 147 da Lei nº 6.404/76; e (iv) não ocupar cargo em sociedade que possa ser considerada concorrente da Companhia, e não ter, nem representar, interesse conflitante com o da Companhia, na forma dos incisos I e II do § 3º do artigo 147 da Lei nº 6.404/76.

São Paulo, 01 de Janeiro de 2019.



Christian Mauad Gebara













OFICIAL DE REGISTRO CIVIL DAS PESSOAS NATURAIS DO 34º SUBDISTRITO DE  
CERQUEIRA CESAR  
SÃO PAULO - SP  
COMARCA DE SÃO PAULO - ESTADO DE SÃO PAULO  
OFICIAL ADOLFO JOSÉ BASTOS DA CUNHA



TRASLADO

LIVRO Nº 0163

PÁGINA 207/216

PROCURAÇÃO BASTANTE QUE FAZEM: TELEFONICA BRASIL S.A, INNOWEB LTDA, POP INTERNET LTDA. E SP TELECOMUNICAÇÕES PARTICIPAÇÕES LTDA. NA FORMA ABAIXO

S A I B A M quantos este público instrumento de procuração bastante virem que aos vinte (20) dias do mês de março de dois mil e dezanove (2019), nesta Cidade de São Paulo, em diligência na sede da empresa, perante mim, Escrevente Autorizado e do Oficial do 34º Registro Civil Cerqueira César, que esta subscreve, compareceram como outorgantes: **TELEFÔNICA BRASIL S.A.**, com sede social na Av. Eng. Luiz Carlos Berrini, 1.376, Bairro Cidade Monções, São Paulo, Estado de São Paulo, CEP 04571-936, inscrita no CNPJ/MF sob o nº 02.558.157/0001-62, e suas respectivas filiais, com seu Estatuto Social Consolidado através da Ata da 50ª Assembléia Geral Extraordinária, realizada em 30/11/2018, devidamente registrada e arquivada na Junta Comercial do Estado de São Paulo - JUCESP sob o nº 578.337/18-6, em sessão de 10/12/2018, neste ato de acordo com o Capítulo V, Artigo 22º, parágrafo 3º do mencionado Estatuto Social, legalmente representada por seu Secretário Geral e Diretor Jurídico Sr. **BRENO RODRIGO PACHECO DE OLIVEIRA**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS nº 45.479 e regularmente inscrito perante o CPF/MF sob o nº 711.936.930-04 e por seu Diretor de Finanças e de Relações com Investidores Sr. **DAVID MELCON SANCHEZ-FRIERA**, espanhol, casado, economista, portador da cédula de estrangeiro RNE nº G240737-5, regularmente inscrito perante o CPF/MF sob o nº 238.558.708-45, ambos eleitos na 297ª Reunião do Conselho de Administração, ocorrida em 10/01/2016, devidamente registrada e arquivada na Junta Comercial do Estado de São Paulo - JUCESP, sob o nº 273.314/16-6, em sessão de 24/06/2016, ficando cópia autenticada das referidas atas arquivadas nesta Serventia (Pastas 046, 051, 052, 057, 065, 67, 85, 86, 89, 107, 110, 123, 128, 131, 137, 142, 165, 168, 219; Fls. 113, 111, 110-113; 088-110; 170-171, 126-152, 001-024; 084-107; 108-110; 035-059; 060-062; 119-144; 120-150; 132-133; 062-098; 097-124; 001-002, 064-065, 033-114, 134-220; 016-038, 035-096); **INNOWEB LTDA.**, com sede social na Rua Lourenço Pinto, 299, 1º andar, cidade de Curitiba, Estado do Paraná, CEP 80010-160, inscrita no CNPJ/MF sob o nº 07.621.112/0001-09, com seu Contrato Social Consolidado através da 9ª Alteração Contratual, datada de 02/01/2019, devidamente registrada e arquivada na Junta Comercial do Paraná sob o nº 20190681187, em sessão de 22/02/2019, neste ato de acordo com a Cláusulas 6ª e 7ª, do mencionado Contrato Social, legalmente representada por seu Secretário Geral e Diretor Jurídico Sr. **BRENO RODRIGO PACHECO DE OLIVEIRA**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS nº 45.479 e regularmente inscrito perante o CPF/MF sob o nº 711.936.930-04 e por seu Diretor de Finanças Sr. **DAVID MELCON SANCHEZ-FRIERA**, espanhol, casado, economista, portador da cédula de estrangeiro RNE nº G240737-5, regularmente inscrito perante o CPF/MF sob o nº 238.558.708-45; ambos com endereço comercial na Av. Engº Luiz Carlos Berrini, 1376 - 32º andar, São Paulo/SP, ficando cópia autenticada da referida ata arquivada nesta Serventia (Pastas 142, 160, 166, 172, 185, 224; Fls. 174-183; 103-117; 063-126; 106-120; 144-160; 096-112); **POP INTERNET LTDA.**, com sede social na Rua Lourenço Pinto, 299, 14º andar, cidade de Curitiba, Estado do Paraná, CEP 80010-160, inscrita no CNPJ/MF sob o nº 03.809.228/0001-15, com seu Contrato Social Consolidado através da 19ª Alteração Contratual, datada de 02/01/2019, devidamente registrada e arquivada na Junta Comercial do Paraná sob o nº 20190735040, em sessão de 18/02/2019, neste ato de acordo com a Cláusula 6ª e 7ª, do mencionado Contrato Social, legalmente representada por seu Secretário Geral e Diretor Jurídico Sr. **BRENO RODRIGO PACHECO DE OLIVEIRA**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS nº 45.479 e regularmente inscrito perante o CPF/MF sob o nº 711.936.930-04 e por seu Diretor de Finanças Sr. **DAVID MELCON SANCHEZ-FRIERA**, espanhol, casado, economista, portador da cédula de estrangeiro RNE nº G240737-5, regularmente inscrito perante o CPF/MF sob o nº 238.558.708-45; ambos com endereço comercial na Av. Engº Luiz Carlos Berrini, 1376 - 32º andar, São Paulo/SP, ficando cópia autenticada da referida ata arquivada nesta Serventia (Pastas 145, 160, 166, 173, 174, 185, 222; Fls. 034-044; 095-102; 127-153; 006-021; 016-031; 161-176; 127-143) e **SP TELECOMUNICAÇÕES PARTICIPAÇÕES LTDA.**, com sede na Capital do Estado de São Paulo, na Rua Martiniano de Carvalho, nº 851, 20ª Andar, Parte, inscrita no CNPJ/MF sob o nº 01.900.954/0001-13, com seu Contrato Social Consolidado através da 39ª Alteração Contratual, datada de 02/01/2019, devidamente registrada e arquivada na Junta Comercial do Estado de São Paulo - JUCESP sob o nº 40.610/19-6/18-4, em sessão de 30/01/2019, neste ato em conformidade com Capítulo III a Cláusula 9ª da mencionada alteração, legalmente representada por seu Diretor o Sr. **BRENO RODRIGO PACHECO DE OLIVEIRA**, brasileiro, casado, advogado, portador da cédula de identidade profissional OAB/RS nº 45.479 e regularmente inscrito perante o CPF/MF sob o nº 711.936.930-04 e por seu Diretor o Sr. **DAVID MELCON SANCHEZ-FRIERA**, espanhol, casado, economista, portador da cédula de estrangeiro RNE nº G240737-5, regularmente inscrito perante o CPF/MF sob o nº 238.558.708-45; ambos com endereço comercial na Av. Engº Luiz Carlos Berrini, 1376 - 32º andar, São Paulo/SP, cujas cópias autenticadas ficam arquivadas nesta Serventia (Pasta 108, 117, 142, 149, 155, 166, 168, 172, 174, 185, 199, 221; Fls. 197-209, 065-075, 138-148; 026-041; 167-179; 154-193; 051-057; 121-129; 032-041; 177-186; 197-205; 078-085). Reconhecidos como os próprios de que trato, pelo exame dos documentos apresentados, do que dou fé. E si pelas referidas OUTORGANTES, na forma acima representadas, me foi dito que presente público instrumento e na

REPÚBLICA FEDERATIVA DO BRASIL



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RUA FREI CANECA 371 CONSOLAÇÃO  
SÃO PAULO SP CEP 01017-001  
FONE/FAX 11 5015-1133

Estado de São Paulo - 10 de Março de 2019

Assinatura do Oficial de Registro Civil





REPÚBLICA FEDERATIVA DO BRASIL  
Estado de São Paulo



melhor forma de direito nomeia e constitui por seus bastantes procuradores: **ALEX MARTINS SALGADO**, brasileiro, divorciado, engenheiro eletricitista, portador do documento de identidade nº 28555382-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 267.046.658-38; **ANDRÉ MEIRINO NIGRO**, brasileiro, casado, contador, portador do documento de identidade nº 97214548, expedido pelo IFP/RJ, e inscrito no CPF/MF sob o nº 028.995.577-77; **ALEXANDRE MACHADO SILVA**, brasileiro, casado, engenheiro, portador do documento de identidade nº 501.125.255, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 025.013.437-35; **ANDERSON DE OLIVEIRA SILVA**, brasileiro, casado, administrador, portador do documento de identidade nº M-5991545, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 017.590.427-81; **ANDERSON EMANUEL DE AZEVEDO GONÇALVES**, brasileiro, casado, engenheiro, portador do documento de identidade nº 07042238-1, expedido pelo IFP/RJ, e inscrito no CPF/MF sob o nº 010.212.667-44; **FÁBIO SARNO BALLADI**, brasileiro, casado, arquiteto, portador do documento de identidade nº 22.231.501-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 273.924.208-52; **FELIPE AUGUSTO FERRAZ DE CAMPOS**, brasileiro, casado, engenheiro, portador do documento de identidade nº 286348329, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 281.528.568-19; **FLÁVIO CINTRA GUIMARÃES**, brasileira, casado, administrador, portador do documento de identidade nº 1158676, expedido pela SSP/DF, e inscrito no CPF/MF sob o nº 490.603.251-68; **LEO IVAN PETERSEN JÚNIOR**, brasileiro, casado, engenheiro, portador do documento de identidade nº 1013778954, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 378.339.440-68; **RICARDO PEDRETI CHAGAS**, brasileiro, casado, engenheiro, portador do documento de identidade nº 167973137, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 194.262.568-57; **RODRIGO PEREIRA DA SILVA JUNIOR**, brasileiro, casado, administrador, portador do documento de identidade nº 1.217.063-1, expedido pela SSP/AM, e inscrito no CPF/MF sob o nº 601.791.712-91; **WALTEMIR OKTA VIEIRA**, brasileiro, casado, engenheiro elétrico, portador do documento de identidade nº 18.883.594-5, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 132.906.448-80; **ADRIANA FEDERICO CALMON**, brasileira, casada, engenheira, portadora do documento de identidade nº 18.276.029-7, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 129.138.038-81; **AIX ANDRÉ MACHADO CORREA**, brasileiro, casado, administrador, portador do documento de identidade nº 23058598-X, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 252.665.818-75; **ALAN RICARDO LARANJEIRA**, brasileiro, casado, administrador, portador do documento de identidade nº 196700413, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 026.375.929-66; **ALESSANDRA OLIVEIRA JUNQUEIRA**, brasileira, divorciada, administradora, portadora do documento de identidade nº 228843194, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 184.634.518-96; **ALESSANDRO SOARES DOS SANTOS**, brasileiro, casado, formado em ciências da computação, portador do documento de identidade nº 256610897, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 168.288.308-65; **ALEX EDUARDO DE FREITAS**, brasileiro, casado, administrador, portador do documento de identidade nº 21993730, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 070.661.598-02; **ALEXANDRE BARRETO DA GAMA FREITAS**, brasileiro, casado, administrador, portador do documento de identidade nº 059.75.287-3, expedido pelo IFP/RJ, e inscrito no CPF/MF sob o nº 806.279.787-20; **ALEXANDRE BORTULUCI**, brasileiro, casado, arquiteto urbanista, portador do documento de identidade nº 1213769, expedido pela SSP/ES, e inscrito no CPF/MF sob o nº 256.948.258-70; **ALEXANDRE CSISZER PAIN**, brasileiro, divorciado, administrador, portador do documento de identidade nº 42512087, expedido pela SSP/PR, e inscrito no CPF/MF sob o nº 611.884.339-20; **ALEXANDRE FREITAS DA SILVA**, brasileiro, casado, sociólogo, portador do documento de identidade nº 1770578, expedido pela SSP/PE, e inscrito no CPF/MF sob o nº 363.298.944-34; **ALEXANDRE MARQUES ANHAIA**, brasileiro, casado, administrador, portador do documento de identidade nº 14380017, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 048.263.178-32; **ALEXANDRE ORNELAS FORGANS**, brasileiro, casado, engenheiro, portador do documento de identidade nº 16246957-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 098.025.368-30; **ANDERSON DIAS FONSECA**, brasileiro, casado, engenheiro eletricitista, portador do documento de identidade nº 227357504, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 152.671.158-35; **ANDRÉ LUIZ MOREIRA ROLIM**, brasileiro, casado, engenheiro eletricitista, portador do documento de identidade nº 94008000130, expedido pela SSP/CE, e inscrito no CPF/MF sob o nº 619.538.063-68; **ANDRÉ VARTAN FERREIRA KELESOGLU**, brasileiro, casado, economista, portador do documento de identidade nº 10848905-5, expedido pelo IFP/RJ, e inscrito no CPF/MF sob o nº 076.814.947-90; **ANDRESSA SIMONE MERTINS DE OLIVEIRA**, brasileira, casada, mercadóloga, portadora do documento de identidade nº 3079109264, expedido pelo SJS/RS/RS, e inscrita no CPF/MF sob o nº 822.144.090-68; **ANIBAL FELIPE SCHREINER**, brasileiro, casado, bacharel em sistemas de informação, portador do documento de identidade nº 81707294, expedido pela SSP/PR, e inscrito no CPF/MF sob o nº 004.545.259-82; **ARIEL NASCIMENTO DE OLIVEIRA**, brasileira, casada, bacharel em sistemas de informação, portadora do documento de identidade nº 283644, expedido pela SSP/AP, e inscrita no CPF/MF sob o nº 794.073.312-53; **BERNARDO BRAYNER DE ALMEIDA**, brasileiro, casado, formado em relações públicas, portador do documento de identidade nº 5744661, expedido pela SSP/PE, e inscrito no CPF/MF sob o nº 042.362.184-02; **CARLOTA BRAGA DE ASSIS LIMA**, brasileira, casada, administradora, portadora do documento de identidade nº 630.486, expedido pela SSP/DF, e inscrita no CPF/MF sob o nº 613.174.201-44; **CLAITON MERG CARVALHO**, brasileiro, casado, administrador, portador do documento de identidade nº 5016055898, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 404.943.900-00; **CLAUDIA DA SILVA LÉO**, brasileira, divorciada, publicitária, portadora do documento de identidade nº 22.696.572-7, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 143.399.538-73; **CLÁUDIO RIBEIRO DE JESUS**, brasileiro, casado, administrador,

35 TABELÃO DE NOTAS, S. Paulo

Autenticação de São Paulo - Instituto Brasileiro de Registro e Cartório

Av. São Luís, 127 - 1304 - Tel. (11) 340-8800

S. Paulo, 09 de Setembro de 2008

PS 150

Autentica a presente cópia fotográfica a partir de uma originalizada na presença de duas testemunhas autorizadas pelo Tabelião de São Paulo.

VALIDO SOMENTE COM SELLO DE AUTENTICAÇÃO

113340

AUTENTICAÇÃO

OFICIAL DE REGISTRO CIVIL DAS PESSOAS NATURAIS DO 34º SUBDISTRITO DE  
CERQUEIRA CESAR  
SÃO PAULO - SP  
COMARCA DE SÃO PAULO - ESTADO DE SÃO PAULO  
OFICIAL ADOLPHO JOSE BASTOS DA CUNHA



portador do documento de identidade nº 241703347, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 153.320.688-08; **CLEBER PINHEIRO LIMA**, brasileiro, casado, matemático, portador do documento de identidade nº 1041332741, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 652.051.030-00; **CRISTIANO VELOSO SOUZA MENDES**, brasileiro, casado, administrador de empresas, portador do documento de identidade nº MG 6076799, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 037.204.176-03; **DANIELE SOPHIA SARMENTO**, brasileira, divorciada, bacharel em relações públicas, portadora do documento de identidade nº 25.909.382-8, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 188.182.328-86; **DIEGO FRANCISCO BRASIL DE SOUZA**, brasileiro, casado, administrador, portador do documento de identidade nº 1080294422, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 808.805.680-20; **DUCLERC GUIMARÃES DAVID LADEIA**, brasileiro, solteiro, administrador, portador do documento de identidade nº 3.481.132, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 809.761.821-49; **EDGAR RODRIGUES GIAGIO**, brasileiro, casado, marketing, portador do documento de identidade nº 293486803, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 280.614.888-09; **ÉRICA DO NASCIMENTO DE NÁPOLES**, portuguesa, casada, publicitária, portadora do documento de identidade nº V4964483, e inscrita no CPF/MF sob o nº 052.073.087-93; **ERICA REIS DE MELO COUTRINS**, brasileira, solteira, administradora, portadora do documento de identidade nº 3413850, expedido pela SSP/GO, e inscrita no CPF/MF sob o nº 879.849.111-34; **FABIA MARIA MENDONÇA MARTINS**, brasileira, casada, analista de sistemas, portadora do documento de identidade nº 3135659, expedido pela SSP/GO, e inscrita no CPF/MF sob o nº 845.461.821-04; **FABIO ANTUNES DOS SANTOS**, brasileiro, casado, administrador de empresas, portador do documento de identidade nº 571199020, expedido pela SSP/BA, e inscrito no CPF/MF sob o nº 924.043.245-00; **FÁBIO COSTA DA ROCHA AZEVEDO**, brasileiro, casado, advogado, portador do documento de identidade nº 114368681, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 076.400.277-56; **FABIO DE CAMARGO PENTEADO SILVA**, brasileiro, casado, formado em tecnologia da informação, portador do documento de identidade nº 189669238, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 146.471.568-85; **FABIO HENRIQUE TRINDADE FERREIRA**, brasileiro, casado, bacharel em direito, portador do documento de identidade nº 24.427.959-7, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 248.331.408-29; **FÁBIO MARQUES DE SOUZA LEVORIN**, brasileiro, casado, administrador, portador do documento de identidade nº 27.638.106-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 267.221.148-56; **FABIO PRADO BACHA**, brasileiro, solteiro, bacharel em ciência da computação, portador do documento de identidade nº 236692975, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 199.463.888-55; **FABIO ROBERTO PERES**, brasileiro, casado, bacharel em direito, portador do documento de identidade nº 29232788, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 196.435.628-83; **FABIO SANTIAGO FIONDA**, brasileiro, casado, administrador, portador do documento de identidade nº 109280339, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 076.941.357-94; **FERNANDO DA COSTA DUSCHITZ**, brasileiro, casado, economista, portador do documento de identidade nº 6067816972, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 893.657.120-68; **FIRMINO SANCHES NETO**, brasileiro, casado, químico, portador do documento de identidade nº 41811540-0, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 328.127.498-65; **FRANZ SCHUBERT DE MORAES**, brasileiro, casado, contador, portador do documento de identidade nº M4921727, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 736.652.236-87; **GISELE CRISTINA GARCIA JORGETTI**, brasileira, casada, administradora, portadora do documento de identidade nº 216364754, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 166.905.978-22; **GISELE DE RAMOS MELO**, brasileira, divorciada, administradora, portadora do documento de identidade nº 3763145, expedido pela SSP/GO, e inscrita no CPF/MF sob o nº 913.426.781-68; **GLAUBER GELMI BRASIL**, brasileiro, solteiro, administrador, portador do documento de identidade nº 289078891, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 331.039.168-09; **GUILHERME AUGUSTO DE SOUZA SIQUEIRA**, brasileiro, casado, administrador, portador do documento de identidade nº M8812132, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 042.114.336-36; **GUILHERME BARTHOLOMEU SARUBI**, brasileiro, casado, formado em sistemas de informação, portador do documento de identidade nº 24874365X, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 318.564.098-56; **GUILHERME SARNO BALLADI**, brasileiro, casado, administrador, portador do documento de identidade nº 22.213.502-5, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 287.392.418-74; **GUSTAVO SOBREIRO GONÇALVES**, brasileiro, casado, administrador, portador do documento de identidade nº 339435811, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 297.041.528-33; **HELEN VIEIRA MICERIN**, brasileira, casada, tecnóloga em construção civil, portadora do documento de identidade nº 34533418-8, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 295.769.848-07; **HUBERTI EDNILSON DA COSTA PINTO**, brasileiro, solteiro, administrador, portador do documento de identidade nº 8048901873, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 661.341.700-97; **IGARA TAARI COUTINHO LEO**, brasileira, casada, administradora, portadora do documento de identidade nº 691406340, expedido pela SSP/BA, e inscrita no CPF/MF sob o nº 689.235.545-53; **ILDEBRANDO PINTO APARECIDO JUNIOR**, brasileiro, casado, engenheiro, portador do documento de identidade nº 183182704, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 258.674.898-09; **JAQUELINE DIAS COSTA DUARTE**, brasileira, casada, administradora, portadora do documento de identidade nº 4075408452, expedido pela SSP/RS, e inscrita no CPF/MF sob o nº 822.106.750-49; **JEFFERSON MARTINS MADUREIRA**, brasileiro, solteiro, administrador de empresas, portador do documento de identidade nº 4142963, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 993.152.461-87; **JOÃO GERALDO DE SOUZA**, brasileiro, casado, administrador, portador do documento de identidade nº 1041332741, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 652.051.030-00.

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nº 935.191, expedido pela SSP/MT, e inscrito no CPF/MF sob o nº 595.148.091-49; **JOAO RODRIGO ANTUNES FERREIRA**, brasileiro, casado, administrador, portador do documento de identidade nº 241036392, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 290.754.518-30; **JOSE EUSTÁQUIO MENDONÇA DA FONSECA**, brasileiro, casado, contador, portador do documento de identidade nº 5.432.697, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 731.577.396-04; **JOSÉ OSCAR AZEVEDO JUNIOR**, brasileiro, casado, administrador, portador do documento de identidade nº 299123625, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 032.860.479-88; **JOSE RENATO BONATES CORREA**, brasileira, casado, comerciante, portador do documento de identidade nº 7872189, expedido pela SSP/SC, e inscrito no CPF/MF sob o nº 598.350.952-72; **JUAN ANTONIO GARCIA GÓMEZ**, brasileiro, casado, engenheiro de telecomunicações, portador do documento de identidade nº 099240145, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 012.694.897-63; **KAMILA LIMA CARVALHO**, brasileira, divorciada, administradora, portadora do documento de identidade nº 558033003, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 791.173.842-49; **KARINA DE CARVALHO E SILVA**, brasileira, casada, pedagoga, portadora do documento de identidade nº 2452762, expedido pela SSP/PA, e inscrita no CPF/MF sob o nº 425.686.412-15; **LEANDRO SINKOVITS**, brasileiro casado, tecnólogo, portador do documento de identidade nº 233341626, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 283.920.858-09; **LEONARDO ASSIS DE SOUZA**, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 11069106, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 042.953.446-99; **LETICIA SANDRINE GONÇALVES MUZZI**, brasileira, casada, administradora, portadora do documento de identidade nº 42632315, expedido pela SSP/SC, e inscrita no CPF/MF sob o nº 042.339.459-80; **LIDSON JOSE ROCHA SILVA**, brasileira, casado, administrador, portador do documento de identidade nº 90002030247, expedido pela SSP/CE, e inscrito no CPF/MF sob o nº 589.860.223-20; **LILIAM ELISABETH DE LIMA ROSA**, brasileira, casada, engenheira, portadora do documento de identidade nº 29.287.307-4, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 279.218.028-50; **LUCIANO ANDRADE**, brasileiro, casado, comerciante, portador do documento de identidade nº 9019706333, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 590.188.440-04; **LUCIANO POMPEO PASQUALINI**, brasileiro, casado, administrador, portador do documento de identidade nº 117667080, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 060.800.008-65; **LUIS AUGUSTO SANDER**, brasileiro, casado, administrador, portador do documento de identidade nº 1035522646, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 587.739.750-87; **LUIS OTAVIO CAVALCANTI MONTIBELO**, brasileiro, casado, formado em marketing, portador do documento de identidade nº 4664376, expedido pela SSP/PE, e inscrito no CPF/MF sob o nº 770.673.204-53; **LUIZ SERGIO MOTA MAGALHÃES**, brasileiro, casado, engenheiro, portador do documento de identidade nº 5466627, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 758.524.706-00; **MARCELO ALEXANDRE LAURATO**, brasileiro, casado, administrador, portador do documento de identidade nº 345805963, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 223.705.928-42; **MARCELO ATAÍDE DE OLIVEIRA**, brasileiro, casado, administrador, portador do documento de identidade nº 73904951, expedido pela SSP/PR, e inscrito no CPF/MF sob o nº 271.741.152-68; **MARCELO DA SILVA ASSUNÇÃO**, brasileiro, casado, administrador, portador do documento de identidade nº 18.304.607, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 094.620.888-37; **MARCELO DE ALMEIDA BUCANEVE**, brasileiro, casado, economista, portador do documento de identidade nº 6089013, expedido pela SSP/SC, e inscrito no CPF/MF sob o nº 752.606.629-20; **MARCELO DE LIMA TARDIVO**, brasileiro, casado, formado em relações públicas, portador do documento de identidade nº 323466608, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 294.313.248-90; **MARCELO GONÇALVES DA SILVA**, brasileiro, casado, administrador, portador do documento de identidade nº 19.502.368-7, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 166.491.058-13; **MARCELO IACABO**, brasileiro, casado, engenheiro, portador do documento de identidade nº 18.501.873, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 108.369.358-10; **MARCELO RABETTI**, brasileiro, casado, engenheiro, portador do documento de identidade nº 20.316.533-0, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 148.481.278-66; **MARCIO DANILO DE SÁ**, brasileiro, casado, bacharel em direito, portador do documento de identidade nº 16.542.834, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 152.499.018-32; **MÁRCIO SANCHOTENE IRIZAGA**, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 3081770442, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 692.630.860-87; **MÁRCIO SANTOS DA CUNHA**, brasileiro, casado, administrador, portador do documento de identidade nº 110653979, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 051.775.397-92; **MARCOS PEREIRA DE SOUSA**, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 4102090, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 929.136.951-91; **MARCOS ROBERTO MIYATA**, brasileiro, casado, engenheiro, portador do documento de identidade nº 330506390, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 282.783.378-61; **MARIANA FERREIRA**, brasileira, solteira, economista, portadora do documento de identidade nº 348931116, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 344.626.888-05; **MARIANA VIEIRA RANGEL NUNES**, brasileira, solteira, engenheira, portadora do documento de identidade nº 08109314-8, expedido pelo IFF/RJ, e inscrita no CPF/MF sob o nº 051.481.137-40; **MAURICIO GIANOTI LUSTRE**, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 18.436.062-6, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 148.259.118-97; **MAYKEL DE OLIVEIRA CASTRO**, brasileiro, casado, engenheiro elétrico, portador do documento de identidade nº 2083487, expedido pela SSP/DF, e inscrito no CPF/MF sob o nº 724.105.661-20; **MONICA DE LIMA SILVA**, brasileira, divorciada, administradora, portadora do documento de identidade nº 0821159909, expedido pela SSP/BA, e inscrita no CPF/MF sob o nº 106419544999

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SGOBBI, brasileiro, divorciado, engenheiro, portador do documento de identidade nº 155053073, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 063.323.488-52; ORIVAL AIRTON TRAJANO DOS REIS, brasileiro, solteiro, administrador, portador do documento de identidade nº 4027732512, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 392.100.570-15; ORLAN ALVES CARDOSO, brasileiro, casado, administrador, portador do documento de identidade nº 289478, expedido pela SSP/TO, e inscrito no CPF/MF sob o nº 829.553.791-15; OTÁVIO PAVONE DE OLIVEIRA, brasileiro, casado, administrador, portador do documento de identidade nº 49729529, expedido pela SSP/PR, e inscrito no CPF/MF sob o nº 007.381.919-06; PAULO CEZAR COSTA MENEZES, brasileiro, casado, químico industrial, portador do documento de identidade nº 43336908, expedido pela SSP/PR, e inscrito no CPF/MF sob o nº 709.791.469-68; PAULO SEVERINO DA SILVA, brasileiro, casado, administrador, portador do documento de identidade nº 3741466, expedido pelo SDS/PE, e inscrito no CPF/MF sob o nº 030.328.074-33; RAISINS ROGERIO BRAGA DE OLIVEIRA, brasileiro, casado, engenheiro mecânico, portador do documento de identidade nº 13823698, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 055.822.208-01; RAPHAEL HENRIQUE DE ALMEIDA COSTA, brasileiro, casado, administrador, portador do documento de identidade nº 32.352.929-x, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 313.452.798-76; REGIANE DE JESUS SILVEIRA PISSUTTI, brasileira, casada, publicitária, portadora do documento de identidade nº 271577290, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 256.107.508-73; RENATO DE OLIVEIRA SOUZA, brasileiro, casado, engenheiro, portador do documento de identidade nº 19392910, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 148.926.148-66; RICARDO JOSE FIGUEIRA, brasileiro, solteiro, administrador de empresas, portador do documento de identidade nº 19520511, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 126.842.408-09; RODRIGO RODRIGUES BALLERONI, brasileiro, casado, engenheiro elétrico, portador do documento de identidade nº 276000535, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 220.637.588-59; RODRIGO TIRELLO, brasileiro, casado, administrador, portador do documento de identidade nº 9073755051, expedido pela SSP/RS, e inscrito no CPF/MF sob o nº 941.392.450-34; ROGERIO PUERTA LOPES, brasileiro, casado, administrador de empresas, portador do documento de identidade nº 1.838.401-2, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 123.068.688-67; ROMULO SALES RAGASSI, brasileiro, casado, administrador, portador do documento de identidade nº 26.211.160-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 180.256.888-36; RONES ALVES MACHADO PORTELA, brasileiro, solteiro, engenheiro, portador do documento de identidade nº 138850094, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 031.743.458-63; SARA REGINA COUTO MOTA, brasileira, casada, administradora, portadora do documento de identidade nº 3059328, expedido pela SSP/SC, e inscrita no CPF/MF sob o nº 004.361.699-24; SERGIO CHEREZ PAVIA, brasileiro, casado, formado em propaganda e marketing, portador do documento de identidade nº 336045050, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 272.784.788-20; SILVIA AYUMI MORIOKA, brasileira, solteira, engenheira, portadora do documento de identidade nº 278745702, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 219.914.658-82; SILVIO AMERICO DE SOUSA MELO, brasileiro, casado, administrador, portador do documento de identidade nº M 7.615.288, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 025.861.906-61; SINOMAR MOTA VIEIRA, brasileiro, casado, administrador, portador do documento de identidade nº 2043464DGPC, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 547.834.291-20; TANIA ROSA CAMPOS, brasileira, solteira, tecnóloga em hotelaria, portadora do documento de identidade nº 3455052, expedido pela SSP/GO, e inscrita no CPF/MF sob o nº 867.188.351-53; THAISA MAZZEI SABOLA, brasileira, casada, engenheira, portadora do documento de identidade nº 30.294.465-5, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 303.685.828-84; THIAGO BRUNO FERNANDES, brasileiro, casado, formado em ciências da computação, portador do documento de identidade nº 439862139, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 312.878.558-90; VALTER FERNANDES DE ABREU, brasileiro, casado, administrador, portador do documento de identidade nº 193914554, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 174.309.268-78; VINICIUS ROSSI PASCHOAL, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 20621759, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 256.309.948-08; VIVIAN RAQUEL LOPES, brasileira, casada, administradora, portadora do documento de identidade nº 256420472, expedido pela SSP/RJ, e inscrita no CPF/MF sob o nº 221.000.118-80; WALDYRLEY ANDRADE DE SOUZA, brasileiro, casado, tecnólogo em telecomunicações, portador do documento de identidade nº 70569769, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 861.210.497-15; WELLINGTON ROSA DE ABREU, brasileiro, casado, administrador, portador do documento de identidade nº 107.65684-5, expedido pelo IFF/RJ, e inscrito no CPF/MF sob o nº 040.473.366-29; WELLINGTON XAVIER DA COSTA, brasileiro, solteiro, administrador de empresas, portador do documento de identidade nº 3516308, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 887.321.001-59; WILLIAN TEIXEIRA JOÃO, brasileiro, casado, fisioterapeuta, portador do documento de identidade nº 17.701.201-X, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 276.300.558-62; ABILIO PINTO PIRES NETO, brasileiro, casado, analista de sistemas, portador do documento de identidade nº 1721893, expedido pela SSP/DF, e inscrito no CPF/MF sob o nº 027.163.499-59; ADALBERTO BALLO PEREIRA, brasileiro, casado, matemático, portador do documento de identidade nº 13.792.571-2, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 063.508.738-31; ADRIANA VITALE, brasileira, solteira, administradora, portadora do documento de identidade nº 231476048, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 136.086.255; ALBANIZA TEREZA PEREIRA PESSOA, brasileira, casada, secretária executiva, portadora do documento de identidade nº 8823183, expedido pela SSP/PE, e inscrita no CPF/MF sob o nº 996.120.204-00; ALEXANDRE SILVA MARTINS, brasileiro, casado,

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identidade nº 123960009, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 117.274.288-03; **LUIS GUILHERME BIANCHIN**, brasileiro, casado, engenheiro, portador do documento de identidade nº 92456406, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 035.267.348-60; **MARCELA MARQUES DE SOUZA**, brasileira, solteira, formada em ciências da computação, portadora do documento de identidade nº 297088208, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 828.793.465-68; **MARCELLO GAMITO MENDES**, brasileiro, casado, tecnólogo em comunicação e tecnologia, portador do documento de identidade nº 15.951.844, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 076.250.838-88; **MARCELO APARECIDO PARRIAL**, brasileiro, solteiro, psicólogo, portador do documento de identidade nº 40.054.652-8, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 318.754.128-32; **MARCELO PIMENTEL DE MESQUITA**, brasileiro, casado, administrador, portador do documento de identidade nº 91135640, expedido pelo Detran/RJ, e inscrito no CPF/MF sob o nº 035.375.807-89; **MARCOS ALMEIDA**, brasileiro, casado, engenheiro elétrico, portador do documento de identidade nº 14.978.590-2, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 083.881.028-42; **MARCOS ROBERTO SOARES JR**, brasileiro, divorciado, bacharel em filosofia, portador do documento de identidade nº M4930124, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 118.390.388-02; **MARCOS VINICIUS BOLZAN**, brasileiro, casado, formado em gestão comercial, portador do documento de identidade nº 44774415X, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 384.733.198-18; **MARCUS VINICIUS BARÇANTE DE MOURA**, brasileiro, casado, administrador, portador do documento de identidade nº 10892295, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 050.274.906-74; **MARIA CLARA POIO D'OLIVEIRA BRESSAN**, brasileira, casada, administradora, portadora do documento de identidade nº 11.091.093-X, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 032.954.408-08; **MARIA CONCEIÇÃO DE ALMEIDA BRIETZKE**, brasileira, casada, formada em relações públicas, portadora do documento de identidade nº 8009018121, expedido pela SSP/RS, e inscrita no CPF/MF sob o nº 366.649.600-87; **MARIA CRISTINA CASTELLOS E CASTRO RINCON**, brasileira, casada, engenheira elétrica, portadora do documento de identidade nº MG 5416788, expedido pela SSP/MG, e inscrita no CPF/MF sob o nº 971.894.806-68; **MARIA DA CONCEIÇÃO LIMA**, brasileira, casada, administradora, portador do documento de identidade nº 11089153, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 042.039.666-71; **MARIA IZABEL CRISTINA MENDES LOPES**, brasileira, casada, administradora, portadora do documento de identidade nº 6198122, expedido pela SSP/MG, e inscrita no CPF/MF sob o nº 796.070.126-15; **MARIA LOURDES PAPA CASAGRANDE**, brasileira, casada, matemática, portadora do documento de identidade nº 11.002.135-6, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 031.643.388-80; **MARTA ELOISA OLIVEIRA**, brasileira, solteira, pedagoga, portadora do documento de identidade nº 29.545.850-1, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 223.166.468-24; **MICHEL CORREA DE SOUZA**, brasileiro, casado, engenheiro, portador do documento de identidade nº 257043500, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 277.022.548-07; **NAJARA BONFIM DE SANTANA**, brasileira, solteira, administradora de empresas, portadora do documento de identidade nº 0748886842, expedido pela SSP/BA, e inscrita no CPF/MF sob o nº 009.649.045-43; **NELSON VERPA JUNIOR**, brasileiro, casado, economista, portador do documento de identidade nº 9.340.006-8, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 036.468.738-09; **ORLANDO DE ANTONIO JUNIOR**, brasileiro, separado, administrador, portador do documento de identidade nº 193800007, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 133.609.568-77; **PABLO DO VALE FERNANDES**, brasileiro, casado, mercadólogo, portador do documento de identidade nº 22256385, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 263.329.628-95; **PATRICIA DE ARAUJO PEREIRA**, brasileira, casada, administradora, portadora do documento de identidade nº 32408652-0, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 301.504.098-77; **PATRICIA FERREIRA TEIXEIRA NETTO GRANDE**, brasileira, casada, engenheira, portadora do documento de identidade nº 2875289, expedido pela SSP/DF, e inscrita no CPF/MF sob o nº 074.903.177-89; **PATRICIA HELENA RODRIGUES FREIRE FERREIRA**, brasileira, casada, jornalista, portadora do documento de identidade nº 983174, expedido pela SSP/MS, e inscrita no CPF/MF sob o nº 921.625.411-49; **PAULA CAMILA MENDONÇA DE AMEIDA**, brasileira, casada, administradora, portadora do documento de identidade nº 27997499, expedido pela SSP/AM, e inscrita no CPF/MF sob o nº 715.930.472-15; **PAULO AFONSO CALADO JUNIOR**, brasileiro, casado, administrador, portador do documento de identidade nº 92.006.021.59-1, expedido pela SSP/CE, e inscrito no CPF/MF sob o nº 526.339.933-20; **PAULO EDUARDO CESAR**, brasileiro, casado, engenheiro, portador do documento de identidade nº 7.906.000-6, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 008.534.088-07; **PAULO ROBERTO CEIA BRAVO**, brasileiro, divorciado, administrador, portador do documento de identidade nº 41204066, expedido pelo Detran/RJ, e inscrito no CPF/MF sob o nº 615.438.617-68; **PAULO ROGÉRIO DOS SANTOS**, brasileiro, casado, administrador, portador do documento de identidade nº 14.263.890-0, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 091.756.318-22; **REGINA JARA MOTTA**, brasileira, casada, administradora, portadora do documento de identidade nº 155612840, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 037.303.838-09; **RENATA SIMIONATO CARDOSO**, brasileira, casada, bacharel em direito, portadora do documento de identidade nº 44.559.750-1, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 366.012.348-00; **RENATO RESENDE PONTES**, brasileiro, casado, administrador, portador do documento de identidade nº 6356921, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 011.899.476-09; **RICARDO AUGUSTO PINTO**, brasileiro, casado, comunicador social, portador do documento de identidade nº 15.783.347, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 101.257.728-13; **ROBERTA CAPP PACHECO SALEH**, brasileira, casada, administradora, portadora do documento de identidade nº 013463404, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 013463404.

3. ATRIBUIÇÃO DE NOME SOCIAL  
Emissão de 100 documentos - Total de 100  
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S. Paulo, 09 de Maio de 2019  
R\$ 3,50

Autenticado em  
Arquivo Geral do Estado

SECRETARIA DE ADMINISTRAÇÃO  
UNIDADE SOLENTE COM. REG. CIVIL

OFICIAL DE REGISTRO CIVIL DAS PESSOAS NATURAIS DO 34º SUBDISTRITO DE  
CERQUEIRA CESAR  
SÃO PAULO - SP  
COMARCA DE SÃO PAULO - ESTADO DE SÃO PAULO  
OFICIAL ADOLFO JOSÉ BASTOS DA CUNHA



pela SSP/SP, e inscrita no CPF/MF sob o nº 137.781.628-10; **RODRIGO INACIO RANGEL DOS SANTOS**, brasileiro, casado, formado em ciência da computação, portador do documento de identidade nº 3009067, expedido pela SSP/GO, e inscrito no CPF/MF sob o nº 796.435.661-53; **ROGERIO AUGUSTO ALTAFINI TRANI**, brasileiro, casado, bacharel em ciências da computação, portador do documento de identidade nº 23.380.101-7, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 182.054.248-37; **ROSENILDA DA COSTA**, brasileira, solteira, tecnóloga em gestão de pessoas, portadora do documento de identidade nº 28.520.860-3, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 291.469.438-54; **RUBENS HIGA**, brasileiro, casado, administrador, portador do documento de identidade nº 177214089, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 056.332.848-79; **RUI SÉRGIO PAVARINO JUNIOR**, brasileiro, casado, advogado, portador do documento de identidade nº 25.082.798-0, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 184.452.858-82; **SANDERSON BENJAMIN ZILIO**, brasileiro, separado, administrador, portador do documento de identidade nº 1046517031, expedido pela SSP/RJ, e inscrito no CPF/MF sob o nº 623.393.110-04; **SÉRGIO FREITAS RODRIGUES DE PAULA**, brasileiro, casado, engenheiro mecânico, portador do documento de identidade nº M8.954.907, expedido pela SSP/MG, e inscrito no CPF/MF sob o nº 038.117.736-07; **SEVERA ALVES CALHEIROS LUCATI**, brasileira, casada, analista de sistema, portadora do documento de identidade nº 263607239, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 009.472.547-06; **SIMONE DOS SANTOS**, brasileira, divorciada, tecnóloga em gestão comercial, portadora do documento de identidade nº 19.663.601-2, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 140.600.838-95; **TATIANE AUGUSTO ALMEIDA DA SILVA**, brasileira, casada, administradora, portadora do documento de identidade nº 297046998, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 286.235.628-01; **TATIANE MACHADO VONA**, brasileira, solteira, formada em marketing, portadora do documento de identidade nº 302944825, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 301.582.368-07; **TATIANE SILVEIRA DE ALMEIDA CAPUSSO**, brasileira, casada, administradora de empresas, portadora do documento de identidade nº 3562064, expedido pela SSP/SC, e inscrita no CPF/MF sob o nº 027.479.039-40; **THIAGO PONTES CAVALCANTE**, brasileiro, solteiro, administrador, portador do documento de identidade nº 20349114, expedido pela SSP/AM, e inscrito no CPF/MF sob o nº 902.518.492-87; **TONI ANGELO DE AGUIAR**, brasileiro, casado, tecnólogo em redes de computadores, portador do documento de identidade nº 340710548, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 276.713.148-97; **VALTER BENTO DE OLIVEIRA**, brasileiro, casado, formado em marketing, portador do documento de identidade nº 30.282.574-5, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 312.852.668-03; **VANIA DINIZ ARAGÃO**, brasileira, casada, secretária executiva, portadora do documento de identidade nº 1584653, expedido pela SSP/DF, e inscrita no CPF/MF sob o nº 806.120.751-68; **VERANA CAUS DE SOUZA**, brasileira, casada, economista, portadora do documento de identidade nº 946446, expedido pela SSP/ES, e inscrita no CPF/MF sob o nº 024.706.877-21; **VERÔNICA ANGÉLICA PEREIRA**, brasileira, solteira, bacharel em direito, portadora do documento de identidade nº 32959414, expedido pela SSP/SP, e inscrita no CPF/MF sob o nº 282.910.758-67; **VIRGINIA DE BRITO LINS**, brasileira, casada, administradora, portadora do documento de identidade nº 1636920, expedido pela SSP/PA, e inscrita no CPF/MF sob o nº 064.502.452-04; **WANDERLEY LOPES JUNIOR**, brasileiro, divorciado, engenheiro, portador do documento de identidade nº 16.373.059-3, expedido pela SSP/SP, e inscrito no CPF/MF sob o nº 082.008.338-01; **WELLINGTON JOSÉ NOGUEIRA LOPES**, brasileiro, casado, engenheiro, portador do documento de identidade nº 22887-D, expedido pelo CREA/MG, e inscrito no CPF/MF sob o nº 345.714.266-15; aos quais conferem poderes para, individualmente, representarem as Outorgantes e suas filiais perante todas as empresas, órgãos e repartições públicas, entidades autárquicas, fundações e sociedades de economia mista nos âmbitos Federal, Estadual e Municipal, sempre no intuito de participar de certames licitatórios presenciais e/ou eletrônicos, inclusive no que se refere a consultas públicas e em casos de chamamentos públicos, podendo assim, ditos procuradores, apresentar documentos, formular lances verbalmente nos pregões presenciais, bem como formular lances eletrônicos, nos pregões eletrônicos, firmar declarações, assinar e apresentar credenciamento, inclusive de terceiros, que neste ato não se confunde com o substabelecimento vedado neste instrumento, propostas de preço e/ou técnica, participar de sessões públicas de habilitação e julgamento da documentação e propostas, formular impugnações e pedidos de esclarecimento, passar recibos, rubrica de documentos, assinatura de listas de presença e atas, adesões a atas de registro de preço, desistência de prazos recursais, registrar ocorrências, submissão de pedido de reconsideração, interposição de recursos e contra-razões, e ofício, vistas dos Processos Administrativos e todo e qualquer documento correlato ao certame, podendo ainda representar perante o Tribunal de Contas da União - TCU, de seus respectivos Estados - TCE e de seus respectivos Municípios - TCM. Fica vedado o substabelecimento. O(s) Outorgado(s) constituído(s) fica(m) ciente(s) de que ao se desligar(em) do quadro da Companhia, do qual faz(em) parte, não mais poderá(ão) exercer quaisquer poderes constantes neste instrumento, ficando sem efeito os atos praticados a partir da data de desligamento, sendo inclusive responsável(is) por perdas e danos causados pelo uso indevido dos poderes revogados em decorrência do desligamento. A presente procuração terá validade de 01 (um) ano a contar desta data. (Processam 131/2018). Emolumentos: R\$ 269,90; Ao Estado: R\$ 76,70; Secretaria da Fazenda: R\$ 52,48; Ministério Público: R\$ 12,96; Fundo Lei 10199/98: R\$ 14,20; Tribunal de Justiça: R\$ 18,52; A Santa Casa: R\$ 2,70; ILS: R\$ 5,76; Total: R\$ 453,22. Guia n. 064/2019. Assim o disse do que dou fé, me pediu que lhe lavrasse este instrumento, o qual lhe sendo feito e lido em voz alta, por estar conforme, outorga, aceita e assina. Eu, (a.) LUIS CARLOS TAVARES DIAS SOARES, Escrevente Autorizado, digitei, li, colhi a(s) assinatura(s), e Eu, (~~ADOLFO JOSÉ BASTOS DA CUNHA~~) DAVID BRENO RODRIGO PACHECO DE OLIVEIRA, DAVID



10282602363118.00035/448-8

SP, 19 SET 2018  
RUA FREI CAVALDO 37 - CONSOLAÇÃO  
SÃO PAULO - SP - CEP: 01307-001  
FONE FAX: (11) 3061-1423





REPÚBLICA FEDERATIVA DO BRASIL  
Estado de São Paulo

MELCON SANCHEZ-FRIERA | ADOLPHO JOSÉ BASTOS DA CUNHA. TRASLADA NA MESMA DATA. EU,  
(a.) LUIS CARLOS TAVARES DIAS SOARES, Escrevente Autorizado, subscrevo e assino em  
público e lido.

Em test. \_\_\_\_\_ da verdade.

**LUIS CARLOS TAVARES DIAS SOARES**  
Escrevente Autorizado

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*[Handwritten signature]*

3.º TABELÃO DE NOTAS - S. PAULO  
AUTENTICAÇÃO  
Edição de Silva Escrivão - Tab. de Aut. -  
Av. SÃO LUIS, 100 L. 2504 - Jd. LUIZ JOSÉ

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REPÚBLICA FEDERAL DO BRASIL

ESTADO DE SÃO PAULO 8610-8

SECRETARIA DA SEGURANÇA PÚBLICA  
INSTITUTO DE IDENTIFICAÇÃO RICARDO MENEZES SALATI

PROIBIDO PLASTIFICAR



Maria Clara P.O Bressan

ASSINATURA DO TITULAR

CARTEIRA DE IDENTIDADE

VALIDA EM TODO O TERRITÓRIO NACIONAL

REGISTRO GERAL 11.091.093-X DATA DE EXPEDIÇÃO 11/SET/2009

NOME MARIA CLARA POIO D OLIVEIRA BRESSAN

FILIAÇÃO MANUEL D OLIVEIRA E ADELINA DA VEIGA POIO

NACIONALIDADE OSASCO - SP DATA DE NASCIMENTO 27/FEV/1961

DOC. ORIGIN OSASCO - SP OSASCO

CC: LV.B119/FLS.25 /N.035807

CPF *01.116.154*

154 Delegado Distrital de Polícia DELEGADO DE POLÍCIA DELEGADO DE POLÍCIA

LEI Nº 7.110 DE 2009

10564X0195191

ATA DE AUTENTICAÇÃO

1961

 <b>REPÚBLICA FEDERATIVA DO BRASIL</b> <b>CADASTRO NACIONAL DA PESSOA JURÍDICA</b>		
NÚMERO DE INSCRIÇÃO <b>02.558.157/0001-62</b> MATRIZ	<b>COMPROVANTE DE INSCRIÇÃO E DE SITUAÇÃO CADASTRAL</b>	DATA DE ABERTURA <b>04/06/1998</b>
NOME EMPRESARIAL <b>TELEFONICA BRASIL S.A.</b>		
TÍTULO DO ESTABELECIMENTO (NOME DE FANTASIA) *****		PORTE <b>DEMAIS</b>
CÓDIGO E DESCRIÇÃO DA ATIVIDADE ECONÔMICA PRINCIPAL <b>61.10-8-01 - Serviços de telefonia fixa comutada - STFC</b>		
CÓDIGO E DESCRIÇÃO DAS ATIVIDADES ECONÔMICAS SECUNDÁRIAS <b>61.10-8-03 - Serviços de comunicação multimídia - SCM</b> <b>61.20-5-01 - Telefonia móvel celular</b> <b>61.20-5-99 - Serviços de telecomunicações sem fio não especificados anteriormente</b> <b>47.52-1-00 - Comércio varejista especializado de equipamentos de telefonia e comunicação</b> <b>77.40-3-00 - Gestão de ativos intangíveis não-financeiros</b> <b>95.21-5-90 - Reparação e manutenção de equipamentos eletroeletrônicos de uso pessoal e doméstico</b> <b>42.21-9-04 - Construção de estações e redes de telecomunicações</b> <b>62.04-0-00 - Consultoria em tecnologia da informação</b> <b>63.11-9-00 - Tratamento de dados, provedores de serviços de aplicação e serviços de hospedagem na internet</b> <b>63.99-2-00 - Outras atividades de prestação de serviços de informação não especificadas anteriormente</b> <b>70.20-4-00 - Atividades de consultoria em gestão empresarial, exceto consultoria técnica específica</b> <b>82.99-7-99 - Outras atividades de serviços prestados principalmente às empresas não especificadas anteriormente</b> <b>74.90-1-04 - Atividades de intermediação e agenciamento de serviços e negócios em geral, exceto imobiliários</b> <b>82.91-1-00 - Atividades de cobranças e informações cadastrais</b> <b>43.21-5-00 - Instalação e manutenção elétrica</b> <b>61.90-6-99 - Outras atividades de telecomunicações não especificadas anteriormente</b> <b>62.09-1-00 - Suporte técnico, manutenção e outros serviços em tecnologia da informação</b> <b>42.21-9-05 - Manutenção de estações e redes de telecomunicações</b> <b>63.19-4-00 - Portais, provedores de conteúdo e outros serviços de informação na internet</b> <b>62.03-1-00 - Desenvolvimento e licenciamento de programas de computador não-customizáveis</b>		
CÓDIGO E DESCRIÇÃO DA NATUREZA JURÍDICA <b>204-6 - Sociedade Anônima Aberta</b>		
LOGRADOURO <b>AV ENGENHEIRO LUIZ CARLOS BERRINI</b>	NÚMERO <b>1376</b>	COMPLEMENTO
CEP <b>04.571-936</b>	BARRIO/DISTRITO <b>CIDADE MONCOES</b>	MUNICÍPIO <b>SAO PAULO</b>
ENDEREÇO ELETRÔNICO <b>TELEFONICA@TELEFONICA.COM</b>		UF <b>SP</b>
ENDEREÇO TELEFÔNICO <b>(11) 3430-0000</b>		TELEFONE
ENTE FEDERATIVO RESPONSÁVEL (EFR) *****		
SITUAÇÃO CADASTRAL <b>ATIVA</b>	DATA DA SITUAÇÃO CADASTRAL <b>30/11/2018</b>	
MOTIVO DE SITUAÇÃO CADASTRAL		
SITUAÇÃO ESPECIAL *****	DATA DA SITUAÇÃO ESPECIAL *****	

Aprovado pela Instrução Normativa RFB nº 1.863, de 27 de dezembro de 2018.

Emitido no dia 30/07/2019 às 11:03:24 (data e hora de Brasília).

Página: 1/2



 <b>REPÚBLICA FEDERATIVA DO BRASIL</b> <b>CADASTRO NACIONAL DA PESSOA JURÍDICA</b>		
NÚMERO DE INSCRIÇÃO <b>02.558.157/0001-62</b> MATRIZ	<b>COMPROVANTE DE INSCRIÇÃO E DE SITUAÇÃO CADASTRAL</b>	DATA DE ABERTURA <b>04/06/1998</b>
NOME EMPRESARIAL <b>TELEFONICA BRASIL S.A.</b>		
CÓDIGO E DESCRIÇÃO DAS ATIVIDADES ECONÔMICAS SECUNDÁRIAS <b>33.29-5-99 - Instalação de outros equipamentos não especificados anteriormente</b> <b>95.11-8-00 - Reparação e manutenção de computadores e de equipamentos periféricos</b> <b>95.12-6-00 - Reparação e manutenção de equipamentos de comunicação</b> <b>80.20-0-01 - Atividades de monitoramento de sistemas de segurança eletrônico</b> <b>33.14-7-10 - Manutenção e reparação de máquinas e equipamentos para uso geral não especificados anteriormente</b> <b>47.51-2-01 - Comércio varejista especializado de equipamentos e suprimentos de informática</b> <b>77.39-0-99 - Aluguel de outras máquinas e equipamentos comerciais e industriais não especificados anteriormente, sem operador</b>		
CÓDIGO E DESCRIÇÃO DA NATUREZA JURÍDICA <b>204-6 - Sociedade Anônima Aberta</b>		
LOGRADOURO <b>AV ENGENHEIRO LUIZ CARLOS BERRINI</b>	NÚMERO <b>1376</b>	COMPLEMENTO
CEP <b>04.571-936</b>	BARRIO/DISTRITO <b>CIDADE MONCOES</b>	MUNICÍPIO <b>SAO PAULO</b>
ENDEREÇO ELETRÔNICO <b>TELEFONICA@TELEFONICA.COM</b>		UF <b>SP</b>
ENDEREÇO TELEFÔNICO <b>(11) 3430-0000</b>		
ENTE FEDERATIVO RESPONSÁVEL (EFR) *****		
SITUAÇÃO CADASTRAL <b>ATIVA</b>	DATA DA SITUAÇÃO CADASTRAL <b>30/11/2018</b>	
MOTIVO DE SITUAÇÃO CADASTRAL		
SITUAÇÃO ESPECIAL *****	DATA DA SITUAÇÃO ESPECIAL *****	

Aprovado pela Instrução Normativa RFB nº 1.863, de 27 de dezembro de 2018.

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Página: 2/2



## Consulta Cadastral

## Cadastro de Contribuintes de ICMS - Cadesp

Consulta    Nome de Ofício    Configuração    Secretarias    Incrições Energia    Proenreges Eletricas    Encerramento

Imprimir

Voltar

<p>IE: 128.383.948.113          CNPJ: 02.558.157/0001-62          Nome Empresarial: TELEFONICA BRASIL S.A.</p>	<p>Situação: Ativo          Data de Incrição no Estado: 05/08/1973          Regime Estadual: RPA          Regime IPI: RPA</p>
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## Empresa - Geral

<p>Nome Empresarial: TELEFONICA BRASIL S.A.          Natureza Jurídica: Sociedade anônima Aberta          Data início da Atividade: 05/08/1973          CNPJ da Matriz: 02.558.157/0001-62</p>	<p>Partes: 00008          Capital Social: R\$ 63.171.413.863,59          Regime Estadual: NORMAL - REGIME PERIÓDICO DE AFUAÇÃO          Data início do regime: 01/07/2008</p>
<p>Regime Especial de IE Única: Sim</p>	<p>Regime Especial de IE Única por Município: Não</p>

## Participantes

CNPJ/CNPJ	Nome	Qualificação	Participação no Cap. Social	Data de Entrada
111.343.630-04	BROWN RODRIGUE PACHECO DE OLIVEIRA	Diretor	-	04/07/2011
<b>Endereço do Participante</b>				
Logradouro: AVENIDA AYRTON SENA		Complemento: ANDAR 3		
Mº: 2308		Bairro: BARRA DA TIJUCA		
CEP: 22.775-083		UF: RJ		
Município: RIO DE JANEIRO				
<b>Contato do Participante</b>				
Telefone: (11)3150-3035		Fax:		
e-mail:				
138.176.358-85	DAVID HILCON SANCHEZ PEREIRA	Diretor	-	27/04/2016
<b>Endereço do Participante</b>				
Logradouro: AVENIDA ENGENHEIRO LUIZ CARLOS BERRIO 1376		Complemento: ANDAR 32		
Mº: 1376		Bairro: CIDADE NOVOES		
CEP: 34.571-935		UF: SP		
Município: SAO PAULO				
<b>Contato do Participante</b>				
Telefone: (11)3430-0000		Fax:		
e-mail: TELEFONICA@TELEFONICA.COM				
007.837.628-92	CHRISTIAN MAURO DEBARA	Presidente	-	07/01/2018
<b>Endereço do Participante</b>				
Logradouro: AVENIDA ENGENHEIRO LUIZ CARLOS BERRIO 1376		Complemento:		
Mº: 1376		Bairro: CIDADE NOVOES		
CEP: 34.571-935		UF: SP		
Município: SAO PAULO				
<b>Contato do Participante</b>				
Telefone: (11)3430-0000		Fax:		
e-mail:				

## Sucessão

## Empresas Sucedidas

Data de Ocorrência	Ocorrência	CNPJ da Sucedida
28/09/2005	-	04.027.547/0035-01
17/10/2008	Incorporação	03.056.714/0001-00
30/12/2009	-	03.498.897/0001-13
03/10/2011	Incorporação	02.558.156/0001-79
01/07/2013	Incorporação	04.088.728/0001-80
08/04/2016	Incorporação	03.426.826/0001-24

## Estabelecimento - Geral

## Nome Fantasia:

CNPJ: 02.338.151/0001-62

IE: 108.383.949.112

NIRE: 35.3.8015883-4

Data de Inscrição no Estado: 05/09/1970

Data Início da DB: 05/09/1970

Situação Cadastral: Ativo

Ocorrência Fiscal: Ativa

Data Início de Situação: 05/09/1970

Tipo de Unidade: -

Formas de Atuação:

## Tributário

Substituto Tributário: Não

CFR: 1150

CPR-ST:

Desde: 04/01/2007

Data Início da CPR: 01/11/2018

**CNAE Principal:** 11.10-8/01 - Serviços de telefonia fixa comutada - STFC

**CNAE Secundárias:** 33.14-7/11 - Manutenção e reparação de máquinas e equipamentos para uso geral não especificados anteriormente

33.29-5/99 - Instalação de outros equipamentos não especificados anteriormente

42.21-6/04 - Construção de estações e redes de telecomunicações

42.21-6/01 - Manutenção de estações e redes de telecomunicações

43.21-5/00 - Instalação e manutenção elétrica

47.53-2/01 - Comércio varejista especializado de equipamentos e suprimentos de informática

47.52-1/00 - Comércio varejista especializado de equipamentos de telefonia e comunicação

61.20-8/03 - Serviços de comunicação multimedial - SOM

61.20-5/01 - Telefonia móvel celular

61.20-5/99 - Serviços de telecomunicações sem fio não especificados anteriormente

61.96-6/99 - Outras atividades de telecomunicações não especificadas anteriormente

72.03-1/00 - Desenvolvimento e licenciamento de programas de computador não-sistemáticos

72.04-0/00 - Consultoria em tecnologia da informação

72.09-1/00 - Suporte técnico, manutenção e outros serviços em tecnologia da informação

83.11-9/00 - Tratamento de dados, provedores de serviços de aplicação e serviços de hospedagem na internet

83.19-4/00 - Portais, provedores de conteúdo e outros serviços de informação na internet

83.99-2/00 - Outras atividades de prestação de serviços de informação não especificadas anteriormente

70.20-4/00 - Atividades de consultoria em gestão empresarial, exceto consultoria técnica específica

74.99-1/04 - Atividades de intermediação e agenciamento de serviços e negócios em geral, exceto imobiliárias

77.34-0/00 - Aluguel de outras máquinas e equipamentos comerciais e industriais não especificados anteriormente, sem operador

77.40-2/00 - Gestão de ativos intangíveis não-financeiros

80.29-0/01 - Atividades de monitoramento de sistemas de segurança eletrônica

82.90-1/00 - Atividades de cópias e informações cadastrais

82.99-7/99 - Outras atividades de serviços prestados principalmente às empresas não especificados anteriormente

95.11-8/00 - Reparação e manutenção de computadores e de equipamentos periféricos

95.12-0/00 - Reparação e manutenção de equipamentos de comunicação

95.21-5/00 - Reparação e manutenção de equipamentos eletroeletrônicos de uso pessoal e doméstico

Data Início do CNAE Prim.: 04/01/2007

Data Início do CNAE Sec.: 10/12/2018

Data Início do CNAE Sec.: 25/07/2016

Data Início do CNAE Sec.: 25/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 10/12/2018

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 04/01/2007

Data Início do CNAE Sec.: 08/03/2013

Data Início do CNAE Sec.: 23/04/2013

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

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Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 10/12/2018

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

Data Início do CNAE Sec.: 29/07/2016

DRT: DRT0-III - SÃO PAULO

Ponto Fiscal: PFD-10 - BULVARI

## Contabilista

CRC: 1PRE266070-9

Nome: CARLOS CESAR MAZUR

Data Início de Contabilista no Estabelecimento: 25/06/2016

CPF/CNPJ: 336.207.640-81

Situação Cadastral: ATIVO

## Endereço e Contato Preferenciais do Contabilista

Tipo: Residência

Logradouro: RUA UBALDO DO AMARAL

Nº: 1414

CEP: 00.890-190

Município: CURITIBA

Telefone: (011)3015-4307

e-mail: carlos.mazur@telefonica.com

Complemento: APTD 303

Bairro: ALTO DA GLÓRIA

UF: PR

Fax:

**Endereço e Contato Não-Preferenciais do Contabilista**

<b>Tipo:</b> Comercial	
<b>Logradouro:</b> RUA ROSA E SILVA 60	<b>Complemento:</b>
<b>Nº:</b> 717	<b>Bairro:</b> SANTA CECILIA
<b>CEP:</b> 01.218-909	<b>UF:</b> SP
<b>Município:</b> SÃO PAULO	<b>Fax:</b>
<b>Telefone:</b> (41)3103-1293	
<b>e-mail:</b> carlos.maur@telefonica.com	

**Endereço do Estabelecimento**

<b>Logradouro:</b> AVENIDA ENGENHEIRO LUIZ CARLOS BERRINI	<b>Complemento:</b>
<b>Nº:</b> 1376	<b>Bairro:</b> CIDADE MONÇÕES
<b>CEP:</b> 04.571-936	<b>UF:</b> SP
<b>Município:</b> SÃO PAULO	
<b>Referência:</b> PROXIMO A RUA FLORIDA	
<b>Data de Início de Entrega:</b> 31/03/2013	

**Contato do Estabelecimento**

<b>Telefone 1:</b> (11)3400-0000	<b>Telefone 2:</b>
<b>Fax:</b>	<b>e-mail:</b> TELEFONICA@TELEFONICA.COM

**Endereço de Correspondência**

<b>Logradouro:</b> AVENIDA ENGENHEIRO LUIZ CARLOS BERRINI	<b>Complemento:</b>
<b>Nº:</b> 1376	<b>Bairro:</b> CIDADE MONÇÕES
<b>CEP:</b> 04.571-936	<b>UF:</b> SP
<b>Município:</b> SÃO PAULO	
<b>Referência:</b> PROXIMO A RUA FLORIDA	



**Prefeitura do Município de São Paulo**

Secretaria Municipal de Finanças

Departamento de Arrecadação e Cobrança

**FDC - Ficha de dados cadastrais**

Cadastro de Contribuintes Mobiliários-CCM

CNPJ: 02.558.157/0001-62

C.C.M. 2.671.449-0

Contribuinte	: TELEFONICA BRASIL S.A.
Pessoa Jurídica	: Comum
Tipo de unidade	: Produtiva
Endereço	: AV ENG. LUIZ CARLOS BERRINI 01376 REMANESCENTE
Bairro	: TORRE B
CEP	: 04571-000
Telefone	: Não Consta
Início de Funcionamento	: 01/01/1995
Data de Inscrição	: 10/02/2000
CCM Centralizador	: Não consta
Tipo de Endereço	: Comercial
Nro. do Contribuinte de IPTU	: 085.641.2218-9
Última Atualização Cadastral	: 24/09/2018



**Prefeitura do Município de São Paulo**

Secretaria Municipal de Finanças

Departamento de Arrecadação e Cobrança

**FDC - Ficha de dados cadastrais**

Cadastro de Contribuintes Mobiliários-CCM

CNPJ: 02.558.157/0001-62

C.C.M: 2.871.449-0

CNAE			
Código	Descrição	Tipo	Data início
4221-9/04	Construção de estações e redes de telecomunicações	Secundário	29/07/2016
4221-9/05	Manutenção de estações e redes de telecomunicações	Secundário	29/07/2016
4321-5/00	Instalação e manutenção elétrica	Secundário	29/07/2016
8110-8/01	Serviços de telefonia fixa comutada - STFC	Principal	01/12/2016
8110-8/03	Serviços de comunicação multimídia - SCM	Secundário	01/12/2016
8204-0/00	Consultoria em tecnologia da informação	Secundário	29/07/2016
8209-1/00	Suporte técnico, manutenção e outros serviços em tecnologia da informação	Secundário	29/07/2016
6311-9/00	Tratamento de dados, provedores de serviços de aplicação e serviços de hospedagem na internet	Secundário	29/07/2016
6319-4/00	Portais, provedores de conteúdo e outros serviços de informação na internet	Secundário	29/07/2016
6399-2/00	Outras atividades de prestação de serviços de informação não especificadas anteriormente	Secundário	29/07/2016
7020-4/00	Atividades de consultoria em gestão empresarial, exceto consultoria técnica específica	Secundário	29/07/2016
7490-1/04	Atividades de intermediação e agenciamento de serviços e negócios em geral, exceto imobiliários	Secundário	29/07/2016
7740-3/00	Gestão de ativos intangíveis não-financeiros	Secundário	29/07/2016
8291-1/00	Atividades de cobrança e informações cadastrais	Secundário	29/07/2016
8299-7/99	Outras atividades de serviços prestados principalmente às empresas não especificadas anteriormente	Secundário	29/07/2016
9521-5/00	Reparação e manutenção de equipamentos eletroeletrônicos de uso pessoal e doméstico	Secundário	29/07/2016



**Prefeitura do Município de São Paulo**

Secretaria Municipal de Finanças

Departamento de Arrecadação e Cobrança

**FDC - Ficha de dados cadastrais**

Cadastro de Contribuintes Mobiliários-CCM

CNPJ: 02.558.157/0001-62

C.C.M: 2.871.449-0

Código(s) de tributo(s)				
Código	Data de Início	Tributo	Alíquota do Imposto	Qtd. Anúncios
1880	29/07/2016	ISS	5	
2151	29/07/2016	ISS	5	
2660	01/02/2018	ISS	2,9	
2664	01/02/2018	ISS	2,9	
2919	01/02/2018	ISS	2,9	
2962	01/02/2018	ISS	2,9	
3093	29/07/2016	ISS	5	
3115	29/07/2016	ISS	5	
3204	29/07/2016	ISS	5	
6297	29/07/2016	ISS	5	
6521	29/07/2016	ISS	5	
6564	29/07/2016	ISS	5	
7285	29/07/2016	ISS	5	
7498	29/07/2016	ISS	5	
30408	29/07/2016	TFE	-	

Expedida em 12/07/2019 **vja Internet** com base na Portaria SF nº 018/2004, de 25 de março de 2004.

A Ficha de Dados Cadastrais (FDC) tem os mesmos efeitos da Declaração Cadastral, informando a condição cadastral mobiliária do contribuinte perante a municipalidade (ativo ou cancelado), além de outros dados cadastrados no órgão fiscal emissor do presente documento, sendo válida por 3 meses a contar da data de emissão.

Código para verificação de autenticidade: **k7BYm3q4**

Data de validade: **12/10/2019**



MINISTÉRIO DA FAZENDA  
Secretaria da Receita Federal do Brasil  
Procuradoria-Geral da Fazenda Nacional

**CERTIDÃO POSITIVA COM EFEITOS DE NEGATIVA DE DÉBITOS RELATIVOS AOS TRIBUTOS  
FEDERAIS E À DÍVIDA ATIVA DA UNIÃO**

Nome: **TELEFONICA BRASIL S.A.**  
CNPJ: **02.558.157/0001-62**

Ressalvado o direito de a Fazenda Nacional cobrar e inscrever quaisquer dívidas de responsabilidade do sujeito passivo acima identificado que vierem a ser apuradas, é certificado que:

1. constam débitos administrados pela Secretaria da Receita Federal do Brasil (RFB) com exigibilidade suspensa nos termos do art. 151 da Lei nº 5.172, de 25 de outubro de 1966 - Código Tributário Nacional (CTN), ou objeto de decisão judicial que determina sua desconsideração para fins de certificação da regularidade fiscal, ou ainda não vencidos, e
2. constam nos sistemas da Procuradoria-Geral da Fazenda Nacional (PGFN) débitos inscritos em Dívida Ativa da União (DAU) com exigibilidade suspensa nos termos do art. 151 do CTN, ou garantidos mediante bens ou direitos, ou com embargos da Fazenda Pública em processos de execução fiscal, ou objeto de decisão judicial que determina sua desconsideração para fins de certificação da regularidade fiscal.

Conforme disposto nos arts. 205 e 206 do CTN, este documento tem os mesmos efeitos da certidão negativa.

Esta certidão é válida para o estabelecimento matriz e suas filiais e, no caso de ente federativo, para todos os órgãos e fundos públicos da administração direta a ele vinculados. Refere-se à situação do sujeito passivo no âmbito da RFB e da PGFN e abrange inclusive as contribuições sociais previstas nas alíneas 'a' a 'd' do parágrafo único do art. 11 da Lei nº 8.212, de 24 de julho de 1991.

A aceitação desta certidão está condicionada à verificação de sua autenticidade na Internet, nos endereços <<http://rfb.gov.br>> ou <<http://www.pgfn.gov.br>>.

Certidão emitida gratuitamente com base na Portaria Conjunta RFB/PGFN nº 1.751, de 2/10/2014.

Emitida às 17:46:17 do dia 30/08/2019 <hora e data de Brasília>.

Válida até 26/02/2020.


Código de controle da certidão: **8E3F.AF7C.79E0.898B**

Qualquer rasura ou emenda invalidará este documento.





GOVERNO DO ESTADO DE SÃO PAULO  
SECRETARIA DA FAZENDA E PLANEJAMENTO  
DELEGACIA REGIONAL TRIBUTÁRIA DA CAPITAL DRTC-III  
Posto Fiscal da Capital – Butantã  
Rua Butantã, 260 térreo – 05424-000 São Paulo - SP  
Tel.: (11) 3093-3700

Certidão DRTC-III, Nº 1411/2019 GDOC 51220-323740/2019	
CNPJ/CPF: 02.558.157/0001-62	
Certifico que INEXISTEM débitos exigíveis de IPVA e ITCMD, antes da inscrição em Dívida Ativa, de responsabilidade do interessado.	
1- A presente certidão só é válida em relação ao interessado. 2- Fica ressalvado o direito à Fazenda do Estado de exigir, a qualquer tempo, créditos tributários que venham a ser apurados. 3- Prazo de Validade da certidão: 06 (seis) meses conforme Portaria CAT 20/1998 (DOE de 02/04/98). 4- Esta certidão não atesta a inexistência de débitos de ICMS.	
Local de Emissão: São Paulo Posto Fiscal da Capital – Butantã	Data da Emissão: 19/06/2019 Responsável:
Alexandre L. S. Pires Agente Fiscal de Rendas	 Alexandre L. S. Pires Agente Fiscal de Rendas Chefe substituto do Posto Fiscal da Capital – Butantã

Alexandre L. S. Pires  
Agente Fiscal de Rendas

Alexandre L. S. Pires  
Agente Fiscal de Rendas  
Chefe substituto do Posto Fiscal da Capital –  
Butantã

3.º TABELÃO DE NOTAS - S. PAULO  
AUTENTICAÇÃO  
Edifício São Francisco - Jd. São Ivo  
TAC 1000 1000 2004 - No. 010/3100-0000

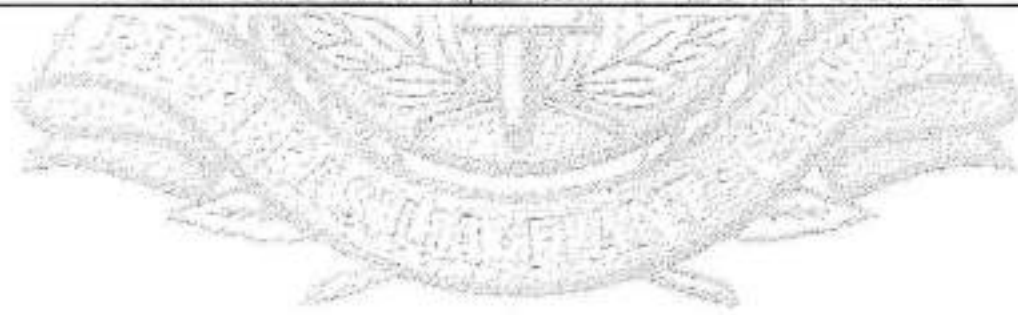
07 SET 2019  
SELOS  
POR  
VERBA





GOVERNO DO ESTADO DE SÃO PAULO  
SECRETARIA DA FAZENDA E PLANEJAMENTO  
DELEGACIA REGIONAL TRIBUTÁRIA DA CAPITAL DRTC-III  
Posto Fiscal da Capital – Butantã  
Rua. Butantã, 260 térreo – 05424-000 São Paulo - SP  
Tel.: (11) 3063-3700

Certidão DRTC-III, Nº 1122/2019 GDOC 51220-262181/2019	
CNPJ/CPF: 02.558.157/0001-62	
Certifico que INEXISTEM débitos exigíveis de ICMS, antes da inscrição em Dívida Ativa, de responsabilidade do interessado.	
1- A presente certidão só é válida em relação ao interessado. 2- Fica ressalvado o direito à Fazenda do Estado de exigir, a qualquer tempo, créditos tributários que venham a ser apurados. 3- Prazo de Validade da certidão: 06 (seis) meses conforme Portaria CAT 20/1998 (DOE de 02/04/98). 4- Esta certidão não atesta a inexistência de débitos de IPVA e ITCMD.	
Local de Emissão: São Paulo Posto Fiscal da Capital – Butantã	Data da Emissão: 15/05/2019 Responsável:
 Alexandre L. S. Pires Agente Fiscal de Rendas	 Oliver de Góes Corrêa Agente Fiscal de Rendas Chefe do Posto Fiscal da Capital – Butantã





# PROCURADORIA GERAL DO ESTADO

## Procuradoria da Dívida Ativa

### Certidão Positiva de Débitos Inscritos na Dívida Ativa

CNPJ BASE: 02558157

Ressalvado o direito de a Fazenda do Estado de São Paulo cobrar ou inscrever quaisquer dívidas da pessoa jurídica/física acima identificada que vierem a ser apuradas, é certificado que:

**Inscritos em Dívida Ativa de responsabilidade do Interessado(a) constam os seguintes débitos tributários:**

Relativos a ICMS Autuação  
Origem: SECRETARIA DA FAZENDA

CNPJ: 02.558.157/0001-62

IE: 108383949112

CDA	Situação
1.001.091.352	Inscrito / Suspenso
1.092.093.312	Inscrito / Suspenso
1.093.419.206	Inscrito / Suspenso
1.218.146.050	Inscrito
1.233.879.400	Inscrito
1.233.974.548	Inscrito / Suspenso
1.251.235.583	Inscrito / Suspenso
1.252.588.037	Inscrito
1.258.533.289	Inscrito
1.258.555.783	Inscrito
1.257.184.410	Inscrito
1.258.242.701	Inscrito
1.261.652.087	Inscrito
1.268.002.830	Inscrito
1.266.389.330	Inscrito
1.268.440.233	Inscrito
1.267.056.733	Inscrito
1.267.432.052	Inscrito

Relativos a IPVA  
Origem: SECRETARIA DA FAZENDA

CNPJ: 02.558.157/0001-62

IE: 108383949112

CDA	Situação
1.265.657.622	Inscrito



Local de emissão : <b>DRTC - I</b>	Responsável : <b>Edilma Cristina O. S. Vieira</b> Supervisora / DEAT/CPA RG: 27.214.248
CRDA nº 22714862	Folha 1 de 3
Data e hora da emissão 02/07/2019 15:16:15 (horário de Brasília)	
Prazo de validade da certidão: 06 (SEIS) mês(es) conforme portaria CAT NR. 20 de 01/04/1998 (DOE de 02/04/1998).	



PROCURADORIA GERAL DO ESTADO  
Procuradoria da Dívida Ativa

Certidão Positiva de Débitos  
Inscritos na Dívida Ativa

CNPJ BASE: 02558157

IE: 108383949112

CDA	Situação
1.265.657.656	Inscrito
1.265.657.722	Inscrito

Relativos a Multa Ipcd

Origem: FUNDAÇÃO DE PROTEÇÃO E DEFESA DO CONSUMIDOR -

CNPJ: 02.558.157/0001-62

IE: 108383949112

CDA	Situação
1.064.704.859	Inscrito
1.062.896.951	Inscrito / Suspenso
1.065.296.596	Inscrito / Suspenso
1.136.125.829	Inscrito / Suspenso
1.136.709.099	Inscrito / Suspenso
1.139.412.435	Inscrito / Suspenso
1.140.929.709	Inscrito / Suspenso
1.219.764.140	Inscrito / Suspenso
1.219.939.802	Inscrito / Suspenso
1.219.950.529	Inscrito / Suspenso
1.224.948.838	Inscrito / Suspenso
1.228.968.664	Inscrito / Suspenso
1.233.670.637	Inscrito / Suspenso
1.257.213.600	Inscrito / Suspenso
1.257.274.741	Inscrito / Suspenso
1.267.308.300	Inscrito
1.267.392.646	Inscrito / Suspenso
1.267.362.737	Inscrito / Suspenso
1.267.363.170	Inscrito / Suspenso

Relativos a Multas

Origem: FUNDAÇÃO DE PROTEÇÃO E DEFESA DO CONSUMIDOR -

CNPJ: 02.558.157/0001-62

IE: 108383949112

CDA	Situação
1.001.711.558	Inscrito / Suspenso

Local de emissão : DRTC - I	Responsável: Edilma Cristina da S. Vieira Supervisora - DEAT/CPA RG: 21.214.246
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CRDA nº 22714662	Folha 2 de 3
Data e hora da emissão 02/07/2019 15:16:18 (horário de Brasília)	
Prazo de validade da certidão: 06 (SEIS) mês(es) conforme portaria CAT NR. 20 de 01/04/1998 (DOE de 02/04/1998).	





PROCURADORIA GERAL DO ESTADO  
Procuradoria da Dívida Ativa

Certidão Positiva de Débitos  
Inscritos na Dívida Ativa

CNPJ BASE: 02558157

IE: 108383949112

CDA	Situação
1.001.720.246	Inscrito / Suspense
1.001.724.584	Inscrito / Suspense
1.004.900.254	Inscrito
1.004.938.220	Inscrito / Suspense
1.006.202.365	Inscrito / Suspense
1.009.888.700	Inscrito / Suspense
1.012.023.000	Inscrito / Suspense
3.529	Inscrito / Suspense
4.342	Inscrito / Suspense

Relativos a Multa (pca)

Origem: FUNDAÇÃO DE PROTEÇÃO E DEFESA DO CONSUMIDOR -

CNPJ: 02.558.157/0001-62

IE:

CDA	Situação
1.239.134.565	Inscrito / Suspense
1.239.149.991	Inscrito / Suspense
1.239.274.087	Inscrito / Suspense
1.239.274.876	Inscrito
1.239.865.300	Inscrito / Suspense
1.240.113.002	Inscrito / Suspense
1.242.316.362	Inscrito / Suspense
1.244.818.960	Inscrito / Suspense
1.245.248.378	Inscrito / Suspense

Anotação SEFAZ:

A CERTIDÃO POSITIVA TEM EFEITO DE NEGATIVA PARA OS DÉBITOS ACIMA CITADOS CONFORME MANIFESTAÇÃO DA D. SUBPROCURADORIA FISCAL PF-5 EXARADA EM 02/07/2019 NO GDOC 1000084-296529/2019. PARA ELABORAÇÃO DA CERTIDÃO FORAM PESQUISADOS TODOS OS DÉBITOS INSCRITOS EM DÍVIDA ATIVA ATÉ A PRESENTE DATA.

Final da Certidão

Local de emissão: DRTC - I	Responsável: Edilma Cristina O. S. Vieira Supervisora - DEAT/DIA RG: 21.314.246
CRDA nº 22714662	Folha 3 de 3
Data e hora da emissão 02/07/2019 15:16:18 (horário de Brasília)	
Prazo de validade da certidão: 06 (SEIS) mês(es) conforme portaria CAT NR. 20 de 01/04/1998 (DOE de 02/04/1998).	





**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

SECRETARIA MUNICIPAL DA FAZENDA

**Certidão Conjunta de Débitos de Tributos Mobiliários**

Certidão Número: 0484953 - 2019

CPF/CNPJ Raiz: 02.558.157/

Contribuinte: TELEFONICA BRASIL S.A.

Liberação: 02/08/2019

Validade: 29/01/2020

Tributos Abrangidos: Imposto Sobre Serviços - ISS  
Taxa de Fiscalização de Localização, Instalação e Funcionamento  
Taxa de Fiscalização de Anúncio - TFA  
Taxa de Fiscalização de Estabelecimento - TFE  
Taxa de Resíduos Sólidos de Serviços de Saúde - TRSS (Incidência a partir de Jan/2011)  
Imposto Sobre Transmissão de Bens Imóveis - ITBI

**Unidades Tributárias:**

CCM 3.871.449-0- Início atv: 01/01/1996 (AV ENG. LUIZ CARLOS BERRINI, 01378 - CEP: 04571-000 )  
CCM 3.179.420-3- Início atv: 01/02/2001 (AV BRIGADEIRO FÁRIA LIMA, 03015 - CEP: 01452-000 - Cancelado em: 07/12/2009)  
CCM 3.201.512-7- Início atv: 04/06/1998 (R CATARINO ANDREATTA, 00056 - CEP: 04786-050 )  
CCM 3.204.336-8- Início atv: 04/06/1998 (ES CORONEL JOSÉ GLADIADOR, 00107 - CEP: 05267-000 )  
CCM 3.328.400-7- Início atv: 01/06/2001 (R TABAPUA, 01499 - CEP: 04533-014 )  
CCM 3.332.161-3- Início atv: 02/01/1994 (AL DOS NHAMBUQUARAS, 00700 - CEP: 04090-001 )  
CCM 3.343.273-2- Início atv: 14/04/2004 (R JOSÉ DÓRIA DE ANDRADE, 00674 - CEP: 08285-340 )  
CCM 3.518.898-3- Início atv: 30/03/2006 (R CATULO DA PAIXÃO CEARENSE, 00544 - CEP: 01045-010 )  
CCM 3.550.739-0- Início atv: 11/11/2005 (AL CAMPINAS, 01070 - CEP: 01404-001 - Cancelado em: 12/06/2013)  
CCM 3.576.658-1- Início atv: 06/05/2000 (R BRIGADEIRO TOBIAS, 00664 - CEP: 01032-001 - Cancelado em: 05/05/2017)  
CCM 3.576.662-0- Início atv: 04/06/1998 (AV VEREADOR JOÃO DE LUCA, 01788 - CEP: 04381-001 )  
CCM 3.576.667-0- Início atv: 26/11/2001 (AV NOSSA SENHORA DO D, 01946 - CEP: 02715-000 )  
CCM 3.576.669-7- Início atv: 30/12/1999 (AV PAULISTA, 02300 - CEP: 01310-300 - Cancelado em: 12/06/2013)  
CCM 3.576.673-5- Início atv: 04/06/1998 (AV ADOLFO PINHEIRO, 00962 - CEP: 04734-002 - Cancelado em: 07/12/2009)  
CCM 3.576.675-1- Início atv: 07/05/2001 (AV AGUIA DE HIAI, 02670 - CEP: 03694-000 )  
CCM 3.576.678-6- Início atv: 23/11/2001 (R TUJUBA, 00820 - CEP: 03608-050 )  
CCM 3.576.682-4- Início atv: 04/06/1998 (AV CARLOS OBERHUBER, 00261 - CEP: 04835-130 )  
CCM 3.576.687-5- Início atv: 04/06/1998 (R CONEJO VICENTE MIGUEL MARINO, 00059 - CEP: 01135-020 - Cancelado em: 23/10/2013)  
CCM 3.576.690-5- Início atv: 25/08/2004 (R ALEXANDRE DUMAS, 02200 - CEP: 04717-004 - Cancelado em: 30/12/2010)  
CCM 3.576.692-1- Início atv: 27/11/2001 (R LUCAS DE FREITAS AZEVEDO, 00047 - CEP: 02046-060 )

Certidão expedida com base na Portaria Conjunta SFP/PM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.691, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 2BF10001

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/sf>



**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

**SECRETARIA MUNICIPAL DA FAZENDA**

**Certidão Conjunta de Débitos de Tributos Mobiliários**

CCM 3.576.694-8- Início atv :04/06/1998 (AV IPIRANGA, 00200 - CEP: 01046-010 - Cancelado em: 02/09/2010)  
CCM 3.576.696-4- Início atv :04/06/1998 (AV GENERAL OLIMPIO DA SILVEIRA, 00046 - CEP: 01150-000 )  
CCM 3.576.698-0- Início atv :01/06/2006 (AV BRIG FARIA LIMA, 01188 - CEP: 01451-001 )  
CCM 3.576.699-9- Início atv :17/04/2002 (R RODRIGUES PAES, 00305 - CEP: 04717-020 )  
CCM 3.576.702-2- Início atv :04/06/1998 (R TRES PEDRAS, 00351 - CEP: 03209-010 )  
CCM 3.576.704-9- Início atv :04/06/1998 (AV ITABERABA, 00141 - CEP: 02734-000 )  
CCM 3.576.834-7- Início atv :09/07/2001 (AV CUPECE, 05280 - CEP: 04366-001 )  
CCM 3.576.835-5- Início atv :04/06/1998 (R DONA ESCOLASTICA M. DA FONSECA, 00644 - CEP: 03513-000 )  
CCM 3.632.471-0- Início atv :04/06/1998 (R BENJAMIM CONSTANT, 00174 - CEP: 01005-000 )  
CCM 3.632.478-7- Início atv :04/06/1998 (R MARTINS FONTES, 00152 - CEP: 01090-000 - Cancelado em: 26/09/2018)  
CCM 3.632.481-7- Início atv :04/06/1998 (R FAGUNDES DIAS, 00034 - CEP: 04855-000 )  
CCM 3.632.485-0- Início atv :04/06/1998 (R FLORES DO PIAUI, 00030 - CEP: 08210-200 )  
CCM 3.632.487-5- Início atv :04/06/1998 (R NSRA DA LAPA, 00114 - CEP: 05072-000 )  
CCM 3.632.492-2- Início atv :04/06/1998 (R BUTANTA, 00215 - CEP: 05294-140 )  
CCM 3.632.494-9- Início atv :04/06/1998 (R VOLUNTARIOS DA PAZ/PIA, 02362 - CEP: 02010-020 )  
CCM 3.632.495-7- Início atv :04/06/1998 (LG TREZE DE MAIO, 00182 - CEP: 04751-000 - Cancelado em: 14/10/2016)  
CCM 3.632.496-5- Início atv :04/06/1998 (AV RAQUEL CHOHFI, 00149 - CEP: 06375-000 )  
CCM 3.632.497-3- Início atv :04/06/1998 (R SETE DE ABRIL, 00309 - CEP: 01043-000 - Cancelado em: 22/08/2012)  
CCM 3.632.502-3- Início atv :04/06/1998 (R SETE DE ABRIL, 00295 - CEP: 01043-000 - Cancelado em: 14/05/2013)  
CCM 3.743.979-0- Início atv :30/03/2006 (R TREZE DE MAIO, 01047 - CEP: 01045-010 )  
CCM 3.743.981-2- Início atv :30/03/2006 (R STA CRUZ, 01922 - CEP: 01045-010 )  
CCM 3.743.982-0- Início atv :30/03/2006 (AV ENG HEITOR ANTONIO EIRAS GARCIA, 01095 - CEP: 05588-001 )  
CCM 3.925.330-9- Início atv :04/06/1998 (AV PARANAGUA, 01790 - CEP: 03806-000 )  
CCM 3.925.331-7- Início atv :04/06/1998 (R SATURNINO PEREIRA, 00206 - CEP: 08411-000 )  
CCM 3.925.332-5- Início atv :04/06/1998 (R FLORES DO PIAUI, 00178 - CEP: 08210-200 - Cancelado em: 26/02/2018)  
CCM 3.925.336-8- Início atv :21/01/1998 (R PROF CLEMENTE PINHO, 00494 - CEP: 04753-100 - Cancelado em: 27/09/2018)  
CCM 3.925.340-6- Início atv :04/06/1998 (R ALM BRASIL, 00200 - CEP: 03049-000 - Cancelado em: 31/12/2009)  
CCM 3.925.341-4- Início atv :04/06/1998 (R CANDAPUI, 00149 - CEP: 03621-000 )  
CCM 3.925.342-2- Início atv :04/06/1998 (AV NORDESTINA, 00156 - CEP: 08011-010 )  
CCM 3.925.344-9- Início atv :04/06/1998 (R SORIANO DE SOUSA, 00042 - CEP: 03086-020 - Cancelado em: 13/09/2018)  
CCM 3.925.347-3- Início atv :04/06/1998 (AV CEL SEZEFREDO FAGUNDES, 01446 - CEP: 02306-002 - Cancelado em: 26/02/2018)  
CCM 3.925.350-3- Início atv :04/06/1998 (R DO ALTO, 00163 - CEP: 02342-000 )  
CCM 3.925.353-8- Início atv :04/06/1998 (AV ANTONIO BUONO, 00116 - CEP: 03382-000 )  
CCM 3.925.355-4- Início atv :04/06/1998 (R JOSE DE ALMEIDA, 01249 - CEP: 02204-000 )  
CCM 3.925.357-0- Início atv :04/06/1998 (R DIAS DA SILVA, 00906 - CEP: 02114-002 )  
CCM 3.925.360-0- Início atv :04/06/1998 (R DO ORATORIO, 03100 - CEP: 03196-000 )  
CCM 3.925.363-5- Início atv :04/06/1998 (AV CASA GRANDE, 00347 - CEP: 03260-000 )

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.691, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às: 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: ZBF1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda: <http://www.prefeitura.sp.gov.br/sf>



**PREFEITURA DE  
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**Certidão Conjunta de Débitos de Tributos Mobiliários**

CCM 3.925.368-6- Início atv: 04/03/1986 (R DR COSTA VALENTE, 00239 - CEP: 03062-000 )  
CCM 3.925.392-9- Início atv: 26/03/2008 (R AMBARE, 00101 - CEP: 08140-004 )  
CCM 3.925.397-0- Início atv: 26/03/2008 (R ANTONIO PONTES, 00115 - CEP: 02065-050 )  
CCM 3.925.399-6- Início atv: 26/03/2008 (R ELEONORA CINTRA, 01100 - CEP: 03337-000 )  
CCM 3.925.403-8- Início atv: 26/03/2008 (R VINTE E CINCO DE JULHO, 00100 - CEP: 04162-050 )  
CCM 3.925.404-6- Início atv: 26/03/2008 (R XAVIER CURADO, 00515 - CEP: 04210-100 - Cancelado em: 14/10/2016)  
CCM 3.925.407-0- Início atv: 26/03/2008 (AV ULTRAMARINO, 01028 - CEP: 02441-001 )  
CCM 3.925.410-3- Início atv: 26/03/2008 (R ANANA, 00747 - CEP: 08032-370 )  
CCM 3.925.413-5- Início atv: 26/03/2008 (R BARRAS DAS PEDRAS, 00013 - CEP: 02262-020 )  
CCM 3.925.414-3- Início atv: 26/03/2008 (R AGOSTINHO GOMES, 01536 - CEP: 04206-000 - Cancelado em: 12/01/2011)  
CCM 3.925.417-8- Início atv: 26/03/2008 (AV RIO DAS PEDRAS, 02190 - CEP: 03452-200 )  
CCM 3.925.420-8- Início atv: 26/03/2008 (R DA MOCCA, 02800 - CEP: 03165-000 )  
CCM 3.925.435-6- Início atv: 28/12/1975 (R ANDRADE NEVES, 00428 - CEP: 05007-020 - Cancelado em: 26/02/2018)  
CCM 3.925.436-4- Início atv: 28/01/1980 (R MOGEIRO, 00303 - CEP: 05208-180 )  
CCM 3.925.440-2- Início atv: 03/08/1992 (R JURUBIM, 00381 - CEP: 05170-100 )  
CCM 3.925.441-0- Início atv: 12/11/1997 (AV ENG GEORGE CORBIER, 00168 - CEP: 04345-000 )  
CCM 3.925.445-3- Início atv: 25/11/1975 (R CD. DEITU, 00751 - CEP: 04741-001 - Cancelado em: 26/02/2018)  
CCM 3.925.447-0- Início atv: 11/09/1987 (R TUPANACTI, 00060 - CEP: 04131-020 )  
CCM 3.925.449-6- Início atv: 18/11/1999 (R CARD. CAQUIORI, 00421 - CEP: 05454-030 )  
CCM 3.925.452-6- Início atv: 01/04/1973 (R FRANCA PINTO, 00616 - CEP: 04016-002 )  
CCM 3.925.454-2- Início atv: 11/02/1984 (PC HENRY LAURENS, 00420 - CEP: 04246-020 - Cancelado em: 26/02/2018)  
CCM 3.925.457-7- Início atv: 23/10/1981 (R RUI AMARAL LEMOS, 00967 - CEP: 05388-070 )  
CCM 3.925.458-5- Início atv: 10/09/1982 (R JOAQUIM MARIA, 00241 - CEP: 04240-170 )  
CCM 3.925.461-5- Início atv: 13/10/1988 (R CUSTODIO SERRAO, 00580 - CEP: 05118-011 )  
CCM 3.925.463-1- Início atv: 22/09/1993 (R MICHIGAN, 01253 - CEP: 04566-002 )  
CCM 3.925.465-8- Início atv: 23/06/1992 (AV EUSEBIO MATOSO, 00500 - CEP: 05423-000 - Cancelado em: 21/09/2009)  
CCM 3.925.467-4- Início atv: 07/12/1993 (AV STO. AMARO, 01411 - CEP: 04505-002 - Cancelado em: 25/08/2009)  
CCM 3.925.468-2- Início atv: 3/01/1994 (R PARAPUA, 01135 - CEP: 02931-001 )  
CCM 3.925.472-0- Início atv: 05/08/1993 (AV DONA BELMIRA MARIN, 04100 - CEP: 04846-000 )  
CCM 3.925.477-1- Início atv: 18/03/1991 (AV ENG HEITOR ANTONIO EIRAS GARCIA, 01095 - CEP: 05588-001 - Cancelado em: 14/05/2013)  
CCM 3.925.480-1- Início atv: 26/12/1978 (R VIEIRA DE MORAIS, 00153 - CEP: 04617-010 )  
CCM 3.925.483-6- Início atv: 01/04/1973 (R INHAUMA, 00168 - CEP: 01139-020 - Cancelado em: 05/05/2017)  
CCM 3.925.486-0- Início atv: 20/07/1992 (R SILVESTRE RODRIGUES, 00090 - CEP: 05849-480 )  
CCM 3.925.489-5- Início atv: 10/07/1992 (R JOSE VERISSIMO DA C. PEREIRA, 00350 - CEP: 04324-050 )  
CCM 3.925.491-7- Início atv: 20/07/1992 (R PDE FELICIANO DOMINGUES, 00373 - CEP: 02985-140 - Cancelado em: 28/07/2017)  
CCM 3.925.492-5- Início atv: 26/07/1992 (R GAL. LUCIDIO DE ARRUDA, 00138 - CEP: 04930-030 )  
CCM 3.925.494-1- Início atv: 31/07/1992 (R COMEN. MIGUEL CALFAT, 00369 - CEP: 04537-081 )

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.891, de 29 de junho de 2006, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 3BF1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda: <http://www.prefeitura.sp.gov.br/sf>





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SECRETARIA MUNICIPAL DA FAZENDA

**Certidão Conjunta de Débitos de Tributos Mobiliários**

- CCM 3.925.495-2- Início atv :21/12/1976 (R JAGUARE, 00350 - CEP: 05344-030 )
- CCM 3.925.503-4- Início atv :06/09/1975 (R BELA CINTRA, 02370 - CEP: 01415-002 )
- CCM 3.925.504-2- Início atv :03/11/1992 (AV MARQ DE SAO VICENTE, 02353 - CEP: 05036-040 )
- CCM 3.925.508-9- Início atv :25/03/2008 (R PARANACITY, 00767 - CEP: 08080-360 )
- CCM 3.925.508-5- Início atv :25/03/2008 (R MONGUBA, 00351 - CEP: 09438-000 )
- CCM 3.925.509-3- Início atv :25/03/2008 (R VICENTE COSTA NOGUEIRA, 00026 - CEP: 08350-430 )
- CCM 3.925.510-7- Início atv :25/03/2008 (AV CANGAIBA, 04481 - CEP: 03711-001 )
- CCM 3.925.512-3- Início atv :25/03/2008 (R IBITIRAMA, 01850 - CEP: 03134-002 )
- CCM 3.925.516-6- Início atv :25/03/2008 (AV RAGUEB CHOHFI, 04510 - CEP: 08875-000 )
- CCM 3.925.517-4- Início atv :26/03/2008 (AV IMIRIM, 01769 - CEP: 02465-200 )
- CCM 3.925.521-2- Início atv :26/03/2008 (R BARBATIMAO, 00009 - CEP: 05044-220 )
- CCM 3.925.523-9- Início atv :26/03/2008 (R GABRIEL PRESTES, 00060 - CEP: 02032-020 )
- CCM 3.925.528-3- Início atv :04/08/1998 (AV PRES. JOAO GOULART, 00381 - CEP: 04621-010 )
- CCM 3.925.530-1- Início atv :04/08/1998 (AV CORONEL SEZEFREDO FAGUNDES, 07973 - CEP: 02367-075 )
- CCM 3.925.532-8- Início atv :04/08/1998 (R AGRIMENSOR SUGAYA, 00156 - CEP: 08260-030 )
- CCM 3.925.533-6- Início atv :18/12/1996 (ES DE ITAPECERICA, 06180 - CEP: 05858-000 )
- CCM 3.925.535-2- Início atv :19/04/1994 (R DESM. ALGELI CORDEIRO FERNANDES, 00209 - CEP: 05758-060 )
- CCM 3.925.540-9- Início atv :10/11/1988 (AV DIOGO GOMES CARNEIRO, 00106 - CEP: 05547-030 )
- CCM 3.925.541-7- Início atv :20/07/1984 (AV DOSTRES RODERES, 00180 - CEP: 05514-000 )
- CCM 3.925.542-5- Início atv :25/08/1999 (R JOAO BOSALDO, 00575 - CEP: 05881-000 )
- CCM 3.925.544-1- Início atv :29/11/1990 (R MARCELINO COELHO, 00430 - CEP: 04939-010 )
- CCM 3.925.547-6- Início atv :08/04/1987 (R JORGE FARES, 00213 - CEP: 05805-040 )
- CCM 3.925.551-4- Início atv :07/03/1997 (R CARLOS PINTO ALVES, 00290 - CEP: 04630-032 )
- CCM 3.925.555-7- Início atv :08/01/1997 (R JUPI, 00236 - CEP: 04755-050 )
- CCM 3.925.557-3- Início atv :04/10/1997 (R JOSE ALVES DE ALMEIDA, 00132 - CEP: 05527-080 )
- CCM 3.925.560-3- Início atv :12/11/1997 (ES DO ALVARENGA, 03968 - CEP: 04474-340 )
- CCM 3.925.561-1- Início atv :07/05/1997 (AV MORUMBI, 06838 - CEP: 05650-002 )
- CCM 3.925.562-0- Início atv :10/01/1994 (R JOSE FUGULIN, 00595 - CEP: 04455-390 )
- CCM 3.925.566-2- Início atv :12/12/1997 (AV ELISIO TEIXEIRA LEITE, 03512 - CEP: 02810-000 )
- CCM 3.925.570-0- Início atv :21/03/1997 (AV NSRA DE SABARA, 01874 - CEP: 04685-002 )
- CCM 3.925.575-1- Início atv :07/07/2000 (AV PAULO GUILGUER REMBERG, 01818 - CEP: 04858-570 )
- CCM 3.925.577-8- Início atv :02/02/2001 (AL CARLOS MARCHAIS, 00099 - CEP: 04845-040 )
- CCM 3.925.579-4- Início atv :25/08/1992 (R PASTORIL DE ALMENARA, 00200 - CEP: 02993-040 - Cancelado em: 26/02/2018)
- CCM 3.925.578-5- Início atv :04/05/1998 (R OLIMPIA MONTANI, 00130 - CEP: 08475-320 )
- CCM 3.930.673-1- Início atv :21/05/1992 (R BARRA DO BATATAL, 00015 - CEP: 04923-050 )
- CCM 3.930.674-0- Início atv :28/01/1980 (R TREZE DE MAIO, 01294 - CEP: 01327-002 )
- CCM 3.930.685-5- Início atv :31/08/1994 (AV STO. AMARO, 01421 - CEP: 04505-002 - Cancelado em: 16/11/2008)

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2016, Decreto 50.691, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 28F1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/ef>



**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

**SECRETARIA MUNICIPAL DA FAZENDA**

**Certidão Conjunta de Débitos de Tributos Mobiliários**

CCM 3.930.888-0- Início atv :29/06/2000 (AV DO CURSINO, 03692 - CEP: 04132-002 )  
CCM 3.935.149-1- Início atv :29/10/1984 (R AMARO DE PONTES, 00190 - CEP: 04890-360 )  
CCM 3.935.152-1- Início atv :11/04/1997 (AV PAULO GUILGUER REIMBERG, 09912 - CEP: 04856-200 )  
CCM 3.936.167-2- Início atv :24/11/1982 (ES ENGENHEIRO MARCILAC, 00000 - CEP: 04893-000 )  
CCM 3.935.156-0- Início atv :21/05/1992 (ES DA BARRAGEM, 00090 - CEP: 04895-020 )  
CCM 3.936.969-2- Início atv :04/06/1998 (R ARROIO ANTUNES, 00030 - CEP: 06472-310 )  
CCM 3.993.028-9- Início atv :24/01/1983 (R DO LIVRAMENTO, 00098 - CEP: 04008-030 - Cancelado em: 05/10/2016)  
CCM 3.993.031-9- Início atv :23/03/1977 (AV MARQ DE SAO VICENTE, 00288 - CEP: 01136-000 - Cancelado em: 14/09/2017)  
CCM 3.993.032-7- Início atv :10/03/1971 (R JUNQUEIRA FREIRE, 00272 - CEP: 01505-020 )  
CCM 3.993.035-1- Início atv :11/08/1982 (AV GIOVANNI GRONCHI, 02726 - CEP: 06651-002 )  
CCM 3.993.036-0- Início atv :02/10/1951 (R IPEROIG, 00486 - CEP: 05016-002 )  
CCM 3.993.037-8- Início atv :21/01/1966 (R SERRA DE BOTUCATU, 01831 - CEP: 03317-001 )  
CCM 3.993.038-4- Início atv :31/12/1999 (R BRIG TOBIAS, 00866 - CEP: 04032-001 )  
CCM 3.993.156-0- Início atv :05/06/1968 (R DR FAUSTO FERRAZ, 00192 - CEP: 01333-030 - Cancelado em: 05/10/2016)  
CCM 3.993.158-7- Início atv :05/03/1921 (R BRIG GALVÃO, 00265 - CEP: 01151-000 )  
CCM 3.993.159-5- Início atv :28/03/1934 (R XAVIER CURADO, 00478 - CEP: 04210-100 - Cancelado em: 29/07/2016)  
CCM 3.993.162-5- Início atv :20/06/2005 (R CLARINDA, 00000 - CEP: 05716-300 )  
CCM 3.993.164-1- Início atv :16/05/1948 (R HUMBERTO I, 00850 - CEP: 04018-033 )  
CCM 3.995.089-1- Início atv :02/12/2005 (AV SENADOR TEOTÔNIO VILELA, 00261 - CEP: 04901-010 )  
CCM 3.996.090-5- Início atv :18/11/1985 (PC AGENTE CICERO, 00000 - CEP: 03002-010 - Cancelado em: 22/11/2010)  
CCM 3.996.093-0- Início atv :15/11/1973 (AV WASHINGTON LUIS, 00000 - CEP: 04626-811 )  
CCM 3.996.094-8- Início atv :31/12/1999 (AV CIDADE JARDIM, 00400 - CEP: 01464-901 - Cancelado em: 23/10/2013)  
CCM 3.996.097-2- Início atv :30/04/2006 (AV MARIA COELHO AGUIAR, 00215 - CEP: 05804-900 )  
CCM 3.996.098-0- Início atv :01/03/2006 (R ALEXANDRE DUMAS, 02200 - CEP: 04717-004 - Cancelado em: 30/12/2011)  
CCM 3.996.101-4- Início atv :01/11/1994 (R DOS INGLESES, 00600 - CEP: 01329-804 - Cancelado em: 23/11/2010)  
CCM 3.996.103-0- Início atv :26/03/1998 (AV MORUMBI, 08668 - CEP: 04703-002 - Cancelado em: 22/11/2010)  
CCM 4.010.206-8- Início atv :04/06/1998 (R GAL OSORIO, 00532 - CEP: 01213-000 )  
CCM 4.012.246-4- Início atv :21/07/1967 (R BELISARIO CAMPANHA, 00040 - CEP: 02521-000 )  
CCM 4.012.251-4- Início atv :17/07/2000 (ES DO MBOI MIRIM, 07968 - CEP: 04948-030 )  
CCM 4.012.252-2- Início atv :01/08/2006 (R ALEXANDRE DUMAS, 02200 - CEP: 04717-004 - Cancelado em: 01/08/2006)  
CCM 4.526.505-9- Início atv :29/07/2016 (AV BOLONHA, 277 - CEP: 05334-000 )  
CCM 4.526.588-7- Início atv :23/03/2012 (AV GIOVANNI GRONCHI, 05819 - CEP: 06724-003 )  
CCM 4.526.582-3- Início atv :23/03/2012 (RV RAPOSO TAVARES, 00000 - CEP: 05576-100 )  
CCM 4.526.544-5- Início atv :23/03/2012 (AV PROFESSOR FRANCISCO MORATO, 02718 - CEP: 05512-300 )  
CCM 4.526.684-0- Início atv :23/03/2012 (AV DAS NACOES UNIDAS, 04777 - CEP: 05477-000 )  
CCM 4.526.715-4- Início atv :23/03/2012 (AV REBOUCAS, 03970 - CEP: 05402-600 )  
CCM 4.526.547-0- Início atv :23/03/2012 (AV DASNACOES UNIDAS, 22540 - CEP: 04795-000 )

Certidão expedida com base na Portaria Conjunta SFIPGM nº 4, de 12 de abril de 2017, Instrução Normativa SFISUREM nº 3, de 6 de abril de 2015, Decreto 50.691, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 2BF1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/sf>



**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

SECRETARIA MUNICIPAL DA FAZENDA

**Certidão Conjunta de Débitos de Tributos Mobiliários**

- CCM 4.526.705-7- Início atv :23/03/2012 (AV PAULISTA, 00854 - CEP: 01310-100 )
- CCM 4.526.553-4- Início atv :23/03/2012 (AV CHUCRI ZAIDAN, 00940 - CEP: 04583-906 )
- CCM 4.526.894-8- Início atv :23/03/2012 (AV CHUCRI ZAIDAN, 00940 - CEP: 04583-906 )
- CCM 4.526.702-2- Início atv :23/03/2012 (AV CHUCRI ZAIDAN, 00902 - CEP: 04583-903 )
- CCM 4.526.803-4- Início atv :23/03/2012 (R DO ROCIO, 00313 - CEP: 04552-000 )
- CCM 4.526.898-0- Início atv :23/03/2012 (AV PRES JUSCELINO KJBITSCHEK, 02041 - CEP: 04643-011 )
- CCM 4.526.872-7- Início atv :23/03/2012 (R OLIMPIADAS, 00380 - CEP: 04551-000 )
- CCM 4.526.875-1- Início atv :23/03/2012 (AV PROFESSOR ABRAAO DE MORAES, 01711 - CEP: 04123-011 )
- CCM 4.526.879-4- Início atv :23/03/2012 (R DOMINGOS DE MORAIS, 02584 - CEP: 04036-100 )
- CCM 4.526.594-1- Início atv :23/03/2012 (R DOUTOR MELO FREIRE, 00000 - CEP: 03106-010 )
- CCM 4.526.662-0- Início atv :23/03/2012 (AV BRIGADEIRO FARIA LIMA, 02232 - CEP: 01489-900 )
- CCM 5.063.755-5- Início atv :23/03/2012 (R FREI CANECA, 00569 - CEP: 01337-001 )
- CCM 4.526.893-0- Início atv :23/03/2012 (AV REG FELJO, 01739 - CEP: 03367-000 )
- CCM 5.064.010-0- Início atv :23/03/2012 (AV JOSE PINHEIROS BORGES, 00000 - CEP: 01307-001 )
- CCM 4.526.053-3- Início atv :23/03/2012 (R DOUTOR JOAO RIBEIRO, 00304 - CEP: 03834-000 )
- CCM 4.526.111-4- Início atv :23/03/2012 (AV DR. FRANCISCO MESQUITA, 01000 - CEP: 03153-001 )
- CCM 4.526.100-9- Início atv :23/03/2012 (R TREZE DE MARÇO, 01547 - CEP: 01327-001 )
- CCM 4.526.056-8- Início atv :23/03/2012 (AV ENG LUIZ CARLOS BERRINI, 01376 - CEP: 04571-000 )
- CCM 4.526.054-1- Início atv :23/03/2012 (AV IB RAPLEIA, 03103 - CEP: 04029-200 )
- CCM 4.526.141-6- Início atv :23/03/2012 (AV ROQUE PETRONI JUNIOR, 01089 - CEP: 04707-900 )
- CCM 4.915.553-6- Início atv :23/03/2012 (TV CASALBUONO, 00120 - CEP: 02047-050 )
- CCM 4.526.557-7- Início atv :23/03/2012 (R MAGALHAES DE CASTRO, 12000 - CEP: 05676-600 )
- CCM 4.526.717-0- Início atv :23/03/2012 (AV Roque Petroni Júnior, 1464 - CEP: 04707-000 )
- CCM 4.526.711-1- Início atv :23/03/2012 (AV INTERLAGOS, 02255 - CEP: 04661-803 )
- CCM 4.526.686-7- Início atv :23/03/2012 (R DR JOAO RIBEIRO, 00304 - CEP: 03834-000 )
- CCM 4.526.104-1- Início atv :23/03/2012 (R DR. BRAULIO GOMES, 00044 - CEP: 01047-020 )
- CCM 4.526.864-4- Início atv :23/03/2012 (R AUGUSTA, 01781 - CEP: 01311-300 )
- CCM 4.526.680-1- Início atv :23/03/2012 (AV ARICANDUVA, 00565 - CEP: 03527-900 )
- CCM 4.526.700-6- Início atv :23/03/2012 (AV ENG LUIZ CARLOS BERRINI, 01376 - CEP: 04571-000 )
- CCM 4.915.556-3- Início atv :23/03/2012 (TV CASALBUONO, 00120 - CEP: 02047-050 )
- CCM 4.526.019-3- Início atv :23/03/2012 (AV HIGIENOPOLIS, 00674 - CEP: 01238-001 )
- CCM 4.526.014-2- Início atv :23/03/2012 (AV BRIGADEIRO LUIS ANTONIO, 01373 - CEP: 01317-001 - Cancelado em: 14/06/2013)
- CCM 4.526.011-8- Início atv :23/03/2012 (R URIEL GASPAR, 90260 - CEP: 03301-000 )
- CCM 4.526.137-8- Início atv :23/03/2012 (AV PAULISTA, 00412 - CEP: 01310-200 )
- CCM 4.526.110-6- Início atv :23/03/2012 (AV PROFESSOR ALFONSO BOVERO, 00052 - CEP: 01254-000 )
- CCM 4.526.105-6- Início atv :23/03/2012 (R CONEGO VICENTE MIGUEL MARINO, 00059 - CEP: 01135-020 - Cancelado em: 01/09/2017)
- CCM 4.526.713-8- Início atv :23/03/2012 (R TURIASSU, 02100 - CEP: 05005-000 )

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.891, de 28 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 2BF1D601

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/sf>



**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

**SECRETARIA MUNICIPAL DA FAZENDA**

**Certidão Conjunta de Débitos de Tributos Mobiliários**

CCM 4.528.055-0- Início atv :23/03/2012 (AV FRANCISCO MATARAZZO, 00000 - CEP: 05003-800 )  
CCM 4.528.016-9- Início atv :23/03/2012 (R XAVIER CURADO, 00473 - CEP: 04210-100 )  
CCM 4.528.020-7- Início atv :23/03/2012 (R XAVIER DE TOLEDO, 00023 - CEP: 01048-100 )  
CCM 4.526.701-4- Início atv :23/03/2012 (AV LEAO MACHADO, 00100 - CEP: 05328-020 )  
CCM 4.525.559-3- Início atv :23/03/2012 (AV MOFARREJ, 01270 - CEP: 05311-000 )  
CCM 4.526.688-9- Início atv :23/03/2012 (AV PROFESSOR ALFONSO BOVERO, 00052 - CEP: 01254-000 )  
CCM 4.526.683-2- Início atv :23/03/2012 (R SETE DE ABRIL, 00285 - CEP: 01043-000 )  
CCM 5.182.002-1- Início atv :25/07/2012 (AV ENGENHEIRO LUIZ CARLOS BERRINI, 01976 - CEP: 04571-000 )  
CCM 4.751.347-0- Início atv :14/02/2013 (R MARTINIANO DE CARVALHO, 00851 - CEP: 01321-001 )  
CCM 5.340.139-5- Início atv :23/07/2015 (AV AGUA FRIA, 00412 - CEP: 02332-000 )  
CCM 5.340.151-4- Início atv :27/07/2015 (R BARRA BONITA, 00053 - CEP: 03073-040 )  
CCM 5.340.154-9- Início atv :28/07/2015 (R FIDALGA, 00811 - CEP: 05433-070 )  
CCM 5.340.150-8- Início atv :30/07/2015 (AV DAS NAÇÕES UNIDAS, 12901 - CEP: 04578-000 )  
CCM 5.340.046-1- Início atv :05/08/2015 (AV DAS NAÇÕES UNIDAS, 12901 - CEP: 04578-000 )  
CCM 5.340.152-2- Início atv :06/08/2015 (R ANTONIO DAS CHAGAS, 01196 - CEP: 04714-002 )  
CCM 5.584.521-1- Início atv :01/01/2016 (R JÚLIO DINIZ, 100 - CEP: 04547-090 )  
CCM 5.584.827-0- Início atv :01/01/2016 (AV DOUTOR CARDOSO DE MELO, 1450 - CEP: 04548-005 )  
CCM 5.584.919-0- Início atv :01/01/2016 (R XAVIER CURADO, 515 - CEP: 04210-100 )  
CCM 5.584.192-9- Início atv :26/09/2016 (R MARTINS FONTES, 152 - CEP: 01059-000 )  
CCM 5.596.497-4- Início atv :05/10/2016 (R DO LIVRAMENTO, 66 - CEP: 04008-030 )  
CCM 5.597.518-2- Início atv :05/10/2016 (R DOUTOR FAUSTO FERRAZ, 172 - CEP: 01333-030 )  
CCM 5.722.193-6- Início atv :05/05/2017 (R Brigadeiro Tobias, 00664 - CEP: 01032-001 )  
CCM 5.722.196-0- Início atv :06/05/2017 (R Inhaúma, 00169 - CEP: 01139-020 )  
CCM 5.783.841-0- Início atv :25/07/2017 (R PDE FELICIANO DOMINGUES, 00373 - CEP: 02665-140 )  
CCM 5.835.911-8- Início atv :14/08/2017 (AV MARQ DE SAO VICENTE, 00286 - CEP: 01139-000 )  
CCM 5.987.081-8- Início atv :26/02/2018 (AV DEL SEZEFREDO FAGUNDES, 01446 - CEP: 02306-002 )  
CCM 5.987.073-7- Início atv :26/02/2018 (R CD DE ITU, 00751 - CEP: 04741-001 )  
CCM 5.987.112-1- Início atv :26/02/2018 (PC HENRY LAURENS, 00420 - CEP: 04247-023 )  
CCM 5.987.047-8- Início atv :26/02/2018 (R ANDRADE NEVES, 00429 - CEP: 05087-020 )  
CCM 5.987.045-1- Início atv :26/02/2018 (R FLORES DO PIAUI, 00178 - CEP: 08210-200 )  
CCM 5.987.111-3- Início atv :26/02/2018 (R PASTORIL DE ALMENARA, 00200 - CEP: 02893-040 )  
CCM 5.125.274-9- Início atv :13/09/2018 (R SORIANO DE SOUSA, 00042 - CEP: 03066-020 )

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.591, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 28F1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/sf>



**PREFEITURA DE  
SÃO PAULO  
FAZENDA**

SECRETARIA MUNICIPAL DA FAZENDA

**Certidão Conjunta de Débitos de Tributos Mobiliários**

Ressalvado o direito de a Fazenda Municipal cobrar e inscrever quaisquer dívidas de responsabilidade do sujeito passivo que vierem a ser apuradas ou que se verifiquem a qualquer tempo, inclusive em relação ao período contido neste documento, relativas a tributos administrados pela Secretaria Municipal da Fazenda e a inscrições em Dívida Ativa Municipal, junto a Procuradoria Geral do Município é certificado que a Situação Fiscal do Contribuinte supra, referente aos créditos tributários inscritos e não inscritos na Dívida Ativa abrangidos por esta certidão, até a presente data é: **REGULAR.**

A aceitação desta certidão está condicionada à verificação de sua autenticidade na Internet, no endereço <http://www.prefeitura.sp.gov.br/cidade/secretarias/fazenda/>. Qualquer rasura invalidará este documento.

**SITUAÇÃO REGULAR**

Certidão expedida com base na Portaria Conjunta SF/PGM nº 4, de 12 de abril de 2017, Instrução Normativa SF/SUREM nº 3, de 6 de abril de 2015, Decreto 50.691, de 26 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010.

Certidão emitida às 13:13:42 horas do dia 02/08/2019 (hora e data de Brasília).

Código de Autenticidade: 28F1D501

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/ef>.



# PREFEITURA DE SÃO PAULO

Secretaria Municipal da Fazenda

## Certidão Conjunta de Débitos de Tributos Imobiliários

Certidão Número:	0000533694-2019
Número do Contribuinte:	085.641.2218-9
Nome do Contribuinte:	INFORMAÇÃO PROTEGIDA POR SIGILO FISCAL
Local do Imóvel:	AV ENG LUIZ CARLOS BERRINI, 01376, REMANESCENTE, TORRE B - CEP: 04571-000
Cep:	04571-000
Liberação:	22/08/2019
Validade:	18/02/2020

Ressalvado o direito de a Fazenda Municipal cobrar e inscrever quaisquer débitos de responsabilidade do sujeito passivo que vierem a ser apurados ou que se verifiquem a qualquer tempo, inclusive em relação ao período contido neste documento, relativas a tributos administrados pela Secretaria Municipal da Fazenda e a inscrições em Dívida Ativa Municipal, junto à Procuradoria-Geral do Município é certificado que a Situação Fiscal do Contribuinte supra, referente ao Imposto Predial e Territorial Urbano, Taxa de Limpeza Pública, Taxa de Conservação de Vias e Logradouros Públicos, Taxa de Combate e Sinistros e Contribuição de Melhoria incidentes sobre o imóvel acima identificado inscritos e não inscritos na Dívida Ativa até a presente data é: **REGULAR**. . **CONSTAM DÉBITOS RELATIVOS A NL-3 DE 2006 A 2009, VINCULADOS A ÁREA MAIOR QUE LHE DEU ORIGEM PELO SQL 085.641.0116-5, CUJA EXIGIBILIDADE ENCONTRA-SE SUSPensa, CONFORME DECISÃO JUDICIAL, PROCESSO 1047976-65.2016.8.26.0053, DA 6ª VFP (PGM FISC, SF DEPAC, SEI 6017.2019/0044549-1).** .

A aceitação desta certidão está condicionada à verificação de sua autenticidade na Internet, no endereço <http://www.prefeitura.sp.gov.br/cidade/secretarias/fazenda/>. Qualquer rasura invalidará este documento.

Certidão expedida com base na Portaria Conjunta BF/PGM nº 4, de 12 de abril de 2017, Decreto 50.091, de 29 de junho de 2009, Decreto 51.714, de 13 de agosto de 2010 e Portaria SF nº 4, de 05 de janeiro de 2012.

Certidão emitida às 10:17:35 horas do dia 26/08/2019 (hora e data de Brasília)

Código de autenticidade: 0180042F

A autenticidade desta certidão deverá ser confirmada na página da Secretaria Municipal da Fazenda <http://www.prefeitura.sp.gov.br/sf>

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### Certificado de Regularidade do FGTS - CRF

**Inscrição:** 02.558.157/0001-62  
**Razão Social:** TELEFONICA BRASIL SA  
**Endereço:** AV ENGENHEIRO LUIZ CARLOS BERRINI 1376 / CIDADE MONCOES / SAO PAULO /  
SP / 04571-011

A Caixa Econômica Federal, no uso da atribuição que lhe confere o Art. 7, da Lei 8.036, de 11 de maio de 1990, certifica que, nesta data, a empresa acima identificada encontra-se em situação regular perante o Fundo de Garantia do Tempo de Serviço - FGTS.

O presente Certificado não servirá de prova contra cobrança de quaisquer débitos referentes a contribuições e/ou encargos devidos, decorrentes das obrigações com o FGTS.

Emitido em atendimento a determinação judicial.

**Validade:** 19/08/2019 a 17/09/2019

**Certificação Número:** 2019081911434809379350

Informação obtida em 20/08/2019 14:20:55

A utilização deste Certificado para os fins previstos em Lei esta condicionada a verificação de autenticidade no site da Caixa: [www.caixa.gov.br](http://www.caixa.gov.br)



PODER JUDICIÁRIO  
JUSTIÇA DO TRABALHO

**CERTIDÃO POSITIVA DE DÉBITOS TRABALHISTAS  
COM EFEITO DE NEGATIVA**

Nome: TELEFONICA BRASIL S.A.

(MATRIZ E FILIAIS) CNPJ: 02.558.157/0001-62

Certidão n°: 183012286/2019

Expedição: 09/09/2019, às 10:21:56

Validade: 06/03/2020 - 180 (cento e oitenta) dias, contados da data de sua expedição.

Certifica-se que **TELEFONICA BRASIL S.A.**  
(MATRIZ E FILIAIS), inscrito(a) no CNPJ sob o n°  
02.558.157/0001-62, CONSTA do Banco Nacional de Devedores  
Trabalhistas em face do inadimplemento de obrigações estabelecidas  
no(s) processo(s) abaixo, com débito garantido ou exigibilidade  
suspensa:

0011678-17.2014.5.01.0026 - TRT 01ª Região \*

0115608-92.2007.5.01.0027 - TRT 01ª Região \*

0011449-25.2015.5.01.0050 - TRT 01ª Região \*

0010000-33.2007.5.01.0302 - TRT 01ª Região \*

0012800-73.2003.5.02.0002 - TRT 02ª Região \*\*

0171000-41.2004.5.02.0004 - TRT 02ª Região \*

0058700-57.2003.5.02.0006 - TRT 02ª Região \*\*

0109300-50.2007.5.02.0007 - TRT 02ª Região \*

0164400-51.2002.5.02.0011 - TRT 02ª Região \*

0121200-29.2009.5.02.0017 - TRT 02ª Região \*

0064800-02.2007.5.02.0018 - TRT 02ª Região \*\*

0001137-55.2012.5.02.0021 - TRT 02ª Região \*

0151400-81.2003.5.02.0032 - TRT 02ª Região \*\*

0045700-48.2005.5.02.0032 - TRT 02ª Região \*\*

0178500-40.2005.5.02.0032 - TRT 02ª Região \*

0256200-79.2002.5.02.0038 - TRT 02ª Região \*\*

0085100-09.2009.5.02.0039 - TRT 02ª Região \*

0000274-24.2012.5.02.0046 - TRT 02ª Região \*

0239000-76.2005.5.02.0063 - TRT 02ª Região \*\*

0214400-83.2008.5.02.0063 - TRT 02ª Região \*\*

0187800-88.2009.5.02.0063 - TRT 02ª Região \*\*

1001764-68.2016.5.02.0064 - TRT 02ª Região \*

0105300-40.2006.5.02.0072 - TRT 02ª Região \*\*

0156900-95.2009.5.02.0072 - TRT 02ª Região \*\*

0187200-40.2009.5.02.0072 - TRT 02ª Região \*\*

0193500-83.2007.5.02.0073 - TRT 02ª Região \*



PODER JUDICIÁRIO  
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0476400-52.2006.5.02.0081 - TRT 02ª Região \*

0000766-58.2010.5.02.0087 - TRT 02ª Região \*\*

0195000-42.2007.5.02.0088 - TRT 02ª Região \*\*

0000502-64.2012.5.02.0089 - TRT 02ª Região \*\*

0129700-28.2005.5.02.0372 - TRT 02ª Região \*

0000650-87.2010.5.02.0431 - TRT 02ª Região \*

0062500-54.2006.5.02.0441 - TRT 02ª Região \*\*

0126400-73.2007.5.04.0003 - TRT 04ª Região \*

0100200-33.2006.5.04.0013 - TRT 04ª Região \*

0043400-44.2004.5.04.0016 - TRT 04ª Região \*

0000824-26.2010.5.04.0016 - TRT 04ª Região \*

0078500-60.2009.5.04.0024 - TRT 04ª Região \*

0001118-34.2013.5.04.0029 - TRT 04ª Região \*

0000169-76.2013.5.04.0104 - TRT 04ª Região \*

0002039-24.2011.5.04.0203 - TRT 04ª Região \*

0020017-80.2017.5.04.0404 - TRT 04ª Região \*

0000540-46.2012.5.04.0663 - TRT 04ª Região \*

0000541-31.2012.5.04.0663 - TRT 04ª Região \*

0000356-77.2015.5.05.0010 - TRT 05ª Região \*

0000590-56.2015.5.05.0011 - TRT 05ª Região \*

0000467-37.2011.5.05.0031 - TRT 05ª Região \*

0043300-20.2009.5.05.0038 - TRT 05ª Região \*

0001957-21.2016.5.07.0013 - TRT 07ª Região \*

0952900-13.2009.5.09.0011 - TRT 09ª Região \*

0001316-10.2015.5.09.0014 - TRT 09ª Região \*

0000150-85.2016.5.09.0020 - TRT 09ª Região \*

0000027-63.2016.5.09.0513 - TRT 09ª Região \*

0000468-49.2013.5.09.0513 - TRT 09ª Região \*

0049600-06.2004.5.15.0002 - TRT 15ª Região \*\*

0047100-61.2004.5.15.0003 - TRT 15ª Região \*

0080700-39.2005.5.15.0003 - TRT 15ª Região \*\*

0020600-06.2005.5.15.0008 - TRT 15ª Região \*

0069300-96.2008.5.15.0011 - TRT 15ª Região \*

0144200-23.2003.5.15.0012 - TRT 15ª Região \*\*

0115300-42.2008.5.15.0016 - TRT 15ª Região \*

0186400-86.2001.5.15.0021 - TRT 15ª Região \*

0073300-80.2006.5.15.0021 - TRT 15ª Região \*

0070400-28.2005.5.15.0032 - TRT 15ª Região \*

0201100-93.2004.5.15.0043 - TRT 15ª Região \*

0136500-20.2005.5.15.0046 - TRT 15ª Região \*

0107800-87.2003.5.15.0051 - TRT 15ª Região \*

0043000-16.2004.5.15.0051 - TRT 15ª Região \*



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0101400-23.2004.5.15.0051 - TRT 15ª Região \*

0000150-74.2014.5.15.0057 - TRT 15ª Região \*\*

0183900-39.2006.5.15.0064 - TRT 15ª Região \*

0164900-76.2008.5.15.0066 - TRT 15ª Região \*

0000146-68.2014.5.15.0079 - TRT 15ª Região \*

0011449-74.2017.5.15.0079 - TRT 15ª Região \*

0117200-73.2001.5.15.0091 - TRT 15ª Região \*

0169400-17.2002.5.15.0093 - TRT 15ª Região \*

0161500-75.2005.5.15.0093 - TRT 15ª Região \*

0180700-70.2002.5.15.0094 - TRT 15ª Região \*\*

0015500-06.2005.5.15.0094 - TRT 15ª Região \*

0131200-66.2001.5.15.0095 - TRT 15ª Região \*

0147200-73.2003.5.15.0095 - TRT 15ª Região \*

0031100-92.2004.5.15.0097 - TRT 15ª Região \*

0102000-28.2003.5.15.0100 - TRT 15ª Região \*

0140200-67.2004.5.15.0101 - TRT 15ª Região \*

0000770-70.2013.5.15.0106 - TRT 15ª Região \*

0006200-23.2006.5.15.0114 - TRT 15ª Região \*

0129300-07.2005.5.15.0128 - TRT 15ª Região \*

0054700-08.2007.5.15.0140 - TRT 15ª Região \*\*

0055400-81.2007.5.15.0140 - TRT 15ª Região \*

0056200-12.2007.5.15.0140 - TRT 15ª Região \*\*

0056700-78.2007.5.15.0140 - TRT 15ª Região \*\*

0056900-85.2007.5.15.0140 - TRT 15ª Região \*

0902600-22.2005.5.15.0140 - TRT 15ª Região \*\*

0908900-97.2005.5.15.0140 - TRT 15ª Região \*\*

0000804-07.2013.5.15.0151 - TRT 15ª Região \*

0001802-73.2016.5.17.0131 - TRT 17ª Região \*\*

0171600-59.2007.5.20.0003 - TRT 20ª Região \*\*

\* Débito garantido por depósito, bloqueio de numerário ou penhora de bens suficientes.

\*\* Débito com exigibilidade suspensa.

**Total de processos: 97.**

Certidão emitida com base no art. 642-A da Consolidação das Leis do Trabalho, acrescentado pela Lei n° 12.440, de 7 de julho de 2011, e na Resolução Administrativa n° 1470/2011 do Tribunal Superior do Trabalho, de 24 de agosto de 2011.

Os dados constantes desta Certidão são de responsabilidade dos Tribunais do Trabalho e estão atualizados até 2 (dois) dias anteriores à data da sua expedição.

No caso de pessoa jurídica, a Certidão atesta a empresa em relação a todos os seus estabelecimentos, agências ou filiais.



PODER JUDICIÁRIO  
JUSTIÇA DO TRABALHO

A aceitação desta certidão condiciona-se à verificação de sua autenticidade no portal do Tribunal Superior do Trabalho na Internet (<http://www.tst.jus.br>).

Certidão emitida gratuitamente.

**INFORMAÇÃO IMPORTANTE**

A Certidão Positiva de Débitos Trabalhistas, com os mesmos efeitos da negativa (art. 642-A, § 2º, da Consolidação das Leis do Trabalho), atesta a existência de registro do CPF ou do CNPJ da pessoa sobre quem versa a certidão no Banco Nacional de Devedores Trabalhistas, cujos débitos estejam com exigibilidade suspensa ou garantidos por depósito, bloqueio de numerário ou penhora de bens suficientes.



30/08/2019

5031226

**PODER JUDICIÁRIO**  
TRIBUNAL DE JUSTIÇA DO ESTADO DE SÃO PAULO  
CERTIDÃO ESTADUAL DE DISTRIBUIÇÕES CÍVEIS

CERTIDÃO Nº: 6305261

FOLHA: 1/1

A autenticidade desta certidão poderá ser confirmada pela internet no site do Tribunal de Justiça.

A Diretoria de Serviço Técnico de Informações Cíveis do(a) Comarca de São Paulo - Capital, no uso de suas atribuições legais,

**CERTIFICA E DÁ FÉ** que, pesquisando os registros de distribuições de **PEDIDOS DE FALÊNCIA, CONCORDATAS, RECUPERAÇÕES JUDICIAIS E EXTRAJUDICIAIS**, anteriores a 29/08/2019, verificou **NADA CONSTAR** como réu/requerido/interessado em nome de: \*\*\*\*\*

**TELEFÔNICA BRASIL S.A**, CNPJ: 02.558.157/0001-62, conforme indicação constante do pedido de certidão.\*\*\*\*\*

TRIBUNAL DE JUSTIÇA

Esta certidão não aponta ordinariamente os processos em que a pessoa cujo nome foi pesquisado figura como autor (a). São apontados os feitos com situação em tramitação já cadastrados no sistema informatizado referentes a todas as Comarcas/Foros Regionais e Distritais do Estado de São Paulo.

A data de informatização de cada Comarca/Foro pode ser verificada no Comunicado SPI nº 22/2019.

Esta certidão considera os feitos distribuídos na 1ª Instância, mesmo que estejam em Grau de Recurso.

Não existe conexão com qualquer outra base de dados de instituição pública ou com a Receita Federal que verifique a identidade do **NOME/RAZÃO SOCIAL** com o CPF/CNPJ. A conferência dos dados pessoais fornecidos pelo pesquisado é de responsabilidade exclusiva do destinatário da certidão.

A certidão em nome de pessoa jurídica considera os processos referentes à matriz e às filiais e poderá apontar feitos de homônimos não qualificados com tipos empresariais diferentes do nome indicado na certidão (EIRELI, S/C, S/S, EPP, ME, MEI, LTDA).

Esta certidão só tem validade mediante assinatura digital.

Esta certidão é sem custas.

São Paulo, 30 de agosto de 2019.

PEDIDO Nº:

5031226





TRIBUNAL DE JUSTIÇA DO ESTADO DE SÃO PAULO  
Secretaria da Primeira Instância  
SPI 3 - Diretoria de Apoio Técnico

Rua Dr. João 285 - 12º andar - Sala 2017 - Fone: 4623-8026 - CEP: 01033-900 - São Paulo - SP





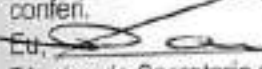
**MARINELE FEITOSA GUIMARÃES PAVÃO**, Diretora de Apoio Técnico da Secretaria da Primeira Instância do Tribunal de Justiça do Estado de São Paulo - SPI 3, atendendo a solicitação de

TELEFÔNICA BRASIL S/A  
CNPJ 02.558.157/0001-62

**CERTIFICA** para fins de Licitação Pública que as certidões de distribuição cível na Comarca de São Paulo são expedidas unicamente pelo Serviço de Certidão Estadual Cível - SCECV, nos termos da Portaria nº 9.614/2018, de 16/05/2018, atual denominação do Serviço Técnico de Informações Cíveis da Comarca de São Paulo, em face da unificação dos Cartórios de Distribuição Cível. **CERTIFICA** que são considerados em geral para a expedição de certidões todos os feitos em andamento cadastrados no sistema informatizado referentes a todas as Comarcas, Foros Regionais e Distritais do Estado de São Paulo, nos termos do Comunicado SPI nº 22/2019. **CERTIFICA FINALMENTE** que, desde 05/05/2016, as certidões de distribuição cível, solicitadas pela internet e presencialmente, passaram a ter assinatura digital, nos termos do Comunicado SPI nº 23/2016. **NADA MAIS**. O referido é verdade e dá fé.

Prazo de validade desta certidão: 90 dias

São Paulo, 20 de Agosto de 2019.

Eu,  (GILMAR BARBOSA DE MELO) Escrevente digital.  
Eu,  (SELMA APARECIDA PIMENTEL) Chefe de Seção Judiciário,  
conferi.  
Eu,  (MARINELE FEITOSA GUIMARÃES PAVÃO) Diretora de Apoio Técnico da Secretaria da Primeira Instância - SPI 3, subscrevi.

Esta certidão é sem custas

















Telefônica Brasil S.A. Companhia Aberta

CNPJ nº 06.958.370/0001-60 - IPRJ nº 3.000.000-4

BALANÇOS PATRIMONIAIS

Em 31 de dezembro de 2018 e 2017 (Em milhões de reais)

Table with columns for Contribuições and Consórcios for 2018 and 2017. Rows include ATIVO Circulante, ATIVO Não Circulante, PASSIVO Circulante, and PASSIVO Não Circulante. Total ATIVO and Total do Passivo e Patrimônio Líquido are 32.496.278 for 2018 and 32.496.278 for 2017.

DEMONSTRAÇÕES DOS RESULTADOS

Exercício findo em 31 de dezembro de 2018 e 2017 (Em milhões de reais, exceto o lucro líquido por ação)

Table with columns for Contribuições and Consórcios for 2018 and 2017. Rows include Receita operacional líquida, Despesas operacionais, Resultado líquido, and Lucro líquido de exercício. Total Resultado líquido is 2.020.278 for 2018 and 2.020.278 for 2017.

DEMONSTRAÇÕES DOS FLUXOS DE CAIXA

Exercício findo em 31 de dezembro de 2018 e 2017 (Em milhões de reais)

Table with columns for Contribuições and Consórcios for 2018 and 2017. Rows include Fluxo de caixa das atividades operacionais, Fluxo de caixa das atividades de investimento, and Fluxo de caixa das atividades de financiamento. Total Fluxo de caixa é líquido é 1.480.000 for 2018 and 1.480.000 for 2017.

DEMONSTRAÇÕES DOS RESULTADOS ADIACIONAIS

Exercício findo em 31 de dezembro de 2018 e 2017 (Em milhões de reais)

Table with columns for Contribuições and Consórcios for 2018 and 2017. Rows include Lucro líquido de exercício, Outros resultados abrangentes líquidos que podem ser reclassificados para resultado em períodos subsequentes, and Resultado líquido de exercício. Total Resultado líquido de exercício é 2.020.278 for 2018 and 2.020.278 for 2017.

DEMONSTRAÇÕES DO VALOR ADICIONADO

Exercício findo em 31 de dezembro de 2018 e 2017 (Em milhões de reais)

Table with columns for Contribuições and Consórcios for 2018 and 2017. Rows include Receita, Despesas, Resultado líquido, and Lucro líquido de exercício. Total Lucro líquido de exercício é 2.020.278 for 2018 and 2.020.278 for 2017.



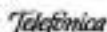
Página do Diário Oficial certificada pela Imprensa Oficial do Estado de São Paulo em 20/02/2019 07:20:06. Nº de Série de Certificação: 2F8FF31F8E627C48A868D16832199C9108C [Estat: 20090101] - www.imprensaoficial.com.br











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Companhia Aberta

CNPJ nº 07.388.197/0001-60 - MEF: 30.1301/001-4

NOTAS EXPLICATIVAS ÀS DEMONSTRAÇÕES FINANCEIRAS

Exercícios findos em 31 de dezembro de 2013 e 2012 (em milhares de reais, exceto quando mencionado de outra forma)

10 Demonstração

Table with 3 columns: Descrição, 2013, 2012. Rows include: Máquinas para vendas, Máquinas para escritório, Outros ativos, Equipamentos, Passivos estimados para redução ao valor realizable e contabilidade fiscal.

O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso. O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso.

11 DESPESAS ANTICIPADAS

11.1 Despesas antecipadas

Ativos antecipados pelas despesas relacionadas a serviços contratados e ainda não realizados. As despesas antecipadas são registradas em razão de serviços que os serviços relacionados são prestados e de natureza econômica não financeira.

11.2 Demonstração

Table with 3 columns: Descrição, 2013, 2012. Rows include: Propaganda e publicidade, Depósitos, Manutenção de ativos e bens, Outros instrumentos - FRS 16 (IAS 16), Arrendamentos financeiros, Preços, Tributos e outras despesas antecipadas, Totais, Contábil, Não classificados.

12 IMPOSTOS DE RENDA E CONTRIBUIÇÃO SOCIAL

12.1 Impostos de renda

Ativos e passivos tributários decorrentes de transações comerciais que se espera recuperar ou pagar às autoridades fiscais. As atividades e a legislação tributária utilizadas no cálculo das mencionadas montantes são aquelas que estão em vigor, no momento em que as demonstrações financeiras foram elaboradas.

12.2 Tributos diferidos

Tributos diferidos ativos são reconhecidos para todos os diferimentos tributários de lucros, custos e perdas fiscais não utilizados, no momento em que não há mais provável que o lucro fiscal seja disponível para que as diferenças temporárias diferidas possam ser utilizadas, exceto se quando o lucro fiscal não é mais recuperado em uma transação de natureza e no momento em que não há mais provável que o lucro fiscal seja disponível para que as diferenças temporárias diferidas possam ser utilizadas, exceto se quando o lucro fiscal não é mais recuperado em uma transação de natureza e no momento em que não há mais provável que o lucro fiscal seja disponível para que as diferenças temporárias diferidas possam ser utilizadas.

O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso. O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso.

O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso. O valor contábil das máquinas e equipamentos é baseado em uma avaliação de mercado em cada data de encerramento do exercício e é baseado no histórico em que não há mais provável que sejam recuperados através da venda ou do uso.

Table with 3 columns: Descrição, 2013, 2012. Rows include: Imposto de renda, Contribuição social, Total.

12.3 Imposto de renda e contribuição social a receber

Table with 3 columns: Descrição, 2013, 2012. Rows include: Imposto de renda, Contribuição social, Total.

13 Imposto de renda e contribuição social diferidos

Demonstração composta de imposto de renda ("IR") e contribuição social ("CS") diferidos são apresentados a seguir:

Main table with 10 columns: Descrição, Saldo em 31.12.13, Demonstração 2013, Resultados 2013, Saldo em 31.12.12, Demonstração 2012, Resultados 2012, Transferência (2013.1.1), Efeito da adoção de IFRS 8 e 15, Saldo em 31.12.13. Rows include: Ativos antecipados, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários.

Main table with 10 columns: Descrição, Saldo em 31.12.13, Demonstração 2013, Resultados 2013, Saldo em 31.12.12, Demonstração 2012, Resultados 2012, Transferência (2013.1.1), Efeito da adoção de IFRS 8 e 15, Saldo em 31.12.13. Rows include: Ativos antecipados, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários, Ativos e passivos tributários.

(1) Tributos e impostos antecipados, que se referem a legislação tributária brasileira, podem ser compensados no limite de 30% das bases apuradas no primeiro exercício sem prazo de prescrição. A realização controla por ocasião do pagamento das atividades de ativos e passivos tributários diferidos em relação ao imposto de renda e contribuição social de acordo com a legislação dos tributos, bem como pela reversão de custos acumulados.

(2) Tributos e impostos diferidos decorrentes de diferenças temporárias, são custos e receitas diferidas, mas de natureza de transações comerciais, exceto tributos.

(3) Em 31 de dezembro de 2012, não foram reconhecidos custos diferidos ativos ou passivos tributários diferidos e CS sobre base negativa e IR sobre base negativa em razão de diferenças temporárias de natureza econômica não financeira.



Página do Diário Oficial registrada pela Imprensa Oficial do Estado de São Paulo em 20/02/2014 07:28:54. Nº de Série de Registro: 2129885288141408103071798013023F14. [Fiscal: 0069110] - www.imprensaoficial.com.br



contingência

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Empresa Aberta  
CNPJ nº 02.948.373/0001-07 - NIRE nº 35.1.011881-4

NOTAS EXPLICATIVAS ÀS DEMONSTRAÇÕES FINANCEIRAS

Demonstrações Financeiras em 31 de dezembro de 2014 e 2013 (Composição de Balanço, Balanço Patrimonial e Demonstração de Resultados)

A seguir, apresentamos as notas explicativas de informações das Demonstrações Financeiras, baseadas em princípios que podem sofrer alterações no futuro.

Table with columns: Ano, Descrição, 2014, 2013. Rows include: Imposto sobre Circulação de Mercadorias e sobre Prestações de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação (ICMS), Contribuição Previdenciária, Seguro Acidente de Trabalho (SAT) e Veículo, Imposto de Renda (IRPJ) e Imposto de Renda sobre a Força (IRPF), Programa de Integração Social (PIS) e Contribuição para o Financiamento da Seguridade Social (COFINS), Outros impostos, taxas e contribuições.

Table with columns: Descrição, 2014, 2013. Rows include: Contribuição de Intervenção no Domínio Econômico (CIDE), Imposto sobre Circulação de Mercadorias e sobre Prestações de Serviços de Transporte Interestadual e Intermunicipal e de Comunicação (ICMS), Contribuição Previdenciária, Seguro Acidente de Trabalho (SAT) e Veículo, Imposto de Renda (IRPJ) e Imposto de Renda sobre a Força (IRPF), Programa de Integração Social (PIS) e Contribuição para o Financiamento da Seguridade Social (COFINS), Outros impostos, taxas e contribuições.

1) Reconhecimento de despesas de impostos de renda e sobre lucros e dividendos: A Companhia e suas controladas provisionam as parcelas para impostos de renda e contribuição social sobre o lucro líquido, considerando o regime de competência, reconhecendo as diferenças por estatísticas, conforme em demonstrações financeiras são preparadas no regime de caixa.

A seguir, apresentamos em uma breve descrição dos principais aspectos jurídicos relevantes: Contribuição à Empresa Brasileira de Comunicação (EBCC). O Estado de São Paulo e o Município de São Paulo, através de suas respectivas Câmaras Municipais de Administração Tributária, instituíram a EBCC, entidade sem fins lucrativos, para a prestação de serviços de radiodifusão sonora e de sons e imagens.

2) Imposto de Renda sobre Lucros e Dividendos: A Companhia e suas controladas reconhecem o imposto de renda sobre lucros e dividendos distribuídos aos acionistas, considerando o regime de caixa.

3) Imposto de Renda sobre Lucros e Dividendos: A Companhia e suas controladas reconhecem o imposto de renda sobre lucros e dividendos distribuídos aos acionistas, considerando o regime de caixa.

4) Imposto de Renda sobre Lucros e Dividendos: A Companhia e suas controladas reconhecem o imposto de renda sobre lucros e dividendos distribuídos aos acionistas, considerando o regime de caixa.

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19) OUTROS ATIVOS: Ativos não classificados em nenhuma outra categoria de ativos, incluindo ativos financeiros, direitos de participação em outras empresas, entre outros.

20) INVESTIMENTOS: Investimentos em ações, títulos, derivativos e outros instrumentos financeiros, realizados com o objetivo de obter ganhos de longo prazo.

21) RECEBÍVEIS: Valores devidos por clientes, fornecedores e outras partes relacionadas, incluindo impostos e contribuições a pagar.

22) PASSIVAS: Obrigações decorrentes de operações de crédito, empréstimos, financiamentos e outros instrumentos financeiros, incluindo impostos e contribuições a receber.

23) PATRIMÔNIO LÍQUIDO: Saldo de lucros e reservas acumuladas, incluindo o valor nominal do capital social e o valor adicionado por meio de reservas e resultados.

24) REVALUATION: Ajustes de valor realizados em ativos não circulantes, decorrentes de mudanças de fair value e outros fatores.

25) OUTROS: Outros itens que não se enquadram nas demais categorias, incluindo despesas de natureza financeira e operacional.

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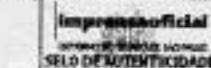
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Telefônica Brasil S.A.

Companhia Aberta  
CNPJ nº 06.958.19/0001-00 - INSC. EST. SP 0750281-4

NOTAS EXPLICATIVAS ÀS DEMONSTRAÇÕES FINANCEIRAS

Período final em 31 de dezembro de 2017 e 2016 (Em milhares de reais, exceto quando mencionado de outra forma)

As notas demonstram faixas de controle e subtotais, exceto para juros à ANATEL, juros e provisões das atividades de telecomunicações, incluídos também, faixas decorrentes de consolidação de regiões.

Table with columns: Descrição, Valor em milhões, 2017, 2016, and Total. It details financial data for 'Voz e dados', 'Serviços de clientes', and 'Outras atividades' for both 2017 and 2016.

Os seguintes créditos são aplicados na avaliação de valor recuperável das seguintes áreas:

- Juros e juros de penalidade por redução do valor recuperável de ações à serem amortizadas na data do encerramento de exercícios antes do quanto as circunstâncias indicadas para permutação de valor contábil;
- Juros e juros de penalidade por redução do valor recuperável de ações à serem amortizadas na data do encerramento de exercícios antes do quanto as circunstâncias indicadas para permutação de valor contábil.

As permutas foram aplicadas no balanço patrimonial da Companhia e em permutas representativas de ativos e passivos com base em projetos de mercado financeiro, documentação e aprovação pela Administração da Companhia.

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Quando um ativo é avaliado em valor líquido de recuperação, a perda é reconhecida e a perda é reconhecida em valor líquido de recuperação. O valor líquido de recuperação é determinado com base em projeções de fluxo de caixa descontadas.

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Telefônica Brasil S.A.

Companhia Aberta  
CNPJ nº 02.506.12/0001-02 - NIRE: 15.230.188/1-4

NOTAS EXPLICATIVAS ÀS DEMONSTRAÇÕES FINANCEIRAS

Exercícios findos em 31 de dezembro de 2018 e 2017 (em milhares de reais, exceto quando mencionado de outra forma)

10. CUSTOS E DESPESAS OPERACIONAIS

Table with columns: 2018, 2017, Custos dos Serviços Prestados e Mercados, Despesas com Despesas Gerais e Administrativas, Total. Rows include Personnel, Services, Insurance, Depreciation, and Total.

Table with columns: 2018, 2017, Custos dos Serviços Prestados e Mercados, Despesas com Despesas Gerais e Administrativas, Total. Rows include Personnel, Services, Insurance, Depreciation, and Total.

1) Inclui os custos e despesas com honorários, salários, vantagens e benefícios sociais, participação nos lucros, planos de remuneração baseados em ações, planos de previdência e outros benefícios planejados.  
2) Inclui os custos e despesas com licenciamento e uso de redes, propaganda e publicidade, manutenção de planta, energia elétrica, segurança, limpeza, compra de conteúdo de TV, agenciamento e intermediários comerciais, provisão para créditos, facultativos, legítimos e sempre segun, conteúdo e produção de cursos, aplicativos, serviços financeiros, entre outros.

3) Inclui os custos e despesas com aquisição de infraestrutura, mobiliário, equipamentos, veículos, seguros e outros de consumo.

4) Inclui os custos e despesas com aquisição de bens, materiais, bens para a manutenção de frotas e outros insumos, peças e componentes.

5) Inclui os custos e despesas com depreciação e amortização de ativos e de valores de P&S e ODP/ODI em conformidade com o método de custo de aquisição em 31/12/2017.

Table with columns: 2018, 2017, Custos dos Serviços Prestados e Mercados, Despesas com Despesas Gerais e Administrativas, Total. Rows include Personnel, Services, Insurance, Depreciation, and Total.

1) Para o exercício findo em 31 de dezembro de 2018, incluem os custos de aquisição de ativos intangíveis em 31/12/2017.  
2) Para o exercício findo em 31 de dezembro de 2018, incluem os custos de aquisição de ativos intangíveis em 31/12/2017.  
3) Para o exercício findo em 31 de dezembro de 2018, incluem os custos de aquisição de ativos intangíveis em 31/12/2017.

11. RECEITAS (COMPENSAÇÃO) FINANCIÁRIAS

1) Receitas de juros e variações monetárias e cambiais decorrentes de aplicações financeiras, instrumentos financeiros derivativos, empréstimos, financiamentos, operações, ações de swap presente de transações e ganhos com a venda de instrumentos financeiros e outros operações financeiras, sendo realizadas pelo regime de competência ou pelo regime de caixa.  
2) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.

Table with columns: 2018, 2017, Custos dos Serviços Prestados e Mercados, Despesas com Despesas Gerais e Administrativas, Total. Rows include Personnel, Services, Insurance, Depreciation, and Total.

1) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.  
2) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.  
3) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.

12. TRANSACÇÕES E BALANÇO COM PARTES RELACIONADAS

1) Transações e balanço com partes relacionadas.  
2) O Grupo inclui suas partes relacionadas decorrentes de transações com empresas relacionadas com o grupo financeiro, as quais foram realizadas em condições de mercado e dentro dos limites comerciais acordados em contratos entre as partes, e são como segue:  
a) Serviços de telefonia fixa e móvel, prestados a empresas do Grupo Telefônica.  
b) Serviços de TV digital, prestados pela Mídia Redevisão Ltda. Anatel.  
c) Aluguel, manutenção de equipamento de segurança e serviços de conexão de rede, prestados pela Telefônica Inteligência e Conexão Digital.  
d) Serviços corporativos, relacionados com o uso de equipamentos fornecidos pelas empresas do Grupo Telefônica.  
e) Direito de uso de determinadas tecnologias de software, licenciado e mantido por suporte contratado pela Telefônica Global Technology.  
f) Infraestrutura de telecomunicações internacional para diversos circuitos de dados e serviços de conexão, prestados pela Telefônica Global Brazil, Telefônica Internacional Wireless Services e Telefônica USA, Ltd. (TUSA).  
g) Operações com empresas do Grupo Telefônica, relacionadas à compra de conteúdo de internet, prestação de publicidade e serviços de suporte de audiência.  
h) Serviços de marketing prestados pelas empresas do Grupo Telefônica.  
i) Serviços de conexão e interconexão de rede de comunicações eletrônicas, prestados pela Telefônica de Espanha.  
j) Serviços de comunicação de dados e soluções de internet, prestados pela Telefônica Inteligência Wireless Services e Telefônica USA.  
k) Serviços de operação de longo alcance e de roaming internacional, prestados por empresas do Grupo Telefônica.  
l) Pagamento de despesas e gastos diversos pela Companhia e outras entidades controladas pela empresa do Grupo Telefônica.  
m) Divid. P&S pelo resgate de 100 milhões de ações da Telefônica pagas à Telefônica.  
n) Provisões de despesas de acordo previstas pela Anatel.

Table with columns: 2018, 2017, Custos dos Serviços Prestados e Mercados, Despesas com Despesas Gerais e Administrativas, Total. Rows include Personnel, Services, Insurance, Depreciation, and Total.

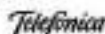
1) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.  
2) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.  
3) Para o exercício findo em 31 de dezembro de 2018, incluem os ganhos com a venda de ativos intangíveis em 31/12/2017.

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Telefônica Brasil S.A.
CNPJ nº 07.058.177/0001-01 - NIRE 35.3.011991-4

NOTAS EXPLICATIVAS ÀS DEMONSTRAÇÕES FINANCEIRAS

Exercício final em 31 de dezembro de 2016 e 2017 (em milhares de reais, exceto quando mencionado de outra forma)

Table with 2 columns: Plano de avaliação de ativos e Plano de benefícios de saúde. Rows include Taxa passiva de desconto, Taxa de crescimento, Taxa de mortalidade, Taxa de rotatividade, Taxa de atividade, and Riscos. Values are provided for 2016 and 2017.

A avaliação dos ativos financeiros segundo a IFRS 9, é gerada baseada no método de redução no valor em uma transação gerada e em suas características de fluxo de caixa contínuas.
Os ativos financeiros avaliados de acordo com a IFRS 9 são avaliados em valor justo e avaliados em valor justo a mercado, exceto quando o método de avaliação de ativos financeiros depende de sua mensuração, que pode ser de acordo com o método de avaliação de ativos financeiros.

Além das premissas apresentadas nas páginas 2016 e 2017 foram adotadas outras premissas comuns a todos os cálculos, como segue: (i) taxa de inflação de longo prazo de 4,2%; e (ii) crescimento anual no valor das ações negociadas em bolsa de 10,0%.
C.3.1) O valor de mercado de ações é determinado com base no preço de fechamento das ações no mercado de valores mobiliários em 31 de dezembro de 2016 e 2017.

O valor contábil de um ativo é reduzido por meio de uma provisão e a razão da perda é reconhecida na demonstração dos resultados de acordo com o método de avaliação de ativos financeiros.
O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.

Table with 2 columns: Plano de previdência e Plano de benefícios de saúde. Rows include Plano de previdência, Plano de benefícios de saúde, and Total. Values are provided for 2016 and 2017.

O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.
O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.

Table with 2 columns: Plano de previdência e Plano de benefícios de saúde. Rows include Plano de previdência, Plano de benefícios de saúde, and Total. Values are provided for 2016 and 2017.

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Table with 2 columns: Plano de previdência e Plano de benefícios de saúde. Rows include Plano de previdência, Plano de benefícios de saúde, and Total. Values are provided for 2016 and 2017.

O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.
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O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.
O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.

Investimentos em títulos variáveis em termos de ganhos, perdas e distribuição, sob o regime de integralização, com o objetivo de distribuição de dividendos, exceto em casos de distribuição de dividendos em espécie, exceto em casos de distribuição de dividendos em espécie.

O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.
O reconhecimento de uma perda é reconhecido no balanço patrimonial e no balanço de resultados de acordo com o método de avaliação de ativos financeiros.



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Módulo de Certificação: 212183A0874C1048811238F278AC193271A
[ Titulo: 20162017 ] - www.imprintaoficial.sp.gov.br



TABELA DE NOTAS - S. PAULO
AUTENTICAÇÃO
AUT1064AY0515616



**Telefônica**  
**Telefônica Brasil S.A.**  
 CNPJ nº 02.028.127/0001-02 - INSC. EST. 020.0001-4

**NOTAS EXPLICATIVAS DAS DEMONSTRAÇÕES FINANCEIRAS**

Exercícios findos em 31 de dezembro de 2018 e 2017 (em milhões de reais, exceto quando especificado em outra forma)

**4) Classificação das ativos e passivos financeiros por categoria e natureza de seu justo valor**

Os valores a seguir representam a composição e classificação dos ativos e passivos financeiros em 31 de dezembro de 2018 e 2017, considerando as pretensões decorrentes da adoção do IFRS em 01 de janeiro de 2018 (nota 2).

Classificação por categoria	Composição financeira de		Valor justo	
	31/12/18	31/12/17	31/12/18	31/12/17
<b>Ativos Financeiros</b>				
<b>Ativo circulante</b>				
Caixa e equivalentes de caixa (nota 2)			1.275.200	3.281.173
Contas a receber (nota 4)			2.248.001	2.240.400
Instrumentos financeiros derivativos (nota 2)			-	2.460
Instrumentos financeiros derivativos (nota 2)			-	2.460
<b>Não Circulante</b>				
Aplicações financeiras em garantia			69.068	61.968
Contas a receber (nota 4)			76.717	81.472
Instrumentos financeiros derivativos (nota 2)			426.252	187.862
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Total de ativos financeiros</b>			<b>13.320.782</b>	<b>11.299.395</b>
<b>Passivos Financeiros</b>				
<b>Passivo circulante</b>				
Comprovação (nota 16)			7.745.132	8.598.044
Comprovação a fornecedores (nota 20)			2.276.272	1.128.122
Comprovação a fornecedores (nota 20)			283.734	304.021
Debitores (nota 20)			90.847	1.418.174
Debitores (nota 20)			41.121	512
Instrumentos financeiros derivativos (nota 2)			15.838	4.372
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Não Circulante</b>				
Comprovação a fornecedores (nota 20)			817.925	1.263.582
Comprovação a fornecedores (nota 20)			341.722	525.421
Comprovação contingente (nota 20)			488.028	448.144
Debitores (nota 20)			3.043.840	3.898.243
Debitores (nota 20)			-	42.910
Instrumentos financeiros derivativos (nota 2)			22.810	11.412
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Total de passivos financeiros</b>			<b>13.680.427</b>	<b>11.829.826</b>

Classificação por categoria	Composição financeira de		Valor justo	
	31/12/18	31/12/17	31/12/18	31/12/17
<b>Ativos Financeiros</b>				
<b>Ativo circulante</b>				
Caixa e equivalentes de caixa (nota 2)			1.361.326	4.056.336
Contas a receber (nota 4)			2.204.262	2.536.446
Instrumentos financeiros derivativos (nota 2)			-	2.460
Instrumentos financeiros derivativos (nota 2)			-	2.460
<b>Não Circulante</b>				
Aplicações financeiras em garantia			70.234	61.466
Contas a receber (nota 4)			426.252	273.866
Instrumentos financeiros derivativos (nota 2)			38.499	60.986
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Total de ativos financeiros</b>			<b>13.804.311</b>	<b>11.929.694</b>
<b>Passivos Financeiros</b>				
<b>Passivo circulante</b>				
Comprovação (nota 16)			7.842.782	7.447.136
Comprovação a fornecedores (nota 20)			1.270.431	1.120.732
Comprovação a fornecedores (nota 20)			283.734	304.021
Debitores (nota 20)			92.849	1.410.174
Debitores (nota 20)			41.121	512
Instrumentos financeiros derivativos (nota 2)			15.818	4.374
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Não Circulante</b>				
Comprovação a fornecedores (nota 20)			817.928	1.263.582
Comprovação a fornecedores (nota 20)			341.722	525.421
Comprovação contingente (nota 20)			488.028	448.144
Debitores (nota 20)			3.043.840	3.898.243
Debitores (nota 20)			-	42.910
Instrumentos financeiros derivativos (nota 2)			22.810	11.412
Instrumentos financeiros derivativos (nota 2)			-	-
<b>Total de passivos financeiros</b>			<b>13.821.801</b>	<b>11.829.826</b>

**5) Reestruturação**  
 O efetivo de gestão do capital da Companhia assegurou que a reestruturação do grupo de empresas tenha gerado as contribuições e uma reação do capital de risco, a fim de apoiar de maneira mais efetiva a Companhia e maximizar o valor da sociedade.  
 A Companhia adotou sua estrutura de capital baseada no modelo de negócios e no modelo econômico atual. Com esse objetivo, a Companhia pode estruturar melhor os resultados, devido ao menor investimento em ativos de longo prazo e a redução de investimentos financeiros derivativos. Até o exercício findo em 31 de dezembro de 2018, não houve mudança nas estruturas, métodos ou processos de estruturação de caixa.  
 A Companhia mudou a estrutura de ativos líquidos de longo prazo de investimentos, derivativos, instrumentos financeiros, comprovação contingente e instrumentos financeiros derivativos, dedicados às atividades de estruturação de caixa, aplicações financeiras em garantia e financiamento de longo prazo gerado decorrente de comprovação contingente.  
 De acordo com o entendimento aplicado, concluiu-se sobre o patrimônio líquido da Companhia não haverem sido efetuados ajustes.

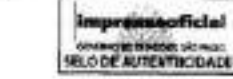
	31/12/18	31/12/17
<b>Caixa e equivalentes de caixa</b>	1.275.200	3.281.173
Depósitos, financiamento, debitores, ativo financeiro, ativo financeiro, comprovação contingente	3.043.840	3.898.243
Instrumentos financeiros derivativos, passivos	55.150	142.734
Aplicações financeiras em garantia e debitores	12.477	11.702
Ativo gerador da comprovação contingente	488.028	448.144
Investimentos líquidos	1.093.891	3.093.891
Passivos financeiros	71.807.002	68.081.562
Saldo de estruturação de caixa	3,7%	5,4%

**6) Fluxo de caixa de caixa**  
 A Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.  
**6.1) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.  
**6.2) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.  
**6.3) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.

Em 31 de dezembro de 2018, 0,8% do ativo financeiro de 2018 e 0,9% do ativo financeiro de 2017, o risco de não ser pago ocorre das devedoras de 1ª Categoria - Ativo Circulante, informado ao IFRS, ao qual não há requerimento de comprovação financeira caso ocorra um movimento adverso em relação ao IFRS. Para reduzir o risco de não ser pago, a Companhia e seus controlados investem e exercem o controle de liquidez de R\$ 175.720 e R\$ 202.228 em 31 de dezembro de 2018 e 2017, respectivamente, principalmente em aplicações financeiras (Certificados de Depósito Bancário de curto prazo baseadas na classificação de CDB) de valores controlados de acordo com o entendimento aplicado em termos de mercado, em razão de serem negociáveis à vista.  
**6.4) Fluxo de caixa de caixa**  
 O risco de liquidez controlado no entendimento da Companhia não dispõe de recursos suficientes para sua operação com os compromissos em longo prazo decorrentes de suas operações e investimentos em ativos de longo prazo.  
 A Companhia estruturou os investimentos dos instrumentos financeiros não derivativos, controlados de liquidez de R\$ 202,228 e de seus respectivos instrumentos financeiros derivativos de longo prazo de acordo com o entendimento aplicado em termos de mercado para cada período.  
 A Companhia estruturou os investimentos dos instrumentos financeiros não derivativos, controlados de liquidez de R\$ 202,228 e de seus respectivos instrumentos financeiros derivativos de longo prazo de acordo com o entendimento aplicado em termos de mercado para cada período.

	Ativo de longo prazo	Ativo de longo prazo	Ativo de longo prazo	Ativo de longo prazo
<b>Ativo de longo prazo</b>	1.275.200	3.281.173	1.361.326	4.056.336
Comprovação contingente	488.028	448.144	488.028	448.144
Instrumentos financeiros derivativos	15.818	4.374	15.818	4.374
<b>Total</b>	<b>1.779.046</b>	<b>3.733.691</b>	<b>1.865.172</b>	<b>4.504.854</b>

**7) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.  
**7.1) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.  
**7.2) Fluxo de caixa de caixa**  
 Há o risco decorrente da possibilidade de a Companhia vir a sofrer um prejuízo por conta de flutuações no preço de mercado que aumentem as despesas decorrentes do seu passivo de comprovação em modo contingente. Em 31 de dezembro de 2018, 1,8% do ativo financeiro está em comprovação em modo contingente (2,7% em 31 de dezembro de 2017). A Companhia controla instrumentos financeiros de longo prazo (Ativo circulante) e instrumentos financeiros de longo prazo (Ativo não circulante) e instrumentos financeiros de longo prazo (Passivo circulante) e instrumentos financeiros de longo prazo (Passivo não circulante).  
 Devido ao risco, a Companhia e seus controlados estão exercendo o mesmo ciclo de negócios, sendo comprovação em sua estrutura financeira semelhante de ativos controlados para financiar suas operações e instrumentos financeiros relacionados ao seu funcionamento.



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 [Título: 28820212] - www.imprensaoficial.com.br

**TABELA DE NOTAS E VALOR AUTENTICAÇÃO**  
 113300  
**AUTENTICAÇÃO**  
 AU1064AY0515814











# TELEFÔNICA BRASIL S.A.

## BALANÇO PATRIMONIAL

C.N.P.J. nº 02.558.157/0001-62

Em 31 de dezembro de 2018

(em milhares de reais)

ATIVO		PASSIVO E PATRIMÔNIO LÍQUIDO	
Caixa e Equivalentes de Caixa	3.275.300		
Estoques	460.800		
Circulante - Outros	14.505.274	Circulante	17.164.957
Não Circulante	7.379.263	Não Circulante	13.662.292
Investimentos, imobilizado e intangível	76.813.639	Patrimônio líquido	71.607.027
<b>Total do ativo</b>	<b>102.434.276</b>	<b>Total do passivo e patrimônio líquido</b>	<b>102.434.276</b>


## ÍNDICES

Liquidez Imediata	0,19	$\frac{\text{Caixa e Equivalentes de Caixa}}{\text{Passivo Circulante}}$
Liquidez Corrente	1,06	$\frac{\text{Ativo Circulante}}{\text{Passivo Circulante}}$
Liquidez Seca	1,04	$\frac{\text{Ativo Circulante} - \text{Estoques}}{\text{Passivo Circulante}}$
Liquidez Geral	0,83	$\frac{\text{Ativo Circulante} + \text{Não Circulante}}{\text{Passivo Circulante} + \text{Não Circulante}}$
Solvência Geral	3,32	$\frac{\text{Ativo Total}}{\text{Passivo Circulante} + \text{Não Circulante}}$
Grau de Endividamento	0,43	$\frac{\text{Passivo Circulante} + \text{Não Circulante}}{\text{Patrimônio Líquido}}$
Participação de Capitais de Terceiros sobre os Recursos Totais	0,30	$\frac{\text{Passivo Circulante} + \text{Não Circulante}}{\text{Ativo Total}}$
Quociente de Origem de Recursos a Longo Prazo	0,84	$\frac{\text{Patrimônio Líquido}}{\text{Patrimônio Líquido} + \text{Passivo não Circulante}}$
Garantia de Capital de Terceiros	2,32	$\frac{\text{Patrimônio Líquido}}{\text{Passivo Circulante} + \text{Não Circulante}}$

Capital Social Integralizado em 31/12/2018: R\$63.571.415.866,09

Patrimônio Líquido em 31/12/2018: R\$71.607.027.631,94

São Paulo, 20 de fevereiro de 2019.

  
 Carlos César Mazur  
 Contador  
 CRC 1PR-026067





# CREA-SP

Conselho Regional de Engenharia, Arquitetura e Agronomia de São Paulo

## CERTIDÃO DE ACERVO TÉCNICO - CAT

Válida somente com a autenticação do CREA-SP

CERTIDÃO Nº: **SZO-77554**



Folha nº: 1 de 1

Referente à(s) ART(s) 92221220070611348

**CERTIFICAMOS**, para os devidos fins, de acordo com os artigos 4º, 5º e 6º da Resolução nº 317/86 do CONFEA, que consta em nossos arquivos o registro de Acervo Técnico do profissional abaixo mencionado:

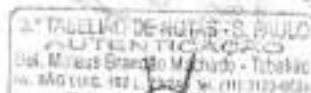
**Profissional** **MARCELO IACABO**  
**Título(s)** Engenheiro Eletricista  
**CREASP Nº** 0685024202  
**Atribuições** Artigos 08 e 09, da Resolução 218/73, do CONFEA.  
**Atividade(s) Técnica(s) Realizada(s)** Responsável Técnico por Execução, Instalação de Equipamento e Manutenção na Área da Engenharia Elétrica - Fomecimento, instalação e manutenção de 1800 computadores desk top e notebooks em regime de locação.  
**Quantificação** Especificadas conforme Atestado anexo.  
**Local da obra/serviço** Rua Sérgio Tomas, n.º 740  
**Cidade** São Paulo **Estado** SP  
**Valor** R\$ 4.442.000,00 (Abril/07)  
**Período** 28/04/07 a 28/06/07  
**Contratante** Legião da Boa Vontade  
**Contratada** Telefônica Empresas S/A  
**CREASP Nº** 0579137

**CERTIFICAMOS**, finalmente, que faz(em) parte integrante da presente Certidão o(s) documento(s) emitido(s) pela contratante ou órgão público, a quem cabe a responsabilidade pela exatidão e veracidade do que nele(s) consta(m).

São Paulo, segunda-feira, 27 de agosto de 2007

Conferido: Sonia Maria Vilhena - GRES - Oeste

Renato Almeida Pinheiro - GRES - Oeste



**IMPORTANTE:** A presente certidão é válida somente como O Acervo Técnico é toda a experiência adquirida ao longo da vida do profissional, compatível com suas atribuições legais, não cabendo qualquer limitação temporal

MARCELO IACABO





LEGIÃO DA BOA VONTADE

Diretor-Presidente:  
 José de Paiva Netto  
 CNPJ: 33.913.604/0001-17  
 Instituição filantrópica,  
 cultural, beneficente e  
 filantrópica, reconhecida  
 como de Utilidade  
 Pública Federal pelo  
 Decreto nº 39.424, de  
 19/6/1950,  
 fundado  
 em 1950, com  
 representação nas Nações  
 Unidas no Departamento  
 de Informação Pública  
 (UPI) e no Conselho  
 Econômico e Social  
 (Ecosoc), com status  
 consultivo geral.  
 São Carlos  
 Rua Sérgio Tomás, 740  
 São Botolph - São Paulo/SP  
 E-mail - CEP 01131-010  
 Tel: (11) 3225-4550  
 www.lbv.org.br



## ATESTADO DE CAPACIDADE TÉCNICA

Declaramos para os devidos fins, que a empresa **TÉLEFÔNICA EMPRESAS S/A**, com Sede à Av. Tamboré, 341 Barueri, Estado de São Paulo, inscrita no CNPJ Nº 04.027.547/0001-31, é responsável pelo fornecimento, instalação e manutenção de computadores desk top e notebooks (Postos de Trabalho) em regime de locação.

Atestamos ainda, quanto a qualidade do prazo convencionados apresentam-se satisfatórios, demonstrando assim que a referida empresa dispõe de capacidade técnica, não existindo nada que a desabone.

Responsável Técnico pelo serviço: **Marcelo Jacabo**

Registro no Crea sob o nº 0685024262

O PRESENTE DOCUMENTO É PARTE INTEGRANTE DA CERTIFICAÇÃO DE ACERVO TÉCNICO EXPEDIDA NESTA DATA PELO CREA - SP SOB Nº 520.7755.4

Nº Contrato: 075/7

São Paulo, 27.08.2007.

Período do Contratual: 36 meses

Data de assinatura do contrato: 28/04/2007  
 Sônia Maria Atheman  
 Agente Administrativo I  
 Seção de Cadastro - Reg. 3009

Período de Execução do Contrato: 60 dias

Quantidade de Postos de Trabalho: 1800

Valor Total do Contrato: R\$ 4.442.000,00

São Paulo, 08 de Agosto de 2007.

*Assinatura:*  
**Akro Eli de Figueiredo**  
 Superintendente Administrativo da LBV  
 Tel.: 3225-4555  
 Fax: 3225-4547

CARTÃO DO 1º TABELÃO DE NOTAS DE CÉDULA 100000 - 100, 0500  
 AUTENTICAÇÃO: Autenticação Presencial obrigatória enviada para cada com o original apresentado. (10/10)  
 S. Paulo, 17 de Agosto 2007

101  
 Alexandre Morgado da Silva Neto  
 ESCRIVENTE AUTORIZADO  
 CUSTA CONTRA: DIVERBA - R\$ 1,70



CARTÃO DO 1º TABELÃO DE NOTAS DE CÉDULA 100000 - 100, 0500  
 Rua das Palmeiras, nº 333 - Santo Cecília - São Paulo / SP - Fone: (11) 3225-4555  
 "VALIDO SOMENTE COM O SELO DE AUTENTICAÇÃO"  
 RECONHEÇO POR SERENIDADE E FIDELIDADE COM VALOR ESCRITO  
 AKRO ELI DE FIGUEIREDO  
 SÃO PAULO, 08 de agosto de 2007.

RECONHEÇO POR SERENIDADE E FIDELIDADE - ESCRITURANTE  
 CUSTAS: R\$ 0,30 22414937 81966151 168736601-06,  
 SP: Michelle ALB: 05215926208750



1067AA236606





SERVIÇO PÚBLICO FEDERAL  
CONSELHO REGIONAL DE ENGENHARIA E AGRONOMIA  
DO ESTADO DE SÃO PAULO - CREA-SP

### **CERTIDÃO DE REGISTRO DE PESSOA JURÍDICA**

**Número da Certidão:** CI - 2084527/2019

**Válida até:** 31/12/2019

**Processo (Sipro):** F-000058/2000

**CERTIFICAMOS**, que a pessoa jurídica abaixo citada se encontra registrada neste Conselho, para atividades técnicas limitadas a competência legal de seus responsáveis técnicos, nos termos da Lei nº 5.194 de 24 de dezembro de 1966.

**CERTIFICAMOS**, ainda, face ao estabelecido no artigo 68 da referida Lei, que a pessoa jurídica mencionada, bem como seus responsáveis técnicos anotados não se encontram em débito com o CREA-SP. **CERTIFICAMOS**, mais, que a certidão não concede a empresa o direito de executar quaisquer serviços técnicos sem a participação real, efetiva e inofismável dos responsáveis técnicos abaixo citados, e que perderá a sua validade se ocorrer qualquer modificação nos dados cadastrais nela contidos, após a data de sua expedição.

**Razão Social:** TELEFÔNICA BRASIL S.A.

**CNPJ:** 02.558.157/0001-62

**Endereço:** Avenida AVENIDA ENGENHEIRO LUIZ CARLOS BERRINI, 1376 32º ANDAR  
CIDADE MONÇÕES  
04571-936 - São Paulo - SP

**Número de registro no CREA-SP:** 0549094

**Data do registro:** 21/01/2000

**Capital Social:** R\$ \*\*\*\*\*63.571.415.865,09 reais

#### **Observação:**

Restricao de Atividades ref. ao obj. social, conf. Instr. vigente.

EXCLUSIVAMENTE PARA AS ATIVIDADES DE ENGENHARIA CIVIL E ENGENHARIA ELÉTRICA DE ACORDO COM O DISPOSTO NAS ATRIBUIÇÕES DOS PROFISSIONAIS ANOTADOS.

#### **Objetivo Social:**

\*Art. 2 - A Sociedade tem por objeto:

- a) a exploração de serviços de telecomunicações;
- b) o desenvolvimento das atividades necessárias ou úteis à execução desses serviços, na conformidade das concessões, autorizações e permissões que lhe forem outorgadas;
- c) A exploração de serviços de valor adicionado, incluindo, disponibilização sem cessão definitiva, de conteúdo de áudio, vídeo, imagem e texto, aplicativos

DA exploração de soluções integradas, gestão e prestação relacionados a: (i) data center, incluindo hospedagem e armazenamento, processamento e gerenciamento de dados textos, imagens, vídeos, aplicativos e sistemas de informações e congêneres; (iii) tecnologia da informação; (iv) segurança da informação e da comunicação; (v) telecomunicações; e (vi) sistemas de segurança eletrônica relacionados a roubo, intrusão, incêndio e outros; e

e) Licenciamento e sub-licenciamento de softwares de qualquer natureza.



**SERVIÇO PÚBLICO FEDERAL  
CONSELHO REGIONAL DE ENGENHARIA E AGRONOMIA  
DO ESTADO DE SÃO PAULO - CREA-SP**

Continuação da Certidão: CI - 2084527/2019 Página 2/4

Parágrafo Único - Na consecução do seu objeto, a Sociedade poderá incorporar ao seu patrimônio bens e direitos de terceiros, bem como:

- I - participar do capita/ de outras empresas, inclusive visando ao cumprimento da política nacional de telecomunicações;
- II - constituir empresas e/ou subsidiárias para a execução de atividades compreendidas no seu objeto e que se recomende sejam descentralizadas;
- III - promover a importação de bens e serviços necessários à execução de atividades compreendidas no seu objeto;
- IV - prestar serviços de assistência técnica às empresas do setor de telecomunicações, executando atividades de interesse comum;
- V - gerir e prestar serviços de manutenção, assistência e suporte técnico em informática e em equipamentos relacionados às atividades da Sociedade;
- VI - prestar serviços de consultoria relacionadas às atividades da Sociedade;
- VII - elaborar, implantar e instalar projetos relacionados às atividades da Sociedade;
- VIII - gerir e prestar serviços de engenharia e executar obras de construção civil e correlatas, necessárias para a execução de projetos relacionados às atividades da Sociedade;
- IX - prestar serviços de monitoramento relacionados às atividades da Sociedade;
- X - prestar serviço de intermediação de negócios em geral; e
- XI  comercializar e locar equipamentos e materiais necessários ou úteis à exploração de suas atividades, incluindo equipamentos de precisão, medição e sensores eletrônicos;
- XII - efetuar atividades de estudos e pesquisas, visando ao desenvolvimento do setor de telecomunicações;
- XIII - celebrar contratos e convênios com outras empresas exploradoras de serviços de telecomunicações ou quaisquer pessoas ou entidades, objetivando assegurar a operação dos serviços, sem prejuízo das atribuições e responsabilidades; e
- XIV - exercer outras atividades afins ou correlatas que lhe forem atribuídas pela Agência Nacional de Telecomunicações  ANA TEL.

**Responsável(is) Técnico(s):**

**Nome:** EDSON GONCALVES TEIXEIRA

**Título(s) e atribuição(ões):**

ENGENHEIRO ELETRICISTA

Dos artigos 8º e 9º da Resolução 218, de 29 de junho de 1973, do CONFEA.

**Origem do Registro:** CREA-SP **Número do Registro (CREASP):** 0682145453

**Registro Nacional:** 2605928756

**Data de Início da Responsabilidade Técnica:** 16/04/2015

**Nome:** MARIO STEFANELLI VIEIRA

**Título(s) e atribuição(ões):**

ENGENHEIRO ELETRICISTA

Dos artigos 8º e 9º da Resolução 218, de 29 de junho de 1973, do CONFEA.

**Origem do Registro:** CREA-SP **Número do Registro (CREASP):** 5060521066



SERVIÇO PÚBLICO FEDERAL  
CONSELHO REGIONAL DE ENGENHARIA E AGRONOMIA  
DO ESTADO DE SÃO PAULO - CREA-SP

Continuação da Certidão: CI - 2084527/2019 - Página 3/4

**Registro Nacional:** 2603569139

**Data de Início da Responsabilidade Técnica:** 16/04/2015

**Nome:** MARCELO IACABO

**Título(s) e atribuição(ões):**

ENGENHEIRO ELETRICISTA

Dos artigos 8º e 9º da Resolução 218, de 29 de junho de 1973, do CONFEA.

**Origem do Registro:** CREA-SP **Número do Registro (CREASP):** 0685024202

**Registro Nacional:** 2603898051

**Data de Início da Responsabilidade Técnica:** 23/10/2015

**Nome:** ANTONIO RENATO SAMPAIO MOREIRA DA COSTA

**Título(s) e atribuição(ões):**

ENGENHEIRO CIVIL

Do artigo 7º da Resolução 218, de 29 de junho de 1973, do CONFEA.

**Origem do Registro:** CREA-SP **Número do Registro (CREASP):** 0601765971

**Registro Nacional:** 2602075655

**Data de Início da Responsabilidade Técnica:** 24/08/2017

\*\*\*\*\*  
**Esta certidão não quita nem invalida qualquer débito ou infração em nome da empresa e/ou profissional(is), e perderá sua validade caso ocorram quaisquer alterações em seus dados acima descritos.**

A falsificação deste documento constitui-se em crime previsto no Código Penal Brasileiro, sujeitando o(a) autor(a) à competente ação penal e/ou processo ético respectivo.

A autenticidade desta certidão deverá ser verificada no site: [www.creasp.org.br](http://www.creasp.org.br)

Código de controle da certidão: d92e53b5-6959-46f0-8123-622289ba9f56.

Situação cadastral extraída em 06/06/2019 17:18:28.

Emitida via Serviços Online.



SERVIÇO PÚBLICO FEDERAL  
CONSELHO REGIONAL DE ENGENHARIA E AGRONOMIA  
DO ESTADO DE SÃO PAULO - CREA-SP

Continuação da Certidão: CI - 2084527/2019 Página 4/4

*Em caso de dúvidas, consulte 0800171811, ou site [www.creasp.org.br](http://www.creasp.org.br), link Atendimento/Fale Conosco, ou ainda através da unidade **UGI SUL**, situada à **Rua: BANDEIRA PAULISTA, 716, EDIFÍCIO WORK HOME - 11º ANDAR - SALA 114, ITAIM BIBI, SÃO PAULO-SP, CEP: 04532-911**, ou procure a unidade de atendimento mais próxima.*

SÃO PAULO, 06 de junho de 2019





## PREFEITURA DO MUNICÍPIO DE RANCHARIA

Rua Marcílio Dias, 719 - Cx. Postal 24 - CEP. 19.600-000 - RANCHARIA - SP  
Fone: (018) 3265.9200 - Fax (18)3265.9204 - CNPJ. 44.935.278/0001-26  
e-mail: [contato@rancharia.sp.gov.br](mailto:contato@rancharia.sp.gov.br) - Site [www.rancharia.sp.gov.br](http://www.rancharia.sp.gov.br)

### ATESTADO DE CAPACIDADE TÉCNICA

Declaramos para os devidos fins, que a TELEFONICA DATA S/A, com Sede à Av: Tamboré, 341 Parte - Alphaville – Barueri, Estado de São Paulo, inscrita no CNPJ Nº 04.027.547/0036-61, vem nos prestando Serviços de locação de VSTI, com suporte técnico e manutenção.

Atestamos ainda, quanto à qualidade e prazo convencionados, os serviços apresentam-se satisfatórios, demonstrando assim que a referida empresa dispõe da capacidade técnica necessária, não existindo nada que a desabone.

Nº do contrato: 0029/17

Período contratual: 12 meses

Data de assinatura do contrato: 10/02/2017

Valor total do contrato: R\$ 286.560,00

Quantidade de equipamentos: 128 máquinas

Rancharia, 25 de maio de 2017.



Nome do representante: Guilherme José Gomes Silva

Cargo: Diretor de T.I.

Endereço: Rua Marcílio Dias, 719 - Centro

Telefone de Contato: (18) 3265-9228



# SECRETARIA DO PLANEJAMENTO E ORÇAMENTO

Praça dos Girassóis, Palmas-TO – CEP 77001-002 | +55 63 3212-4406 | www.seplan.to.gov.br

## ATESTADO DE CAPACIDADE TÉCNICA

Declaramos para os devidos fins, que a empresa TELEFONICA DATA S/A, sediada na Av: Tamboré, 341 Parte - Alphaville – Barueri, Estado de São Paulo, inscrita no CNPJ nº 04.027.547/0036-61, é responsável pelo fornecimento, instalação e manutenção de computadores, Desktops, All in One, Notebooks e Tablets, em regime de locação.

- Número de Contrato e/ou Edital: PREGÃO ELETRÔNICO Nº 009/2017
- Prazo contratual: 30 meses
- Prazo de execução: Em vigência a partir de dez/2017
- Quantidade de computadores conforme a tabela abaixo:

### QUANTITATIVO TOTAL DO REGISTRO DE PREÇOS

Equipamento	Quantidade
Desktop Tipo 1	180
Desktop Tipo 2	425
Notebook Tipo 1	50
Notebook Tipo 2	50
All-in-One	835
Tablet	10

### QUANTITATIVO CONTRATADO PELA SEPLAN

Equipamento	Quantidade
Desktop Tipo 1	35
Desktop Tipo 2	17
Notebook Tipo 1	0
Notebook Tipo 2	9
All-in-One	10
Tablet	0

Atestamos ainda, quanto a qualidade e preços convenionados apresentam-se satisfatórios, demonstrando assim que a referida empresa dispõe de parâmetros técnicos, não existindo, em nossos registros, até a presente data, fatos que desabonem a sua conduta e responsabilidade com as obrigações assumidas.

Palmas, 19 de Junho de 2018;

Nome:  
Cargo:

Telefone de Contato: (63) 98401-3764

*Raimundo Pizem Milhomens*  
Raimundo Pizem Milhomens  
Diretor de Desenvolvimento

**30=3** Cartório do Recreio - 0892740319185  
Av. das Américas 18431 - Recreio dos Búzios - Ilha de Itaipua - CEP: 63010-000 - Fortaleza - CE

**AUTENTICAÇÃO**  
Certifico e dou fé que o PREGÃO ELETRÔNICO nº 009/2017, de 19/06/2017, foi realizado em 13 de setembro de 2017. Conf. por: EDER82718-AQG Consulte em <https://www3.tirj.tu.br/itep/bloco>

Encarregado: Rj Cesar Silva da Costa - Escritório J. Fundos R\$ 2,00  
Tome 047 7 41

Cartório Sira da Costa e Ofício de Notas  
Matr. 94.10042



**ABC**  
Telecom

**Soluções Inteligentes**  
dados, voz e internet

**Atestado de Capacidade Técnica**

Declaramos para os devidos fins, que a Empresa A. Telecom S/A , com sede à Alameda Campinas, 1070 – 1º. Andar – São Paulo/SP, inscrita no CNPJ No. 03.498.897/0001-13 é responsável pelo fornecimento de computadores (Desktops) em regime de Locação e Acesso à Internet banda Dedicada.

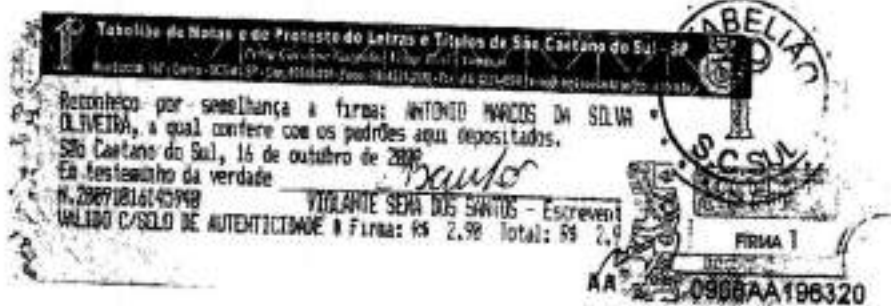
Atestamos ainda, que a qualidade e o prazo convencionados apresentam-se satisfatórios, demonstrando assim, que a referida empresa dispõe da Capacidade Técnica, não existindo nada que desabone.

No. Do Contrato: 099/2008  
Período Contratual: 36 meses  
Data da Assinatura do Contrato: 18/03/2008  
Quantidade de Computadores: 620  
Valor Total do Contrato: R\$ 1.792.320,00

São Caetano do Sul, 16 de Outubro de 2009.



Antonio Marcos da Silva Oliveira  
Socio-Diretor  
RG.: 16.850.944-9



**ABC Net Telecomunicações e Tecnologia Ltda.**  
Rua Santa Catarina, 77 - 2o. Andar - Centro  
Cep. 09510-120 - São Caetano do Sul - SP  
Fone. 0800 - 019 8666 - e-mail: comercial@netabc.com.br  
CNPJ.: 01.497.808/0001-99 I.E.: 636.149.116.118  
www.netabc.com.br



## ATESTADO DE CAPACIDADE TÉCNICA

### Emitente

**INBRANDS S/A**, inscrita no CNPJ sob o nº **09.054.385/0001-44**, com sede na Rua Cel Luis Barroso, Estado de São Paulo doravante individualmente denominada "INBRANDS S/A".

### Prestadora

**TELEFONICA S/A**, inscrita no CNPJ/MF sob o nº. **02.558.157/0001-62** com sede na Av. Eng. Luiz Carlos Berrine, 1376, Cidade Monções, CEP 04571-936, no município de São Paulo, Estado de São Paulo e suas respectivas filiais, doravante individualmente denominada "TELEFONICA S/A".

1. Para devidos fins, confirmamos o fornecimento de Licenças Office 365 descritas abaixo, na modalidade CSP, obedecendo os prazos de entrega previstos em contrato. Os serviços estão sendo prestados a contento, conforme descritivo da tabela abaixo:

DESCRIÇÃO	QTD	PERIODO
Licença Office 365 Enterprise E1	134	Mensal-livre
Licença Exchange Online Kiosk	17	Mensal-livre
Licença Office 365 Business Premium	300	Mensal-livre
Licença Office 365 Enterprise E3	660	Mensal-livre
Licença Office 365 F1	420	Mensal-livre

Reconhecemos que os produtos foram entregues com qualidade, profissionalismo, dentro dos prazos requeridos e cronogramas pactuados, não constando, portanto, em nossos arquivos, nada que os desabone.

São Paulo, 01 de Agosto de 2019

Nome : Milton Pereira dos Santos Junior  
Cargo: Coordenador de Infraestrutura e Telecom  
E-mail milton.santos@inbrands.com.br  
Telefone: 11 994703871

INBRANDS Comércio e Confecções de Roupas S.A  
Rua Coronel Luis Barroso, 151 – Santo Amaro - São Paulo - SP





Prefeitura Municipal de Ribeirão Preto – SP  
Secretaria Municipal da Fazenda  
[www.ribeiraopreto.sp.gov.br](http://www.ribeiraopreto.sp.gov.br)

Rua. Lafaiete, 1000 – Cep 14015-080 – Tel (16) 3977-5700



### ATESTADO DE CAPACIDADE TÉCNICA

Atestamos para os devidos fins, que a **Telefônica Data S.A.**, inscrita no CNPJ/MF sob o nº 04.027.547/0036-61, forneceu à **Prefeitura Municipal de Ribeirão Preto**, possuidora do CNPJ/MF nº 56.024.581/0001-56, estabelecida à Praça Barão do Rio Branco, SN, Centro, Ribeirão Preto – SP, conforme **Processo de Compras 0396/16, Pregão Presencial nº 0128/16**, os seguintes serviços: Venda de 850 (oitocentos e cinquenta) Microcomputadores do tipo desktop, no período de janeiro a dezembro de 2016.

Registramos, ainda, que a empresa cumpriu fielmente com suas obrigações, nada constando que a desabone técnica e comercialmente, até a presente data.

Ribeirão Preto, 10 de abril de 2017

Marli Pacube Silva  
Chefe da Divisão Gerenciamento de Pessoal  
(Aferidora do Contrato)  
CPF 099.056.098-81




## **ATESTADO DE CAPACIDADE TÉCNICA**

Declaramos para os devidos fins, que a empresa Telefônica Data S.A com sede à Av. Tamboré 341 - Barueri, Estado de São Paulo, inscrita no CNPJ: 04.027.547/0036-61, é responsável pelo fornecimento, instalação, e manutenção de computadores desktop e/ou notebooks (Postos de Trabalho) em regime de locação.

- Número do Contrato e/ou Edital: Temos vários contratos desde 2008
- Período Contratual: 36 meses
- Período de execução: Temos vários contratos desde 2008
- Quantidade de Posto de Trabalho: 2.128 desktops e 12 notebooks
- Valor Total do Contrato: Confidencial

Atestamos ainda, quanto a qualidade e prazo convencionados apresentam-se satisfatórios, demonstrando assim que a referida empresa dispõe de parâmetros técnicos, não existindo, em nossos registros, até a presente data, fatos que desabonem sua conduta e responsabilidade com as obrigações assumidas.

São Paulo, 28 de abril de 2014.

  
Roberto Noda  
Cargo - Diretoria de Infraestrutura  
Telefone - 11-3348-2300



DEFENSORIA PÚBLICA DO ESTADO DO RIO DE JANEIRO, DPRJ

EDITAL DE PREGÃO ELETRÔNICO DPRJ nº 023/19,

**ANEXO III**

**DECLARAÇÃO EM ATENDIMENTO AO ART. 7º, XXXIII DA CF/88**

**DECLARAÇÃO**

**DECLARO**, sob as **MODELO DE** penas da Lei, em atendimento ao Edital do Pregão Eletrônico nº 023/2019, na Av. Marechal Câmara, 314 – 3º andar – Centro, Rio de Janeiro – RJ, que a empresa TELEFONICA BRASIL S/A – CNPJ nº 02.558.157/0001-62, com sede Av. Engenheiro Luiz Carlos, 1.376 – Cidade Monções – Estado de São Paulo, por mim representada, não possui em seu quadro funcional nenhum menor de 18 ( dezoito ) anos desempenhando trabalho noturno, perigoso ou insalubre ou qualquer trabalho por menor de 16 ( dezesseis ) anos, em obediência ao art. 7º, inciso XXXIII, da Constituição Federal.

Ressalva: (x) que possui menores de 14 (catorze) anos em seu quadro funcional na categoria de aprendiz.

São Paulo, 10 de setembro de 2019

Maria Clara Poio O Bressan

Maria Clara Poio O Bressan

CPF: nº 032.954.408-08

RG: nº 11.091.093-X

DEFENSORIA PÚBLICA DO ESTADO DO RIO DE JANEIRO, DPRJ

EDITAL DE PREGÃO ELETRÔNICO DPRJ nº 023/19

**ANEXO VI**

**DECLARAÇÃO EM ATENDIMENTO AO DECRETO ESTADUAL  
Nº 33.925/2003**

**DECLARAÇÃO**

**DECLARO**, sob as penas da Lei, em atendimento ao Edital do Pregão Eletrônico nº 006/2019, na Av. Marechal Câmara, 314 – 3º andar – Centro, Rio de Janeiro – RJ, TELEFONICA BRASIL S/A – CNPJ nº 02.558.157/0001-62, com sede Av. Engenheiro Luiz Carlos, 1.376 – Cidade Monções – Estado de São Paulo, por mim representada, atende ao disposto no Decreto Estadual nº 33.925/2003, apresentando um efetivo de 33.622 empregados

São Paulo, 10 de setembro de 2019

*Maria Clara Poio Bressan*

Maria Clara Poio O Bressan

CPF: nº 032.954.408-08

RG: nº 11.091.093-X



DEFENSORIA PÚBLICA DO ESTADO DO RIO DE JANEIRO, DPRJ

EDITAL DE PREGÃO ELETRÔNICO DPRJ nº 023/19

ANEXO VI

**DECLARAÇÃO DE ELABORAÇÃO INDEPENDENTE DE PROPOSTA  
E-20/001.001717/2019**

Eu, Maria Clara Poio Oliveira Bressan, como representante devidamente constituído da TELEFONICA BRASIL S/A, doravante denominado LICITANDO, para fins do disposto no item 8.3 do Edital nº 023/19, declara, sob as penas da lei, em especial o art. 299 do Código Penal Brasileiro, que:

- a) A proposta anexa foi elaborada de maneira independente, e que o conteúdo da proposta anexa não foi, no todo ou em parte, direta ou indiretamente, informado a, discutido com ou recebido de qualquer outro participante potencial ou de fato do **E-20/001.001717/2019**, por qualquer meio ou por qualquer pessoa;
- b) A intenção de apresentar a proposta anexa não foi informada a, discutida com ou recebida de qualquer outro participante potencial ou de fato do **E- 0/001.001717/2019**, por qualquer meio ou qualquer pessoa;
- c) Que não tentou, por qualquer meio ou por qualquer pessoa, influir na decisão de qualquer outro participante potencial ou de fato do **E-20/001.001717/2019**, quanto a participar ou não da referida licitação;
- d) Que o conteúdo da proposta anexa não será, no todo ou em parte, direta ou indiretamente, comunicado ou discutido com qualquer outro participante potencial ou de fato do **E-20/001.001717/2019** antes da adjudicação do objeto da referida licitação;
- e) Que o conteúdo da proposta anexa não foi no todo ou em parte, direta ou indiretamente, informado a, discutido com ou recebido de **E-20/001.001717/2019** antes da abertura oficial das propostas e;
- f) Que está plenamente ciente do teor e da extensão desta declaração e que detém plenos poderes e informações para firmá-la.

São Paulo, 10 de setembro de 2019



Maria Clara Poio O Bressan

CPF: nº 032.954.408-08

RG: nº 11.091.093-X

DEFENSORIA PÚBLICA DO ESTADO DO RIO DE JANEIRO, DPRJ

ANEXO VIII

DECLARAÇÃO DE INEXISTÊNCIA DE PENALIDADE

São Paulo, 10 de setembro de 2019

À

Comissão de Pregão

a/c Sr.

Pregoeiro (a)

Referente ao Pregão Eletrônico DPRJ nº 023/19,

A TELEFONICA BRASIL S/A – inscrita no CNPJ nº 02.558.157/0001-62, com sede Av. Engenheiro Luiz Carlos, 1.376 – Cidade Monções – Estado de São Paulo inscrita, neste ato representada pelo sua representante legal, a Sra Maria Clara Poio O Bressan, inscrita no CPF sob o nº 032.954.408-08, portadora da cédula de identidade nº 11.091.093-X, expedida por SSP/SP DECLARA, sob as penas da Lei, que não foram aplicadas penalidades de suspensão temporária da participação em licitação, impedimento de contratar ou declaração de inidoneidade para licitar e contratar por qualquer Ente ou Entidade da Administração Federal, Estadual, Distrital e Municipal cujos efeitos ainda vigorem.

São Paulo, 10 de setembro de 2019



Maria Clara Poio O Bressan

CPF: nº 032.954.408-08

RG: nº 11.091.093-X