Latitude 5540

Owner's Manual

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Right

1. microSD-card slot

   Reads from and writes to the microSD-card.

2. Universal audio jack

   Connect headphones or a headset (headphone and microphone combo).

3. USB 3.2 Gen 1 port

   Connect devices such as external storage devices and printers. Provides data transfer speeds up to 5 Gbps.

4. USB 3.2 Gen 1 port with PowerShare

   Connect devices such as external storage devices and printers.

   Provides data transfer speeds up to 5 Gbps. PowerShare enables you to charge your USB devices even when your co
   is turned off.

   > NOTE: If the charge on your computer's battery is less than 10 percent, you must connect the power adapter to (
   > your computer, and USB devices connected to the PowerShare port.

   > NOTE: If a USB device is connected to the PowerShare port before the computer is turned off or in hibernate sta
   > you must disconnect and connect it again to enable charging.

   > NOTE: Certain USB devices may not charge when the computer is turned off or in sleep state. In such cases, tu
   > the computer to charge the device.

5. HDMI 2.0 port

   Connect to a TV, external display or another HDMI-in enabled device. Provides video and audio output.

6. Network port

   Connect an Ethernet (RJ-45) cable from a router or a broadband modem for network or Internet access, with a transfer
   of 10/100/1000 Mbps.

7. Security-cable slot (wedge-shaped)

   Connect a security cable to prevent unauthorized movement of your computer.

Left

1. Thunderbolt 4.0 port with Power Delivery and DisplayPort

   Supports USB4, DisplayPort 1.4, Thunderbolt 4 and also enables you to connect to an external display using a displa
   Provides data transfer rates of up to 40 Gbps for USB4 and Thunderbolt 4.

   > NOTE: You can connect a Dell Docking Station to the Thunderbolt 4 ports. For more information, search in the
   > Knowledge Base Resource at www.dell.com/support.

   > NOTE: A USB Type-C to DisplayPort adapter (sold separately) is required to connect a DisplayPort device.

   > NOTE: USB4 is backward compatible with USB 3.2, USB 2.0, and Thunderbolt 3.

   > NOTE: Thunderbolt 4 supports two 4K displays or one 8K display.

2. Thunderbolt 4.0 port with Power Delivery and DisplayPort

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   > NOTE: A USB Type-C to DisplayPort adapter (sold separately) is required to connect a DisplayPort device.

   > NOTE: USB4 is backward compatible with USB 3.2, USB 2.0, and Thunderbolt 3.

   > NOTE: Thunderbolt 4 supports two 4K displays or one 8K display.

3. Battery-status light

   Indicates the battery-charge status.

   Solid yellow—Battery charge is low.

   Blinking yellow—Battery charge is critical.

4. Smart-card reader slot (optional)

Top

1. Power button with optional fingerprint reader

    Press to turn on the computer if it is turned off, in sleep state, or in hibernate state.

    When the computer is turned on, press the power button to put the computer into sleep state; press and hold the pow
    button for 10 seconds to force shut-down the computer.

    If the power button has a fingerprint reader, place your finger on the power button steadily to log in.

    NOTE: The power-status light on the power button is available only on computers without the fingerprint
    Computers that are shipped with the fingerprint reader that is integrated on the power button will not have the
    power-status light on the power button.

    NOTE: You can customize the power-button behavior in Windows.

2. Keyboard
3. Fingerprint reader (optional)

    Press your finger on the fingerprint reader to log in to your computer. The fingerprint reader enables your computer to
    recognize your fingerprints as a password.

    NOTE: Configure the fingerprint reader to register your fingerprint and enable access.

4. NFC/Contactless smart card reader (optional)
5. Touchpad

    Move your finger on the touchpad to move the mouse pointer. Tap to left-click and two fingers tap to right-click.

Front

1. Left microphone

   Provides digital sound input for audio recording and voice calls.

2. Infrared emitter (optional)

   Emits infrared light, which enables the infrared camera to sense and track motion.

3. Infrared camera (optional)

   Enhances security when paired with Windows Hello face authentication.

4. Camera shutter

   Slide the privacy shutter to the left to access the camera lens.

5. Camera

   Enables you to video chat, capture photos, and record videos.

6. Camera-status light

   Turns on when the camera is in use.

7. Ambient-light sensor

   The sensor detects the ambient light and automatically adjusts the display brightness.

8. Right microphone

Back

1. Nano-SIM card slot (optional)

Insert a nano-SIM card to connect to a mobile broadband network.

> NOTE: Availability of the nano-SIM card slot depends on the region and configuration ordered.

Bottom

1. Speakers

Provide audio output.

2. Service Tag label

Service Tag

The service tag is a unique alphanumeric identifier that allows Dell service technicians to identify the hardware components in your computer and access warranty information.

Battery charge and status light

The following table lists the battery charge and status light behavior of your Latitude 5540.

Table 1. Battery charge and status light behavior

Power Source	LED Behavior	System Power State	Battery
AC Adapter	Off	S0 - S5	Fully Cl
AC Adapter	Solid White	S0 - S5	< Fully (
Battery	Off	S0 - S5	11-100%
Battery	Solid Amber (590+/-3 nm)	S0 - S5	< 10%

- S0 (ON) - System is turned on.
- S4 (Hibernate) - The system consumes the least power compared to all other sleep states. The system is almost at an (state, expect for a trickle power. The context data is written to hard drive.
- S5 (OFF) - The system is in a shutdown state.

About this task

> NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Steps

1. Connect the power adapter and press the power button.

> NOTE: To conserve battery power, the battery might enter power saving mode. Connect the power adapter and p
> the power button to turn on the computer.

2. Finish operating system setup.

For Ubuntu:

Follow the on-screen instructions to complete the setup. For more information about installing and configuring Ubuntu,
search in the Knowledge Base Resource at www.dell.com/support.

For Windows:

Follow the on-screen instructions to complete the setup. When setting up, Dell recommends that you:
- Connect to a network for Windows updates.
  > NOTE: If connecting to a secured wireless network, enter the password for the wireless network access whe
  > prompted.
- If connected to the internet, sign-in with or create a Microsoft account. If not connected to the internet, create an
  offline account.
- On the Support and Protection screen, enter your contact details.

3. Locate and use Dell apps from the Windows Start menu—Recommended.

Resources	Description
	Dell Product Registration Register your computer with Dell.
	Dell Help & Support Access help and support for your computer.
	SupportAssist SupportAssist is the smart technology that keeps your computer running at its best by opt settings, detecting issues, removing viruses and notifies when you need to make system updates. SupportAssist proactively checks the health of your system's hardware an When an issue is detected, the necessary system state information is sent to Dell to begin troubleshooting. SupportAssist is preinstalled on most of the Dell devices running W operating system. For more information, see SupportAssist for Home PCs User's Guide o www.dell.com/serviceabilitytools. NOTE: In SupportAssist, click the warranty expiry date to renew or upgrade yo
	Dell Update Updates your computer with critical fixes and latest device drivers as they become availa more information on using Dell Update, search in the Knowledge Base Resource at support.
	Dell Digital Delivery Download software applications, which are purchased but not preinstalled on your c For more information on using Dell Digital Delivery, search in the Knowledge Base Resou www.dell.com/support.

Dimensions and weight

The following table lists the height, width, depth, and weight of your Latitude 5540.

Table 3. Dimensions and weight

Description	Values
Height:	
Front height	20.80 mm (0.82 in.)
Rear height	22.80 mm (0.90 in.)
Width	357.80 mm (14.09 in.)
Depth	233.30 mm (9.19 in.)
Weight NOTE: The weight of your computer depends on the configuration ordered and manufacturing variability.	1.613 kg (3.56 lb)

Processor

The following table lists the details of the processors supported by your Latitude 5540.

Table 4. Processor

Description	Option one	Option two	Option three	Option four	Option five	Option six	Op... s...
Processor type	13th Generation Intel Core i3-1315U	13th Generation Intel Core i5-1335U	13th Generation Intel Core i5-1345U vPro	13th Generation Intel Core i5-1340P	13th Generation Intel Core i5-1350P vPro	13th Generation Intel Core i7-1355U	1... G... Ir... i7... v...
Processor wattage	15 W	15 W	15 W	28 W	28 W	15 W	1...
Processor total core count	6	10	10	12	12	10	1...
Performance-cores	2	2	2	4	4	2	2
Efficient-cores	4	8	8	8	8	8	8...
Processor total thread counts	8	12	12	16	16	12	1...

NOTE: Intel® Hyper-Threading Technology is only available on Performance-cores.

Description	Option one	Option two	Option three	Option four	Option five	Option six	Op...
Processor speed	Up to 4.50 GHz	Up to 4.60 GHz	Up to 4.70 GHz	Up to 4.60 GHz	Up to 4.70 GHz	Up to 5 GHz	U... G...
Performance-cores frequency							
Processor base frequency	1.20 GHz	1.30 GHz	1.60 GHz	1.90 GHz	1.90 GHz	1.70 GHz	1...
Maximum turbo frequency	4.50 GHz	4.60 GHz	4.70 GHz	4.60 GHz	4.70 GHz	5 GHz	5...
Efficient-cores frequency							
Processor base frequency	0.90 GHz	0.90 GHz	1.20 GHz	1.40 GHz	1.40 GHz	1.20 GHz	1...
Maximum turbo frequency	3.30 GHz	3.40 GHz	3.50 GHz	3.40 GHz	3.50 GHz	3.70 GHz	3...
Processor cache	10 MB	12 MB	12 MB	12 MB	12 MB	12 MB	1...
Integrated graphics	Intel UHD Graphics	Intel Iris X [e] Graphics	Intel Iris X [e] Graphics	Intel Iris X [e] Graphics	Intel Iris X [e] Graphics	Intel Iris X [e] Graphics	Ir... G...

Chipset

The following table lists the details of the chipset supported by your Latitude 5540.

Table 5. Chipset

Description	Values
Chipset	Integrated in the processor
Processor	13th Generation Intel Core i3/i5/i7
DRAM bus width	64-bit
Flash EPROM	32 MB for non-vPro, 32 MB + 16 MB for vPro/
PCIe bus	Up to Gen 4

Operating system

Your Latitude 5540 supports the following operating systems:

● Windows 11 Home, 64-bit
● Windows 11 Pro, 64-bit
● Windows 11 Pro downgrade (Win 10 Pro image FI + Win 11 Pro DPK)
● Ubuntu 22.04 LTS, 64-bit

Memory

The following table lists the memory specifications of your Latitude 5540.

Table 6. Memory specifications

Description	Values
Memory slots	Two-SODIMM slots
Memory type	● Single-channel DDR4 ● Dual-channel DDR4 ● Single-channel DDR5 ● Dual-channel DDR5
Memory speed	● 3200 MT/s ● 4800 MT/s ● 5200 MT/s
Maximum memory configuration	64 GB
Minimum memory configuration	8 GB

Table 6. Memory specifications (continued)

Description	Values
	● 8 GB, 1 x 8 GB, DDR5, 4800 MT/s, single-c ● 16 GB, 2 x 8 GB, DDR5, 4800 MT/s, dual-c ● 16 GB, 1 x 16 GB, DDR5, 4800 MT/s, single ● 32 GB, 2 x 16 GB, DDR5, 4800 MT/s, dual- ● 64 GB, 2 x 32 GB, DDR5, 4800 MT/s, dual- ● 8 GB, 1 x 8 GB, DDR5, 5200 MT/s, single-c ● 16 GB, 2 x 8 GB, DDR5, 5200 MT/s, dual-c ● 16 GB, 1 x 16 GB, DDR5, 5200 MT/s, single ● 32 GB, 2 x 16 GB, DDR5, 5200 MT/s, dual- ● 64 GB, 2 x 32 GB, DDR5, 5200 MT/s, dual-

External ports

The following table lists the external ports of your Latitude 5540.

Table 7. External ports

Description	Values
Network port	One RJ-45 port

USB ports	● Two Thunderbolt 4 port Power Delivery a
	    NOTE: You can connect a Dell Doc
	    port. For more information, search in
	    Base Resource at www.dell.com/s
	● One USB 3.2 Gen 1 port with PowerShare
	● One USB 3.2 Gen 1 port

Audio port	One Universal audio jack
Video port	One HDMI 2.0 port
Media-card reader	One microSD-card slot
Power-adapter port	USB Type-C power input
Security-cable slot	One security-cable slot (wedge-shaped)

Internal slots

The following table lists the internal slots of your Latitude 5540.

Table 8. Internal slots

Description	Values

Ethernet

The following table lists the wired Ethernet Local Area Network (LAN) specifications of your Latitude 5540.

Table 9. Ethernet specifications

Description	Values
Model number	Intel I219-V/Intel I219-LM
Transfer rate	10/100/1000 Mbps

Wireless module

The following table lists the Wireless Local Area Network (WLAN) modules that are supported on your Latitude 5540.

Table 10. Wireless module specifications

Description	Option one	Option two
Model number	Realtek RTL8852BE	Intel AX211
Transfer rate	Up to 1201 Mbps	Up to 2400 Mbps
Frequency bands supported	2.4 GHz/5 GHz	2.4 GHz/5 GHz/6 GH
Wireless standards	● WiFi 802.11a/b/g ● Wi-Fi 4 (WiFi 802.11n) ● Wi-Fi 5 (WiFi 802.11ac) ● Wi-Fi 6 (WiFi 802.11ax)	● WiFi 802.11a/b/g ● Wi-Fi 4 (WiFi 802. ● Wi-Fi 5 (WiFi 802. ● Wi-Fi 6E (WiFi 802 　NOTE: 　Wi-Fi 6 is sup 　where Wi-Fi 6
Encryption	● 64-bit/128-bit WEP ● AES-CCMP ● TKIP	● 64-bit/128-bit WE ● AES-CCMP ● TKIP
Bluetooth wireless card	Bluetooth 5.3	Bluetooth 5.3

NOTE: The version of the Bluetooth wireless card may vary depe operating system that is installed on your computer.

WWAN module

The following table lists the Wireless Wide Area Network (WWAN) module supported on your Latitude 5540.

Table 11. WWAN module specifications

Table 11. WWAN module specifications (continued)

Description	Option one	Option two
Network standard	LTE FDD/TDD, WCDMA/HSPA+,GPS/ GLONASS/BDS/Galileo	NR FR1(Sub6) FDD/T TDD, WCDMA/HSP/ Galileo/BDS/QZSS

Transfer data rate	● Up to 1 Gbps DL (CAT16)
	● Up 150 Mbps UL
		● SA: DL 4.67 Gbps/U
		● NSA: DL 3.74 Gbp
		● LTE: DL 1.6 Gbps (
		  Mbps
		● UMTS: DL 384 kbp
		  DL DC-HSPA+: 4
		  11.5 Mbps (CAT7

Operating frequency bands	● LTE(B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B34, B38, B39, B40, B41(HPUE), B42, B43, B46(receiver only), B48, B66, B71 ● WCDMA/HSPA+(1, 2, 4, 5, 8)	● NR(n1, n2, n3, n5, n n28, n30, n38, n4 n77, n78, n79) ● LTE (B1, B2, B3, B4 B13, B14, B17, B18 B26, B28, B29, B3 B39, B40, B41, B4 B66, B71*) ● WCDMA/HSPA+ (
Power supply	DC 3.135 V to 4.40 V, typical 3.30 V	DC 3.135 V to 4.4 V, Ty
SIM card	Supported through external SIM slot	Supported through e
eSIM with dual SIM (DSSA)	Supported (the availability of eSIM functionality embedded on the module is dependent on the region and specific carrier requirements)	Supported
Antenna diversity	Supported	Supported
Radio On/Off	Supported	Supported
Wake on wireless	Supported	Supported
Temperature	● Normal operating temperature: -10°C to + 55°C ● Extended Operating temperature: -20°C to +65°C	● Normal operating t to + 55°C ● Extended Operat -30°C to +75°C ● Storage tempera +85°C
Antenna connector	● WWAN Main Antenna x 4 ● Supports 4x4 MIMO	● WWAN Main Anter ● Supports 4x4 MII

NOTE: For instructions on how to find your computer's IMEI (International Mobile Equipment Identity) numb the Knowledge Base Resource at www.dell.com/support.

Audio

The following table lists the audio specifications of your Latitude 5540.

Description	Values
Audio controller	Realtek Waves, MaxxAudio 12.0
Stereo conversion	Supported
Internal audio interface	High definition audio interface
External audio interface	Universal Audio Jack/HDMI 2.0 port
Number of speakers	2
Internal-speaker amplifier	Not supported
External volume controls	Keyboard shortcut controls
Speaker output:	
Average speaker output	2 W
Peak speaker output	2 W
Subwoofer output	Not supported
Microphone	Digital-array microphones in camera asser

Storage

This section lists the storage options on your Latitude 5540.

Your Latitude 5540 supports one of the following options
● One M.2 2230/2280 solid-state drive or optional dual storage

> NOTE: SSD Slot 1 on the system board supports M.2 2230 or M.2 2280 solid-state drives.

> NOTE: SSD Slot 2 on the system board only supports M.2 2230 solid-state drives.

● One M.2 2230 self-encrypting drive

Storage type	Interface type	Capacity
M.2 2230 solid-state drive	PCIe Gen4 x4 NVMe, up to 64 Gbps	Up to 2 TB
M.2 2280 solid-state drive	PCIe Gen4 x4 NVMe, up to 64 Gbps	Up to 1 TB

Media-card reader

The following table lists the media-card reader specifications of your Latitude 5540.

Table 14. Media-card reader (standard offering)

Media supported (Maximum capacity supported will vary by Flash Media Types)	
Media Supported	Micro Secure Digital (mSD)
	Micro Secure Digital High Capacity (mSDH
	Micro Secure Digital Extended Capacity (m
Support Specification Versions	microSD 4.0 card

Keyboard

The following table lists the keyboard specifications of your Latitude 5540.

Table 15. Keyboard specifications

Description	Values
Keyboard type	● Standard backlit keyboard
	● Standard non-backlit keyboard
Keyboard layout	QWERTY
Number of keys	● English US, English International, Arabic (MUI), Chinese traditional, French-Car Hebrew, Korean, Russian, Thai, Ukrainian
	● French-Canadian Quebec, Brazilian, Bel Czech & Slovakian (MUI), Danish, English French European, German, Hungarian, It (MUI), Norwegian, Portugese Iberian, S (Castillian), Spanish (Latin America), S Swiss European (MUI), Turkish, Turkish F
	● Japanese: 103 keys
Keyboard size	X= 18.05 mm key pitch
	Y= 18.05 mm key pitch
Keyboard shortcuts	Some keys on your keyboard have two symbo These keys can be used to type alternate cha perform secondary functions. To type the a press Shift and the desired key. To perform se functions, press Fn and the desired key.
	NOTE: You can define the primary beha function keys (F1–F12) by changing F Behavior in the BIOS setup program.

NOTE: Keyboard characters may differ depending on the keyboard language configuration. Keys that are used for remain the same, regardless of the keyboard language.

NOTE: You can define the primary behavior of function keys in the Function Key Behavior menu of the BIOS setup program.

Table 16. Secondary tasks of keyboard keys

Key combination for task	What the task does
fn and F1	Operating system and application specific F1
fn and F2	Operating system and application specific
fn and F3	Operating system and application specific
fn and F4	Operating system and application specific
fn and F5	Operating system and application specific
fn and F6	Operating system and application specific
fn and F8	Operating system and application specific
fn and F9	Operating system and application specific
fn and F10	Operating system and application specific F10
fn and F11	Operating system and application specific F11
fn and F12	Operating system and application specific F12
fn and Right Ctrl	Open application menu
fn and Cursor up	Page up
fn and Cursor down	Page down

Keys with alternate characters

There are other keys on your keyboard with alternate characters. The symbols that are shown at the bottom of these keys are the main characters that are displayed when the key is pressed; the symbols that are shown at the top of these keys a displayed when the key is pressed with the shift key. For example, if you press 2, 2 is displayed; if you press Shift and 2, (displayed.

Camera

The following table lists the camera specifications of your Latitude 5540.

Table 17. Camera specifications

Description	Values
Number of cameras	One
Camera type	● FHD RGB camera ● FHD RGB + IR camera ● FHD RGB + IR camera with Ambient Light

Table 17. Camera specifications (continued)

Description	Values
Still image	2.07 megapixel
Video	1920 x 1080 (FHD) at 30 fps
Infrared camera resolution:	
Still image	0.23 megapixels
Video	640 x 360 at 30 fps
Diagonal viewing angle:	
Camera	80 degrees
Infrared camera	86.6 degrees

Touchpad

The following table lists the touchpad specifications of your Latitude 5540.

Table 18. Touchpad specifications

Description	Values
Touchpad resolution:	>300 DPI
Touchpad dimensions:	
Horizontal	115 mm (4.52 in.)
Vertical	67 mm (2.64 in.)
Touchpad gestures	For more information about touchpad gesture ● Windows, see the Microsoft knowledge b support.microsoft.com ● Ubuntu, see ubuntu.com/support

Power adapter

The following table lists the power adapter specifications of your Latitude 5540.

Table 19. Power adapter specifications

Description	Option one	Option two	O
Type	● 60 W AC adapter, USB-C ● 60 W AC adapter, USB-C, 2-pin	65 W AC adapter	10 C
Power-adapter dimensions:			

Table 19. Power adapter specifications (continued)

Description	Option one	Option two	O
Input frequency	50 Hz–60 Hz	50 Hz–60 Hz	5
Input current (maximum)	1.70 A	1.70 A	1.
Output current (continuous)	● 20 V/3 A (Continuous) ● 15 V/3 A (Continuous) ● 9 V/3 A (Continuous) ● 5 V/3 A (Continuous)	● 20 V/3.25 A (Continuous) ● 15 V/3 A (Continuous) ● 9 V/3 A (Continuous) ● 5 V/3 A (Continuous)	● ● ● ●
Rated output voltage	20 VDC/15 VDC/9 VDC/5 VDC	20 VDC/15 VDC/9 VDC/5 VDC	2 V
Temperature range:			
Operating	0°C to 40°C (32°F to 104°F)	0°C to 40°C (32°F to 104°F)	0° 10
Storage	-20°C to 70°C (-4°F to 158°F)	-40°C to 70°C (-40°F to 158°F)	-4 to

CAUTION: Operating and storage temperature ranges may differ among components, so operating c
the device outside these ranges may impact the performance of specific components.

Battery

The following table lists the battery specifications of your Latitude 5540.

Table 20. Battery specifications

Description	Option one	Option two	Option three
Battery type	3 cell, 42 WHr, lithium-ion, ExpressCharge + ExpressCharge Boost	3 cell, 42 WHr, lithium-ion, Long Cycle Life + ExpressCharge	3 cell, 54 WHr, lithium-ion, ExpressCharge + ExpressCharge Boost
Battery voltage	11.40 VDC	11.40 VDC	11.40 VDC
Battery weight (minimum)	0.19 kg (0.41 lb)	0.19 kg (0.41 lb)	0.22 kg (0.48 lb)
Battery dimensions:			
Height	5.73 mm (0.22 in.)	5.73 mm (0.22 in.)	5.73 mm (0.22 in.)
Width			

Table 20. Battery specifications (continued)

Description		Option one	Option two	Option three
	Operating	● Charge: 0°C to 45°C (32°F to 113°F) ● Discharge: 0°C to 70°C (32°F to 158°F)	● Charge: 0°C to 45°C (32°F to 113°F) ● Discharge: 0°C to 70°C (32°F to 158°F)	● Charge: 0°C to 45°C (32°F to 113°F) ● Discharge: 0°C to 70°C (32°F to 158°F)
	Storage	-20°C to 65°C (4°F to 149°F)	-20°C to 65°C (4°F to 149°F)	-20°C to 65°C (4°F to 149°F)
Battery operating time		Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.	Varies depending on operating conditions and can significantly reduce under certain power-intensive conditions.
Battery charging time (approximate) NOTE: Control the charging time, duration, start and end time, and so on using the Dell Power Manager application. For more information on the Dell Power Manager see, Me *and My Dell on* www.dell.com.		Express Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 45°C normal express charge ● 46°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours Standard Charge/ Predominately AC User Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours Express Charge Boost Charge Method (Fast Charge for Initial 35%): ● 16°C to 45°C target charge time from	Express Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 45°C normal express charge ● 46°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours Standard Charge/ Predominately AC User Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours	Express Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 45°C normal express charge ● 46°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours Standard Charge/ Predominately AC User Charge Method: ● 0°C to 15°C maximum allowable charge time from 0% to 100% RSOC is 4 hours ● 16°C to 50°C maximum allowable charge time from 0% to 100% RSOC is 3 hours Express Charge

Table 20. Battery specifications (continued)

Description	Option one	Option two	Option three
			is 20 mins for Accelerated Charge
Coin-cell battery	CR2032	CR2032	CR2032

CAUTION: Operating and storage temperature ranges may differ among components, so operating o the device outside these ranges may impact the performance of specific components.

CAUTION: Dell recommends that you charge the battery regularly for optimal power consumption. If battery charge is completely depleted, connect the power adapter, turn on your computer, and then re your computer to reduce the power consumption.

Display

The following table lists the display specifications of your Latitude 5540.

Table 21. Display specifications

Description	Option one	Option two	Option
Display type	15-inch Full High Definition (FHD)	15-inch Full High Definition (FHD)	15-inch (FHD), Low Bl Saving
Touch options	No	Yes	No
Display-panel technology	In-Plane Switching (IPS)	In-Plane Switching (IPS)	In-Plan
Display-panel dimensions (active area):			
Height	193.60 mm (7.62 in.)	193.60 mm (7.62 in.)	193.60
Width	344.20 mm (13.55 in.)	344.20 mm (13.55 in.)	344.20
Diagonal	396 mm (15.60 in.)	396 mm (15.60 in.)	396 mn
Display-panel native resolution	1920 x 1080	1920 x 1080	1920 x 1
Luminance (typical)	250 nits	250 nits	400 nit
Megapixels	2.07	2.07	2.07
Color gamut	45% NTSC	45% NTSC	100% s
Pixels Per Inch (PPI)	141	141	141

Table 21. Display specifications (continued)

Description	Option one	Option two	Optior
Vertical view angle	80 +/- degrees	80 +/- degrees	80 +/- (
Pixel pitch	0.179 x 0.179 mm	0.179 x 0.179 mm	0.179 x
Power consumption (maximum)	4.60 W	4.60 W	4.50 W
Anti-glare vs glossy finish	Anti-glare	Anti-glare	Anti-gl

Fingerprint reader (optional)

The following table lists the specifications of the optional fingerprint-reader of your Latitude 5540.

Table 22. Fingerprint reader specifications

Description	Values
Fingerprint-reader sensor technology	Capacitive
Fingerprint-reader sensor resolution	500 dpi
Fingerprint-reader sensor pixel size	108 x 88

Sensor

The following table lists the sensor of your Latitude 5540.

Table 23. Sensor

Sensor support
Ambient Light Sensor
Accelerometer in the base: ST Micro LIS2DW12TR
Accelerometer in the hinge-up (Upsell config with Emza/ALS/IR camera): ST Micro LNG2DMTR

GPU—Integrated

The following table lists the specifications of the integrated Graphics Processing Unit (GPU) supported by your La

Table 24. GPU—Integrated

Controller	External display support	Memory size	Proce
Intel UHD Graphics	One HDMI 2.0 port	single-channel memory	13th Ge
Intel Iris Xe Graphics	One HDMI 2.0 port	dual-channel memory	13th G

GPU—Discrete

The following table lists the specifications of the discrete Graphics Processing Unit (GPU) supported by your Latit

Table 25. GPU—Discrete

Controller	Memory size	Memory type
NVIDIA GeForce MX550	2 GB	GDDR6

External display support

The following table lists the external display support for your Latitude 5540.

Table 26. External display support

Graphics card	Supported external displays with laptop display enabled	Supported exter laptop display dis
Intel Iris Xe Graphics	3	4
Intel UHD Graphics	3	4

> NOTE: For more information about external display support, see the External Display Connection Guide on support.

Hardware security

The following table lists the hardware security of your Latitude 5540.

Table 27. Hardware security

Hardware security
Trusted Platform Module (TPM) 2.0 discrete
FIPS 140-2 certification for TPM
TCG Certificatication for TPM (Trusted Computing Group)
Finger Print Reader in Power Button tied to ControlVault 3
ControlVault 3 Advanced Authentication with FIPS 140-2 Level 3 Certification
Contacted Smart Card and ControlVault 3
Contactless Smart Card, NFC, and ControlVault 3
SED SSD NVMe, SSD and HDD (Opal and non-Opal) per SDL
FIPS 201 Full Scan FPR and ControlVault 3

Smart-card reader

Contactless smart-card reader

This section lists the contactless smart-card reader specifications of your Latitude 5540.

Table 28. Contactless smart-card reader specifications

Title	Description	Dell ControlVault 3 smart-card reader
Felica Card Support	Reader and software capable of supporting Felica contactless cards	Yes
ISO 14443 Type A Card Support	Reader and software capable of supporting ISO 14443 Type A contactless cards	Yes
ISO 14443 Type B Card Support	Reader and software capable of supporting ISO 14443 Type B contactless cards	Yes
ISO/IEC 21481	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO/IEC 18092	Reader and software capable of supporting ISO/IEC 21481 compliant contactless cards and tokens	Yes
ISO 15693 Card Support	Reader and software capable of supporting ISO15693 contactless cards	Yes
NFC Tag Support	Supports reading and processing of NFC compliant tag information	Yes
NFC Reader Mode	Support for NFC Forum Defined Reader mode	Yes
NFC Writer Mode	Support for NFC Forum Defined Writer mode	Yes
NFC Peer-to-Peer Mode	Support for NFC Forum Defined Peer to Peer mode	Yes
NFC Proximity OS Interface	Enumerates NFP (Near Field Proximity) device for OS to utilize	Yes
PC/SC OS interface	Personal Computer/Smart Card specification for integration of hardware readers into personal computer environments	Yes
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for OS level drivers	Yes
Dell ControlVault support	Device connects to Dell ControlVault for usage and processing	Yes

Table 29. Supported cards (continued)

Manufacturer	Card
	1430 1L
	DESFire D8H
	iClass (Legacy)
	iClass SEOS
NXP/Mifare	Mifare DESFire 8K White PVC Cards
	Mifare Classic 1K White PVC Cards
	NXP Mifare Classic S50 ISO Card
G&D	idOnDemand - SCE3.2 144K
	SCE6.0 FIPS 80K Dual+ 1 K Mifare
	SCE6.0 nonFIPS 80K Dual+ 1 K Mifare
	SCE6.0 FIPS 144K Dual + 1K Mifare
	SCE6.0 nonFIPS 144K Dual + 1 K Mifare
	SCE7.0 FIPS 144K
Oberthur	idOnDemand - OCS5.2 80K
	ID-One Cosmo 64 RSA D V5.4 T=0 card

Contacted smart-card reader

The following table lists the contacted smart-card reader specifications of your Latitude 5540.

Table 30. Contacted smart-card reader specifications

Title	Description	Dell ControlVault 3 reader
ISO 7816 -3 Class A Card Support	Reader capable of reading 5V powered smart mcard	Yes
ISO 7816 -3 Class B Card Support	Reader capable of reading 3V powered smart card	Yes
ISO 7816 -3 Class C Card support	Reader capable of reading 1.8V powered smart card	Yes
ISO 7816-1 Compliant	Specification for the reader	Yes
ISO 7816 -2 Compliant	Specification for smart card device physical characteristics (size, location of connection points, etc.)	Not applicable
T=0 support	Cards support character level transmission	Yes
T=1 support	Cards support block level transmission	Yes

Table 30. Contacted smart-card reader specifications (continued)

Title	Description	Dell ControlVault 3 reader
	readers into personal computer environments	
CCID driver compliance	Common driver support for Integrated Circuit Card Interface Device for OS level drivers.	Yes
Windows Certified	Device certified by WHCK	Yes
FIPS 201 (PIV/HSPD-12) Compliant via GSA	Device compliant with FIPS 201/PIV/HSPD-12 requirements	Yes

Operating and storage environment

This table lists the operating and storage specifications of your Latitude 5540.

Airborne contaminant level: G1 as defined by ISA-S71.04-1985

Table 31. Computer environment

Description	Operating	Storage
Temperature range	0°C to 35°C (32°F to 95°F)	-40°C to 65°C (-40°
Relative humidity (maximum)	10% to 90% (non-condensing)	0% to 95% (non-co
Vibration (maximum) *	0.66 GRMS	1.30 GRMS
Shock (maximum)	110 G†	160 G†
Altitude range	-15.2 m to 3048 m (-49.87 ft to 10000 ft)	-15.2 m to 10668 m ft)

> CAUTION: Operating and storage temperature ranges may differ among components, so operating or storing the device outside these ranges may impact the performance of specific components.

* Measured using a random vibration spectrum that simulates user environment.

† Measured using a 2 ms half-sine pulse.

Dell Support policy

For information on Dell support policy, search in the Knowledge Base Resource at www.dell.com/support.

ComfortView Plus

> WARNING: Prolonged exposure to blue light from the display may lead to long-term effects such as e

To reduce the risk of eye strain, it is also recommended that you:

● Position the display at a comfortable viewing distance between 20 and 28 inches (50 and 70 cm) from your eyes.
● Blink frequently to moisten your eyes, wet your eyes with water, or apply suitable eye drops.
● Look away from your display, and gaze at a distant object at 20 ft (609.60 cm) away for at least 20 seconds during each break.
● Take an extended break for 20 minutes every two hours.

Using the privacy shutter

1. Slide the privacy shutter to the left to access the camera lens.
2. Slide the privacy shutter to the right to cover the camera lens.

Figure 1. Camera shutter

Dell Optimizer

This section provides the Dell Optimizer specifications of your Latitude 5540.

● Intelligent Audio—Collaborate like you're in the same room. Intelligent Audio enhances your audio quality and re
background noises, so you can hear and be heard, creating a better conference experience for all.

For more information about configuring and using these features, see *Dell Optimizer User* *Guide.*

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Un otherwise noted, each procedure included in this document assumes that you have read the safety information that shippe with your computer.

> WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.d regulatory_compliance.

> WARNING: Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.

> CAUTION: To avoid damaging the computer, ensure that the work surface is flat, dry, and clean.

> CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching t pins and the contacts.

> CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technic assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.

> CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted meta surface to dissipate static electricity which could harm internal components.

> CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cab have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.

> CAUTION: Press and eject any installed card from the media-card reader.

> CAUTION: Exercise caution when handling rechargeable Li-ion batteries in laptops. Swollen batteries be used and should be replaced and disposed properly.

> NOTE: The color of your computer and certain components may appear differently than shown in this document.

Before working inside your computer

Steps

1. Save and close all open files and exit all open applications.

2. Shut down your computer. For Windows operating system, click Start >   Power > Shut down.

> NOTE: If you are using a different operating system, see the documentation of your operating system for shut-do

5. Remove any media card and optical disk from your computer, if applicable.
6. Enter the service mode, if you are able to power on your computer.

Service Mode

Service Mode is used to cut-off power, without disconnecting battery cable from system board prior conducting the computer.

CAUTION: If you are unable to turn on the computer to put it into Service Mode, or the computer support Service Mode, proceed to disconnect the battery cable. To disconnect the battery cable, fo steps in Removing the battery.

NOTE: Ensure that your computer is shut down and the AC adapter is disconnected.

a. Hold <B> key on the keyboard and press the power button for 3 seconds or until the Dell logo appears on the scree
b. Press any key to continue.
c. If the AC adapter is not disconnected, a message prompting you to remove the AC adapter appears on the screen. Remove the AC adapter and then press any key to continue the Service Mode process. The Service Mode proces automatically skips the following step if the Owner Tag of the computer is not set up in advance by the user.
d. When the ready-to-proceed message appears on the screen, press any key to proceed. The computer emit beeps and shuts down immediately.
e. Once the computer shuts down, it has successfully entered Service Mode.

NOTE: If you are unable to power on your computer or unable to enter Service Mode, skip this process.

Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructio

Observe the following safety precautions before you perform any installation or break/fix procedures involving disa reassembly:
● Turn off the system and all attached peripherals.
● Disconnect the system and all attached peripherals from AC power.
● Disconnect all network cables, telephone, and telecommunications lines from the system.
● Use an ESD field service kit when working inside any to avoid electrostatic discharge (ESD) damage.
● After removing any system component, carefully place the removed component on an anti-static mat.
● Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing, and holding the power button for 15 seconds should discharge residual power in the system board.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done throu the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now highe[r] in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

● Catastrophic – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage c[auses] an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that ha[s] received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for mis[sing] nonfunctional memory.
● Intermittent – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms rel[ated to] the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of [memory] integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking w[ounded"]) failure.

Perform the following steps to prevent ESD damage:

● Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they [do not] provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection o[n parts] with increased sensitivity to ESD damage.
● Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench [pads.]
● When unpacking a static-sensitive component from its shipping carton, do not remove the component from the [anti-static] packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure tha[t you] discharge static electricity from your body.
● Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main comp[onents:] anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

● Anti-Static Mat – The anti-static mat is dissipative and parts can be placed on it during service procedures. Whe[n using an] anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare [metal] on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and place[d directly] on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
● Wrist Strap and Bonding Wire – The wrist strap and bonding wire can be either directly connected between you[r wrist] and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware [that] is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the [ESD] mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Nev[er] use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal w[ear] and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. [It is] recommended to test the wrist strap and bonding wire at least once per week.
● ESD Wrist Strap Tester – The wires inside of an ESD strap are prone to damage over time. When using an unmonitore[d] kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A [wrist] wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your [regional] regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while [it is] strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an ala[rm] sounds if the test fails.
● Insulator Elements – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from in[ternal]

- ESD Packaging – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, stati
  bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging tha
  new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material shoul
  used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only a
  ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the
  shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- Transporting Sensitive Components – When transporting ESD sensitive components such as replacement parts
  to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended to use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when
servicing Dell products. In addition, it is critical to keep sensitive parts separate from all insulator parts while performing se
and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to pla
these parts in anti-static bags for safe transport.

After working inside your computer

About this task

> NOTE: Leaving stray or loose screws inside your computer may severely damage your computer.

Steps

1. Replace all screws and ensure that no stray screws remain inside your computer.

2. Connect any external devices, peripherals, or cables you removed before working on your computer.

3. Replace any media cards, discs, or any other parts that you removed before working on your computer.

4. Connect your computer and all attached devices to their electrical outlets.

5. Turn on your computer.

BitLocker

> CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the syst
> will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress, a
> the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or
> an unnecessary operating system reinstall. For more information about this subject, see Knowledge A
> updating the BIOS on Dell systems with BitLocker enabled.

The installation of the following components triggers BitLocker:

- Hard disk drive or solid state drive
- System board

Recommended tools

Screw list

Table 32. Screw list

Component	Screw type	Quantity	Screw imag
5G WWAN bracket	M2x3	1	
5G WWAN thermal shield	M2x3	2	
M.2 2230 Solid-state drive in Slot 1 and Slot 2	M2x3	1	
Solid-state drive thermal shield in Slot 1	M2x3	2	
Assembly-inner frame	M2x3	12	
System fan	M2x4	2	
Heat sink	M2x4	1	
Display cable	M2x3	2	
Type-C bracket	M2x4	3	
System board	M2x3	3	
Power button	M2x2.5	2	
Keyboard	M2x2	21	
Display assembly	M2x3	2	

Table 32. Screw list (continued)

Component	Screw type	Quantity	Screw image
Smart-card reader	M2x2	2	

Major components of Latitude 5540

The following image shows the major components of Latitude 5540.

1. Base cover
3. Heat sink
5. Speakers

7. Smart card reader (optional)
9. Right hinges
11. Camera module
13. Display panel
15. Display back cover
17. Left hinges
19. Keyboard
21. Power button
23. Fingerprint reader
25. 4G WWAN card
27. WLAN card

2. Battery
4. System fan
6. M.2 2230/2280 solid-state drive thermal s
   state drive Slot 1

8. System board
10. Touchpad
12. Display bezel
14. Display cable
16. Sensor board with cable
18. Palm-rest assembly
20. Coin-cell battery
22. Assembly inner frame
24. Memory module
26. 4G WWAN card bracket

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. T parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representat purchase options.

Removing and installing Cust[...]
Replaceable Units (C[...]

The replaceable components in this chapter are Customer Replaceable Units (CRUs).

CAUTION: Customers can replace only the Customer Replaceable Units (CRUs) following the safety precau[...] and replacement procedures.

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

SIM card tray (Optional)

Removing the SIM card tray (Optional)

Prerequisites

1. Follow the procedure in   Before working inside your   computer.

NOTE: The procedure for SIM card tray removal is only applicable for computers that are shipped with a WWAN mod[...]

CAUTION: Removing the SIM card when the computer is turned on might cause data loss or damage to the [...] Ensure that your computer is turned off or the network connections are disabled.

About this task

Steps

1. Insert a pin into the release hole to release the SIM card tray.

2. Push the pin to disengage the lock, and eject the SIM card tray.

3. Slide the SIM card tray out of the slot on the computer.

4. Remove the SIM card from the SIM card tray.

5. Slide and push the SIM card tray back into the slot.

Installing the SIM card tray (Optional)

Prerequisites

NOTE: The procedure for SIM card tray installation is only applicable for computers that are shipped with a WWAN

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

Steps

1. Insert a pin into the release hole to release the SIM card tray.
2. Push the pin to disengage the lock, and eject the SIM card tray.
3. Slide the SIM card tray out of the slot on the computer.
4. Align and place the SIM card in the dedicated slot on the SIM card tray, with the metallic contact of the SIM card facing
5. Align the SIM card tray with the slot on the computer and carefully slide it in.
6. Slide the SIM card tray into the slot, until it clicks into place.

Next steps

1. Follow the procedure in computer.

Base cover

2. Remove the SIM card.

About this task

The following images indicate the location of the base cover and provide a visual representation of the removal procedure

Steps

1. Loosen the eight captive screws that secure the base cover to the palm-rest assembly.

2. Using a plastic scribe, pry open the base cover from the recesses located in the U-shaped indents at the top edge of th
   base cover near the hinges.

3. Lift the base cover off the keyboard and palm-rest assembly.

   NOTE: Ensure that your computer is in Service Mode. If your computer is unable to enter Service Mode, discor
   battery cable from the system board. To disconnect the battery cable, follow step 4 and 5.

4. Disconnect the battery cable from the system board.

About this task

The following images indicate the location of the base cover and provide a visual representation of the installation proced

If battery is not a pre-requisite and if you have disconnected the battery cable, ensure to connect the battery cable. T
connect the battery cable, follow step 1 and step 2 in the procedure.

Steps

1. Connect the battery cable to the connector on the system board.
2. Align the screw holes on the base cover with the screw holes on the palm-rest and keyboard assembly, and then snap base cover into place.
3. Tighten the eight captive screws that secure the base cover to the palm-rest and keyboard assembly.

Next steps

1. Install the SIM card.
2. Follow the procedure in After working inside your computer.

NOTE: Ensure that your computer is in Service Mode. For more information, see Before working i

Wireless card

Removing the WLAN card

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   base cover.

About this task

The following image(s) indicate the location of the WLAN card and provides a visual representation of the removal proced

Installing the WLAN card

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the WLAN card and provides a visual representation of the installation proc

Steps

1. Connect the antenna cables to the WLAN card.

   The following table provides the antenna-cable color scheme for the WLAN card that is supported by your computer.

2. Align the notch on the WLAN card with the tab on the WLAN-card slot. .

3. Adhere the WLAN card at an angle into the WLAN-card slot

4. Align the screw hole on the WLAN-card bracket with the screw hole on the WLAN card and palm-rest and keyboard assembly.

5. Place the screw (M2x3) that secures the WLAN-card bracket to the WLAN card and the palm-rest and keyboard assem

Next steps

1. Install the base cover.
2. Follow the procedure in After working inside your computer.

WWAN card (Optional)

Removing the 4G WWAN card (Optional)

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

About this task

NOTE: The following steps are for computers with WWAN support.

The following image(s) indicate the location of the 4G WWAN card and provides a visual representation of the removal procedure.

Steps

1. Lift the 4G WWAN-card shield off the 4G WWAN card.

2. Remove the screw (M2x3) that secures the 4G WWAN-card bracket to the 4G WWAN card.

3. Lift the 4G WWAN-card bracket off the 4G WWAN card.

4. Disconnect the antenna cables from the 4G WWAN card.

5. Slide and remove the 4G WWAN card off the 4G WWAN-card slot on the system board.

Installing the 4G WWAN card (Optional)

Prerequisites

Steps

1. Align the notch on the 4G WWAN card with the tab on the 4G WWAN-card slot.
2. Insert the 4G WWAN card at an angle into the 4G WWAN-card slot .
3. Connect the antenna cables to the 4G WWAN card.

The following table provides the antenna-cable color scheme for the 4G WWAN card that is supported by your compu

Table 34. Antenna-cable color scheme

Connectors on the WWAN card	Antenna-cable color	Silkscreen marking	
D/G	Black with a thin white stripe	6 Aux	△ (white triangle)

5. Replace the screw (M2x3) that secures the 4G WWAN bracket to the 4G WWAN card.

6. Align and place the 4G WWAN-card shield over the 4G WWAN card.

Next steps

1. Install the base cover.
2. Follow the procedure in After working inside your computer.

Removing the 5G WWAN card (Optional)

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

About this task

> NOTE: The following steps are for computers with WWAN support.

The following image(s) indicate the location of the 5G WWAN card and provides a visual representation of the removal procedure.

Steps

1. Remove the screw (M2x3) that secures the 5G WWAN-card bracket to the 5G WWAN card.
2. Lift the 5G WWAN-card bracket off the 5G WWAN card.
3. Remove the two screws (M2x3) that secure the 5G WWAN-card shield to the palm-rest and keyboard assembly
4. Lift the 5G WWAN-card shield off the 5G WWAN card.
5. Disconnect the antenna cables from the 5G WWAN card.
6. Slide and remove the 5G WWAN card off the 5G WWAN-card slot on the system board.

Installing the 5G WWAN card (Optional)

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

> NOTE: The following steps are for computers with WWAN support.

The following image(s) indicate the location of the 5G WWAN card and provides a visual representation of the installation
procedure.

Steps

1. Connect the antenna cables to the 5G WWAN card.

    The following table provides the antenna-cable color scheme for the 5G WWAN card that is supported by your compu

Table 35. Antenna-cable color scheme

Connectors on the WWAN card	Antenna-cable color	Silkscreen marking	
D/G	Black with a thin white stripe	ANT3 D/G	△ (white triangle)
M2	Blue	ANT2 M2	△ (white triangle)
M1	Orange	ANT1 M1	△ (white triangle)
M	White with a thin gray stripe	ANT0 M	△ (white triangle)

2. Align the notch on the 5G WWAN card with the tab on the 5G WWAN-card slot.

3. Insert the 5G WWAN card at an angle into the 5G WWAN-card slot .

4. Align the screw holes on the 5G WWAN-card shield with the screw holes on the palm-rest and keyboard assembly.

5. Replace the two screws (M2x3) that secure the 5G WWAN-card shield to the palm-rest and keyboard assembly

6. Align the screw hole on the 5G WWAN-card bracket with the screw hole on the 5G WWAN card.

7. Replace the screw (M2x3) that secures the 5G WWAN bracket to the 5G WWAN card.

Next steps

1. Install the   base cover.
2. Follow the procedure in   After working inside your   computer.

Memory modules

Removing the memory module

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   SIM card.
3. Remove the   base cover.

About this task

The following image(s) indicate the location of the memory module and provides a visual representation of the removal procedure.

Steps

1. Using your fingertips, spread apart the securing clips on the memory-module slot until the memory module pops up.

2. Slide and remove the memory module from the memory-module slot on the system board.

> NOTE: Repeat step 1 and step 2 if there are more than one memory module installed on your computer.

Installing the memory module

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the memory module and provides a visual representation of the installation procedure.

Steps

1. Align the notch on the memory module with the tab on the memory-module slot.

2. Slide the memory module firmly into the slot at an angle and press the memory module down until it clicks into place.

> NOTE: If you do not hear the click, remove the memory module and reinstall it.

Next steps

1. Install the base cover.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

Solid-state drive

Removing the M.2 2230 solid-state drive from Slot 1

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.

About this task

The following image(s) indicate the location of the M.2 2230 solid-state drive in Slot 1 and provides a visual representation of the removal procedure.

Steps

1. Remove the two screws (M2x3) that secure the solid-state drive thermal shield to the palm-rest assembly.
2. Lift the solid-state drive thermal shield off the palm-rest assembly.
3. Remove the screw (M2x3) that secures the M.2 2230 solid-state drive to the solid-state drive bracket and palm
   assembly.
4. Slide and lift the M.2 2230 solid-state drive off the solid-state drive slot.
5. Remove the M.2 2230 solid-state drive mounting bracket from the palm-rest assembly.

Installing the M.2 2230 solid-state drive in Slot 1

Prerequisites

Steps

1. Place the M.2 2230 solid-state drive mounting bracket on its slot on the palm-rest assembly.

2. Align the notch on the M.2 2230 solid-state drive with the tab on the M.2 2230 solid-state drive slot.

3. Slide the M.2 2230 solid-state drive into the M.2 2230 solid-state drive slot.

4. Replace the screw (M2x3) that secures the M.2 2230 solid-state drive to the solid-state drive mounting bracket palm-rest assembly.

5. Align the screw holes on the solid-state drive thermal shield with the screw holes on the M.2 2230 solid-state drive and palm-rest assembly.

6. Replace the two screws (M2x3) that secure the solid-state drive thermal shield to the M.2 2230 solid-state drive palm-rest assembly.

Next steps

Removing the M.2 2280 solid-state drive from Slot 1

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   SIM card.
3. Remove the   base cover.

About this task

The following image(s) indicate the location of the M.2 2280 solid-state drive in Slot 1 and provides a visual representation of
the removal procedure.

Installing the M.2 2280 solid-state drive in Slot 1

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the M.2 2280 solid-state drive in Slot 1 and provides a visual representation of the installation procedure.

Steps

1. Place the M.2 2280 solid-state drive holder on its slot on the palm-rest assembly.

Next steps

1. Install the [base](link) cover.
2. Install the [SIM](link) card.
3. Follow the procedure in [After working inside your](link) computer.

Removing the M.2 2230 solid-state drive from Slot 2

Prerequisites

1. Follow the procedure in [Before working inside your](link) computer.
2. Remove the [SIM](link) card.
3. Remove the [base](link) cover.

About this task

The following image(s) indicate the location of the M.2 2230 solid-state drive in Slot 2 and provides a visual representation of the removal procedure.

2. Slide and lift the M.2 2230 solid-state drive off the solid-state drive slot.

Installing the M.2 2230 solid-state drive in Slot 2

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the M.2 2230 solid-state drive in Slot 2 and provides a visual representation
the installation procedure.

2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

Fan

Removing the fan

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.

About this task

The following image(s) indicate the location of the fan and provides a visual representation of the removal procedure.

Steps

1. Disconnect the fan cable from the system board.

2. Remove the fan cable from the routing guides on the palm-rest assembly.

3. Remove the two screws (M2x4) that secure the fan to the palm-rest assembly.

4. Lift the fan off the palm-rest assembly.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the fan and provides a visual representation of the installation procedure.

Steps

1. Align the screw holes on the fan with the screw holes on the palm-rest assembly.

2. Replace the two screws (M2x4) that secure the fan to the palm-rest assembly.

3. Route the fan cable through the routing guides on the palm-rest assembly.

4. Connect the fan cable to the system board.

Next steps

1. Install the base cover.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

Removing and installing Field Replace
Units (

The replaceable components in this chapter are Field Replaceable Units (FRUs).

CAUTION: The information in this section is intended for authorized service technicians only.

CAUTION: To avoid any potential damage to the component or loss of data, ensure that an authorized servic technician replaces the Field Replaceable Units (FRUs).

CAUTION: Dell Technologies recommends that this set of repairs, if needed, to be conducted by trained technical repair specialists.

CAUTION: As a reminder, your warranty does not cover damages that may occur during the courses of FRU repairs that are not authorized by Dell Technologies.

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Battery

Rechargeable Li-ion battery precautions

CAUTION:
● Exercise caution when handling rechargeable Li-ion batteries.
● Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer turns on when the power button is pressed.
● Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
● Do not expose the battery to high temperatures, or disassemble battery packs and cells.
● Do not apply pressure to the surface of the battery.
● Do not bend the battery.
● Do not use tools of any kind to pry on or against the battery.
● Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.
● If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a rechargeable Li-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.
● Always purchase genuine batteries from   www.dell.com or authorized Dell partners and resellers.
● Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how handle and replace swollen rechargeable Li-ion batteries, see   Handling swollen rechargeable L

Removing the battery

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.

About this task

> CAUTION: Removing the battery resets the BIOS setup program's settings to default. It is recommen
> you note the BIOS setup program's settings before removing the battery.

The following image(s) indicate the location of the battery and provides a visual representation of the removal procedure.

Steps

1. Disconnect the battery cable from the system board (if not disconnected earlier).

2. Loosen the five captive screws that secure the battery to the palm-rest assembly.

3. Lift the battery off the palm-rest assembly.

4. Flip the battery and peel the tape that adheres the battery cable to the battery.

5. Remove the battery cable from the routing guides on the battery.

6. Disconnect the battery cable from the connector on the battery.

7. Remove the battery cable away from the battery.

Installing the battery

About this task

The following image(s) indicate the location of the battery and provides a visual representation of the installation p

Steps

1. Align and route the battery cable through the routing guides on the battery.
2. Adhere the tape that secures the battery cable to the battery.
3. Connect the battery cable to the connector on the battery.
4. Flip the battery.
5. Using the alignment posts, place the battery on the palm-rest assembly.
6. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
7. Tighten the five captive screws that secure the battery to the palm-rest assembly.

Assembly inner frame

Removing the assembly-inner frame

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   SIM card.
3. Remove the   base cover.
4. Remove the battery.
5. Remove the   4G WWAN card   or 5G WWAN   card, as applicable.
6. Remove the   WLAN card.

About this task

The following images indicate the location of the assembly-inner frame and provide a visual representation of the removal procedure.

Figure 2. Inner frame removal

Steps

1. Remove the antenna cables from the routing guides on the palm-rest assembly.

2. Disconnect the speaker cable from the system board.

3. Remove the speaker cables from the routing guides on the palm-rest assembly.

4. Remove the twelve screws (M2x3) that secure the assembly-inner frame to the palm-rest assembly.

5. Remove the assembly-inner frame off the palm-rest assembly.

Installing the assembly-inner frame

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the assembly-inner frame and provide a visual representation of the installat
procedure.

Steps

1. Align the screw holes on the assembly-inner frame with the screw holes on the system board and the palm-rest assembly.

2. Replace the twelve screws (M2x3) that secure the assembly-inner frame to the palm-rest assembly.

3. Connect the speaker cable to the system board.

4. Route the speaker cables through the routing guides on the palm-rest assembly.

5. Route the antenna cables through the routing guides on the palm-rest assembly.

Next steps

1. Install the WLAN card.
2. Install the 4G WWAN card or 5G WWAN card, as applicable.
3. Install the battery.
4. Install the base cover.
5. Install the SIM card.
6. Follow the procedure in After working inside your computer.

Speakers

Removing the speakers

About this task

The following images indicate the location of the speakers and provide a visual representation of the removal procedure.

Steps

1. Disconnect the speaker cable from the system board.

2. Remove the speaker cables from the routing guides on the palm-rest assembly.

3. Lift the right and left speakers, along with its cable, off the palm-rest assembly.

Installing the speakers

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the speakers and provide a visual representation of the installation procedur

Steps

1. Using the alignment posts, place the left and right speakers into their slots on the palm-rest assembly.

2. Route the speaker cable through the routing guides on the palm-rest assembly.

3. Connect the speaker cable to the system board.

Next steps

1. Install the base cover.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

Coin-cell battery

Removing the coin-cell battery

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the assembly-inner frame.

About this task

Steps

1. Disconnect the coin-cell battery cable from the system board.
2. Peel the coin-cell battery, along with its cable, off the palm-rest assembly.

Installing the coin-cell battery

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the coin-cell battery and provides a visual representation of the ins
procedure.

Steps

1. Adhere the coin-cell battery on to the coin-cell battery slot on the palm-rest assembly.
2. Connect the coin-cell battery cable to the connector on the system board.

Next steps

1. Install the assembly-inner frame.
2. Install the battery.
3. Install the base cover.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

Heat sink

Removing the heat sink (Discrete GPU)

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.

Steps

1. Loosen the seven captive screws that secure the heat sink to the system board.

NOTE: Loosen the captive screws in the reverse sequential order mentioned on the heat sink [7 > 6 > 5 > 4 > 3

NOTE: The number of screws varies depending on the configuration ordered.

2. Remove the screw (M2x4) that secures the heat sink to the system board.
3. Lift the heat sink from the system board.

Installing the heat sink (Discrete GPU)

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

NOTE: If either the system board or the heat sink is replaced, use the thermal grease provided in the kit to ensure thermal conductivity is achieved.

The following images indicate the location of the heat sink and provide a visual representation of the installation procedure

Steps

1. Place the heat sink on the system board.
2. Tighten the seven captive screws that secure the heat sink to the system board.

> NOTE: Tighten the captive screws in the sequential order mentioned on the heat sink [1 > 2 > 3 > 4 >5 > 6 > 7]

> NOTE: The number of screws varies depending on the configuration ordered.

3. Replace the screw (M2x4) that secures the heat sink to the system board.

Next steps

1. Install the base cover.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

Removing the heat sink (Integrated GPU)

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.

Steps

1. Loosen the four captive screws that secure the heat sink to the system board.

> NOTE: Loosen the captive screws in the reverse sequential order mentioned on the heat sink [4 > 3 > 2 > 1].

> NOTE: The number of screws varies depending on the configuration ordered.

2. Remove the screw (M2x4) that secures the heat sink to the system board.
3. Lift the heat sink from the system board.

Installing the heat sink (Integrated GPU)

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

> NOTE: If either the system board or the heat sink is replaced, use the thermal grease provided in the kit to ensure t
> thermal conductivity is achieved.

The following images indicate the location of the heat sink and provide a visual representation of the installation procedur

Steps

1. Place the heat sink on the system board.

2. Tighten the four captive screws that secure the heat sink to the system board.

> NOTE: Tighten the captive screws in the sequential order mentioned on the heat sink [1 > 2 > 3 > 4].

> NOTE: The number of screws varies depending on the configuration ordered.

3. Replace the screw (M2x4) that secures the heat sink to the system board.

Next steps

1. Install the base cover.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

System board

Removing the system board

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

9. Remove the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
10. Remove the battery.
11. Remove the assembly-inner frame.

About this task

The following images indicate the system board connectors.

1. WWAN-card connector	2. WLAN-card connector
3. Sensor board-cable connector	4. Memory modules
5. Display-cable connector	6. System-fan connector
7. Solid-state drive Slot 1	8. Touchpad-cable connector
9. Battery-cable connector	10. Solid-state drive Slot 2
11. USH-cable connector	12. Coin-cell battery cable connector
13. Speaker-cable connector	

The following images indicate the location of the system board and provide a visual representation of the removal procedu

6. Disconnect the sensor board-cable from the connector on the system board.

7. Disconnect the display cable from the connector on the system board.

8. Remove the display cable from the routing guides on the system board.

9. Disconnect the fan cable from the connector on the system board.

10. Open the latch and disconnect the touchpad cable from the connector on the system board.

11. Open the latch and disconnect the USH cable from the USH module.

12. Disconnect the coin-cell battery cable from the connector on the system board.

13. Remove the three screws (M2x3) that secure the system board to the palm-rest assembly.

14. Lift the system board off the palm-rest assembly.

Installing the system board

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the system board connectors.

1. WWAN-card connector
2. WLAN-card connector
3. Sensor board-cable connector
4. Memory modules
5. Display-cable connector
6. System-fan connector
7. Solid-state drive Slot 1
8. Touchpad-cable connector
9. Battery-cable connector
10. Solid-state drive Slot 2
11. USH-cable connector
12. Coin-cell battery cable connector
13. Speaker-cable connector

Steps

1. Align and place the system board on its slot on the palm-rest assembly.
2. Replace the three screws (M2x3) that secure the system board to the palm-rest assembly.
3. Connect the sensor board-cable to the connector on the system board.
4. Connect the display cable to the connector on the system board.
5. Route the display cable through the routing guides on the system board.
6. Connect the fan cable to the connector on the system board.
7. Connect the touchpad cable to the connector on the system board and close the latch.

Next steps

1. Install the assembly-inner frame.
2. Install the battery.
3. Install the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
4. Install the M.2 2230 solid-state drive in Slot 2, if applicable.
5. Install the M.2 2230 or M.2 2280 solid-state drive in Slot 1, as applicable.
6. Install the memory modules.
7. Install the WLAN card.
8. Install the 4G WWAN card or 5G WWAN card, as applicable.
9. Install the base cover.
10. Install the SIM card.
11. Follow the procedure in After working inside your computer.

Power button

Removing the power button

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the 4G WWAN card or 5G WWAN card, as applicable.
6. Remove the WLAN card.
7. Remove the memory modules.
8. Remove the M.2 2230 or M.2 2280 solid-state drive from Slot 1, as applicable.
9. Remove the M.2 2230 solid-state drive from Slot 2, if applicable.
10. Remove the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
11. Remove the assembly-inner frame.
12. Remove the system board.

About this task

The following images indicate the location of the power button and provide a visual representation of the removal procedu

Steps

1. Remove the two (M2x2.5) screws that secure the power button to the palm-rest assembly.

2. Lift the power button off the palm-rest assembly.

Installing the power button

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the power board and provide a visual representation of the installation proce

Steps

1. Align and place the power button on the palm-rest assembly.

2. Replace the two (M2x2.5) screws to secure the power button to the palm-rest assembly.

Next steps

1. Install the system board.
2. Install the assembly-inner frame.
3. Install the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
4. Install the M.2 2230 solid-state drive in Slot 2, if applicable.
5. Install the M.2 2230 or M.2 2280 solid-state drive in Slot 1, as applicable.
6. Install the memory modules.
7. Install the WLAN card.
8. Install the 4G WWAN card or 5G WWAN card, as applicable.
9. Install the battery.
10. Install the base cover.
11. Install the SIM card.
12. Follow the procedure in After working inside your computer.

Power button with optional fingerprint reade

Removing the power button with optional fingerprint re

5. Remove the 4G WWAN card or 5G WWAN card, as applicable.
6. Remove the WLAN card.
7. Remove the memory modules.
8. Remove the M.2 2230 or M.2 2280 solid-state drive from Slot 1, as applicable.
9. Remove the M.2 2230 solid-state drive from Slot 2, if applicable.
10. Remove the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
11. Remove the assembly-inner frame.
12. Remove the system board.

About this task

The following images indicate the location of the power button and provide a visual representation of the removal procedu

Steps

1. Remove the two (M2x2.5) screws that secure the power button to the palm-rest assembly.
2. Lift the power button off the palm-rest assembly.

Installing the power button with optional fingerprint rea

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

Steps

1. Align and place the power button on the palm-rest assembly.

2. Replace the two (M2x2.5) screws to secure the power button to the palm-rest assembly.

Next steps

1. Install the system board.
2. Install the assembly-inner frame.
3. Install the heat sink (discrete GPU) or heat sink (integrated GPU), as applicable.
4. Install the M.2 2230 solid-state drive in Slot 2, if applicable.
5. Install the M.2 2230 or M.2 2280 solid-state drive in Slot 1, as applicable.
6. Install the memory modules.
7. Install the WLAN card.
8. Install the 4G WWAN card or 5G WWAN card, as applicable.
9. Install the battery.
10. Install the base cover.
11. Install the SIM card.
12. Follow the procedure in After working inside your computer.

Keyboard

Removing the keyboard

5. Remove the 4G WWAN card or 5G WWAN card, as applicable.
6. Remove the WLAN card.
7. Remove the memory modules.
8. Remove the M.2 2230 or M.2 2280 solid-state drive from Slot 1.
9. Remove the M.2 2230 solid-state drive from Slot 2.
10. Remove the heat sink.
11. Remove the assembly inner frame.
12. Remove the system board.

About this task

The following images indicate the location of the keyboard and provide a visual representation of the removal procedure.

Steps

1. Open the latch and disconnect the keyboard cable from the touchpad.
2. Open the latch and disconnect the keyboard-backlight cable from the touchpad.
3. Remove the twenty one screws (M2x2) that secure the keyboard bracket to the palm-rest assembly.
4. Lift the keyboard bracket off the palm-rest assembly.
5. Turn the keyboard bracket over.
6. Remove the ten screws (M2x2) that secure the keyboard to the keyboard bracket.
7. Lift the keyboard off the keyboard bracket.

Installing the keyboard

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the keyboard and provide a visual representation of the installation procedur

2. Replace the ten screws (M2x2) to secure the keyboard to the keyboard bracket.

3. Turn the keyboard bracket over.

4. Align and place the keyboard bracket on the palm-rest assembly.

5. Replace the twenty one screws (M2x2) that secure the keyboard bracket to the palm-rest assembly.

6. Connect the keyboard-backlight cable to the connector on the system board and close the latch to secure the cable.

7. Connect the keyboard cable to the connector on the system board and close the latch to secure the cable.

Next steps

1. Install the   system   board.
2. Install the   assembly inner   frame.
3. Install the   heat sink.
4. Install the   M.2 2230 solid-state drive in Slot   2.
5. Install the   M.2 2230   or M.2 2280   solid-state drive in Slot 1.
6. Install the   memory   modules.
7. Install the   WLAN card.
8. Install the   4G WWAN card   or 5G WWAN   card, as applicable.
9. Install the battery.
10. Install the   base cover.
11. Install the   SIM card.
12. Follow the procedure in   After working inside your   computer.

Display assembly

Removing the display assembly

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   SIM card.
3. Remove the   base cover.
4. Remove the   4G WWAN card   or 5G WWAN   card, as applicable.
5. Remove the   WLAN card.

About this task

The following images indicate the location of the display assembly and provide a visual representation of the removal pro

Steps

1. Remove the two (M2x3) screws that secure the display-cable bracket to the system board.
2. Lift the display-cable bracket off the palm-rest assembly.
3. Disconnect the display cable from the system board.
4. Remove the display cable from the routing guides on the system board.
5. Lift up the black flap near the antenna cables and uncover the sensor-board cable.
6. Disconnect the sensor-board cable from the connector on the system board.
7. Remove the WLAN and WWAN antennas (where applicable) from the routing guides on the system board.
8. Remove the six screws (M2.5x5) that secure the left and right display hinges to the palm-rest assembly.
9. Carefully lift the display assembly from the palm-rest assembly.
10. Carefully place the display assembly on a clean, flat surface.

Installing the display assembly

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display assembly and provide a visual representation of the installation procedure.

Steps

1. Place the palm-rest assembly at the edge of the table with the speakers facing away from the edge.

2. Align the screw holes on the palm-rest assembly with the screw holes on the display hinges.

3. Replace the six screws (M2.5x5) that secure the left and right display hinges to the palm-rest assembly.

4. Connect the sensor-board cable to the connector on the system board.

5. Cover the sensor-board cable with the black flap near the antenna cables.

6. Route the WLAN and WWAN antennas (where applicable) from the routing guides on the system board.

7. Connect the display cable to the system board.

8. Adhere the tape that secures the display cable to the system board.

9. Align the screw holes on the display-cable bracket with the screw holes on the system board.

10. Replace the two (M2x3) screws that secure the display cable bracket to the system board.

Display bezel

Removing the display bezel

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.
4. Remove the 4G WWAN card or 5G WWAN card, as applicable.
5. Remove the WLAN card.
6. Remove the display assembly.

About this task

The following images indicate the location of the display bezel and provide a visual representation of the removal procedu

Steps

1. Carefully pry up the display bezel starting from the recesses on the bottom edge of the display near the left and right hi
2. Pry along the outside edge of the display bezel and work your way around the entire display bezel until the display beze
   separated from the display cover.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display bezel and provide a visual representation of the installation proce

Steps

1. Align and place the display bezel on the display assembly.

2. Gently snap the display bezel into place.

Next steps

1. Install the display assembly.
2. Install the WLAN card.
3. Install the 4G WWAN card or 5G WWAN card, as applicable.
4. Install the base cover.
5. Install the SIM card.
6. Follow the procedure in After working inside your computer.

Display panel

Removing the display panel

4. Remove the 4G WWAN card or 5G WWAN card, as applicable.
5. Remove the WLAN card.
6. Remove the display assembly.
7. Remove the display bezel.

About this task

The following images indicate the location of the display panel and provide a visual representation of the removal procedu

Installing the display panel

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display panel and provide a visual representation of the installation proce

Steps

1. Connect the display cable to the connector on the display panel and close the latch.

2. Adhere the conductive tape to secure the display cable to the display panel.

3. Close the display panel and the display back cover to assemble.

   NOTE: Ensure that the display panel tabs are inserted into the slots on the display cover.

4. Replace the four screws (M2.5x3.5) to secure the display panel to the display back cover.

Next steps

1. Install the display bezel.
2. Install the display assembly.
3. Install the WLAN card.
4. Install the 4G WWAN card or 5G WWAN card, as applicable.
5. Install the base cover.

Camera module

Removing the camera module

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.
4. Remove the 4G WWAN card or 5G WWAN card, as applicable.
5. Remove the WLAN card.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task

The following images indicate the location of the camera module and provide a visual representation of the removal proce

Steps

1. Peel the tape that secures the camera cable to the to the display back cover.

2. Disconnect the camera cable from the camera.

3. Carefully pry up the camera module starting from the prying point at the bottom edge of the camera module.

4. Lift the camera module from the display back cover.

Installing the camera module

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the camera module and provide a visual representation of the installation procedure.

Steps

1. Align and place the camera module into the slot on the display back cover.

2. Connect the camera module cable to the connector on the camera module.

3. Adhere the tape to secure the camera cable to the camera.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN card.
5. Install the 4G WWAN card or 5G WWAN card, as applicable.
6. Install the base cover.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Display hinges

Removing the display hinges

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the base cover.
4. Remove the 4G WWAN card or 5G WWAN card, as applicable.
5. Remove the WLAN card.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task

The following images indicate the location of the display hinges and provide a visual representation of the removal proced

Steps

1. Remove the screw (M2.5x3.5) that secures the right hinge to the display back cover.

2. Lift and remove the right hinge from the display back cover.

3. Remove the screw (M2.5x3.5) that secures the left hinge to the display back cover.

4. Lift and remove the left hinge from the display back cover.

Installing the display hinges

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display hinges and provide a visual representation of the installation proc

Steps

1. Align the screw hole on the left hinge with the screw hole on the display back cover.

2. Replace the screw (M2.5x3.5) that secures the left hinge to the display back cover.

3. Align the screw hole on the right hinge with the screw hole on the display back cover.

4. Replace the screw (M2.5x3.5) that secures the right hinge to the display back cover.

Next steps

1. Install the   display panel.
2. Install the   display bezel.
3. Install the   display assembly.
4. Install the   WLAN card.
5. Install the   4G WWAN card   or 5G WWAN   card, as applicable.
6. Install the   base cover.
7. Install the   SIM card.
8. Follow the procedure in   After working inside your   computer.

Display back cover

Removing the display back cover

CAUTION: The information in this section is intended for authorized service technicians only.

7. Remove the display bezel.

8. Remove the display panel.

About this task

The following images indicate the location of the display back cover and provide a visual representation of the removal procedure.

Steps

After performing the steps in the pre-requisites, we are left with the display back cover.

Installing the display back cover

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display back cover and provide a visual representation of the installation procedure.

Steps

Place the display back cover on a flat surface.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN card.
5. Install the 4G WWAN card or 5G WWAN card, as applicable.
6. Install the base cover.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Display cable

Removing the display cable

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

The following images indicate the location of the display cable and provide a visual representation of the removal procedu

Steps

1. Peel the tape that secures the display cable to the display back cover.

2. Disconnect the display cable from the camera module.

3. Peel the display cable to release it from adhesive and lift the display cable off the display back cover.

Installing the display cable

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the display cable and provide a visual representation of the installation proce

Steps

1. Connect the display cable to the connector on the camera.
2. Adhere the display cable to the display back cover.
3. Adhere the tape that secures the display cable to the display back cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN card.
5. Install the 4G WWAN card or 5G WWAN card, as applicable.
6. Install the base cover.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Sensor board

Removing the sensor board

CAUTION: The information in this section is intended for authorized service technicians only.

7. Remove the display bezel.
8. Remove the display panel.

About this task

The following images indicate the location of the sensor board and provide a visual representation of the removal procedu

Steps

1. Remove the sensor-board cable from the routing guides on the display back cover.

2. Lift the sensor board, along with its cable, off the display back cover.

Installing the sensor board

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the sensor board and provide a visual representation of the installation proce

Steps

1. Place the sensor board on its slot on the display back cover.

2. Route the sensor-board cable through the routing guides on the display back cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN card.
5. Install the 4G WWAN card or 5G WWAN card, as applicable.
6. Install the base cover.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Fingerprint reader (Optional)

Removing the fingerprint reader (Optional)

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in Before working inside your computer.

About this task

The following image(s) indicate the location of the fingerprint reader and provides a visual representation of the removal procedure.

Steps

1. Lift the latch and disconnect the fingerprint-reader cable from the connector on the USH board.
2. Move the fingerprint-reader cable away from the fingerprint reader so that the cable is not covering the fingerpr
3. Remove the screw (M2x3) that secures the fingerprint-reader bracket to the palm-rest assembly.
4. Slide and remove the fingerprint-reader bracket from the palm-rest assembly.
5. Lift the fingerprint reader, along with its cable, off the palm-rest assembly.

Installing the fingerprint reader (Optional)

About this task

The following images indicate the location of the fingerprint reader and provide a visual representation of the installation procedure.

Steps

1. Align and place the fingerprint reader on its slot on the palm-rest assembly.

2. Slide the fingerprint-reader bracket on its slot on the palm-rest assembly.

3. Replace the screw (M2x3) that secures the fingerprint reader to the palm-rest assembly.

4. Connect the fingerprint-reader cable to the connector on the USH board and close the latch.

Next steps

1. Install the   assembly-inner   frame.

Smart-card reader

Removing the smart-card reader

CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

1. Follow the procedure in   Before working inside your   computer.
2. Remove the   SIM card.
3. Remove the   base cover.
4. Remove the battery.
5. Remove the   assembly-inner   frame.

About this task

The following image(s) indicate the location of the smart-card reader and provides a visual representation of the removal procedure.

Steps

1. Lift the latch and disconnect the smart-card reader cable from the connector on the USH board.

2. Remove the two screws (M2x2) that secure the smart-card reader to the palm-rest assembly.

3. Lift the smart-card reader, along with its cable, off the palm-rest assembly.

About this task

The following images indicate the location of the smart card reader and provide a visual representation of the installation procedure.

Steps

1. Align and place the smart-card reader on its slot on the palm-rest assembly.
2. Replace the two screws (M2x2) that adheres the smart-card reader to the palm-rest assembly.
3. Connect the smart-card cable to the connector on the USH board and close the latch.

Next steps

1. Install the assembly inner frame.
2. Install the battery.
3. Install the base cover.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

Dummy SIM-card slot filler

Removing the dummy SIM-card slot filler

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.

10. Remove the   assembly-inner   frame.
11. Remove the   system   board.

> NOTE: The system board can be removed with the heat sink attached in order to simplify the procedure and pr
> the thermal bond between the system board and heat sink.

12. Remove the   display   assembly.
13. Remove the   smart-card   reader.
14. Remove the   fingerprint   reader, if applicable.

About this task

> NOTE: For models shipped with WLAN card only, the dummy SIM-card slot filler is a separate service part and is n
> included with replacement palm rest. As a result, the dummy SIM-card slot filler must be removed and then reinstalle
> replacing the palm-rest assembly.

The following image indicates the dummy SIM-card slot filler and provides a visual representation of the dummy SIM-card
filler removal procedure.

Steps

1. Using a scribe, push the dummy SIM-card slot filler from the top side of the palm-rest assembly.
2. Gently lift the dummy SIM-card slot filler out of the palm-rest assembly.

Installing the dummy SIM-card slot filler

Prerequisites

If you are replacing a component, remove the necessary component before the installation procedure.

About this task

The following image indicates the location of the dummy SIM-card slot filler and provides a visual representation of the i

Steps

1. Place the dummy SIM-card slot filler into its compartment on the palm rest.

NOTE: Ensure that the dummy SIM-card slot filler is aligned with the ribs on the palm-rest assembly.

2. Press the dummy SIM-card slot filler until it clicks into place and ensure it fits securely into the SIM card slot.

Next steps

1. Install the fingerprint reader, if applicable.
2. Install the smart card reader.
3. Install the display assembly.
4. Install the system board.
5. Install the assembly inner frame.
6. Install the battery.
7. Install the heat sink.
8. Install the M.2 2230 solid-state drive in Slot 2, if applicable.
9. Install the M.2 2230 or M.2 2280 solid-state drive in Slot 1, as applicable.
10. Install the memory modules.
11. Install the WLAN card.
12. Install the 4G WWAN card or 5G WWAN card, as applicable.
13. Install the base cover.
14. Install the SIM card.
15. Follow the procedure in After working inside your computer.

Palm-rest assembly

2. Remove the SIM card.

3. Remove the base cover.

4. Remove the 4G WWAN card or 5G WWAN card, as applicable.

5. Remove the WLAN card.

6. Remove the memory modules.

7. Remove the M.2 2230 or M.2 2280 solid-state drive from Slot 1, as applicable.

8. Remove the M.2 2230 solid-state drive from Slot 2, if applicable.

9. Remove the battery.

10. Remove the assembly-inner frame.

11. Remove the system board.

> NOTE: The system board can be removed with the heat sink attached in order to simplify the procedure and pr
> the thermal bond between the system board and heat sink.

12. Remove the display assembly.

13. Remove the smart-card reader, if applicable.

14. Remove the fingerprint reader, if applicable.

About this task

> NOTE: When replacing the palmrest assembly, transfer the dummy SIM filler to the new palmrest assembly.

The following images indicate the location of the palm-rest assembly and provide a visual representation of the removal
procedure.

Steps

After performing the steps in the pre-requisites, we are left with the palm-rest assembly.

Installing the palm-rest assembly

> CAUTION: The information in this section is intended for authorized service technicians only.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following images indicate the location of the palm-rest assembly and provide a visual representation of the installation procedure.

Steps

Place the palm-rest assembly on a flat surface.

Next steps

1. Install the fingerprint reader, if applicable.
2. Install the smart card reader, if applicable.
3. Install the display assembly.
4. Install the system board.
5. Install the assembly inner frame.
6. Install the battery.
7. Install the heat sink.
8. Install the M.2 2230 solid-state drive in Slot 2, if applicable.
9. Install the M.2 2230 or M.2 2280 solid-state drive in Slot 1, as applicable.
10. Install the memory modules.
11. Install the WLAN card.
12. Install the 4G WWAN card or 5G WWAN card, as applicable.
13. Install the base cover.
14. Install the SIM card.
15. Follow the procedure in After working inside your computer.

This chapter details the supported operating systems along with instructions on how to install the drivers.

Operating system

Your Latitude 5540 supports the following operating systems:

● Windows 11 Home, 64-bit
● Windows 11 Pro, 64-bit
● Windows 11 Pro downgrade (Win 10 Pro image FI + Win 11 Pro DPK)
● Ubuntu 22.04 LTS, 64-bit

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Base article,
Drivers and Downloads FAQs 000123347.

BIOS

> CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup. Certain changes can make your computer work incorrectly.

> NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not be displa

> NOTE: Before you change the settings in BIOS Setup, it is recommended that you note down the original settings for future reference.

Use BIOS Setup for the following purposes:
- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Entering BIOS setup program

About this task

Turn on (or restart) your computer and press F2 immediately.

Navigation keys

> NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you re the system.

Table 36. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicab
Tab	Moves to the next focus area. NOTE: For the standard graphics browser o
Esc	Moves to the previous page until you view the ma Pressing Esc in the main screen displays a message prompts you to save any unsaved changes and r system.

F12 One Time Boot menu

The F12 One Time Boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

● Removable Drive (if available)
● STXXXX Drive (if available)

> NOTE: XXX denotes the SATA drive number.

● Optical Drive (if available)
● SATA Hard Drive (if available)
● Diagnostics

The boot sequence screen also displays the option to access System Setup.

System setup options

> NOTE: Depending on your computer and its installed devices, the items listed in this section may or may not appea

Table 37. System setup options—System information menu

Overview

Latitude 5540

BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the express service code of the computer.
Ownership Tag	Displays the Ownership Tag of the computer.
Signed Firmware Update	Displays whether the Signed Firmware Update is enabled on you

Battery Information

Primary	Displays that battery is primary.
Battery Level	Displays the battery level of the computer.
Battery State	Displays the battery state of the computer.
Health	Displays the battery health of the computer.
AC Adapter	Displays whether the AC adapter is connected or not.
Battery Life Type	Displays the battery life type options such as Standard, Long Life Long Life Cycle 2.0

Processor Information

Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.

Overview

64-Bit Technology	Displays whether 64-bit technology is used.
Memory Information	
Memory Installed	Displays the total computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology used for the memory.
DIMM_SLOT B	Displays the DIMM B memory size.
DIMM_SLOT A	Displays the DIMM A memory size.
Devices Information	
Panel Type	Displays the Panel Type of the computer.
Video Controller	Displays the video controller type of the computer.
Video Memory	Displays the video memory information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Native Resolution	Displays the native resolution of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Audio Controller	Displays the audio controller information of the computer.
Bluetooth Device	Displays the Bluetooth device information of the computer.
LOM MAC Address	Displays the LAN On Motherboard (LOM) MAC address of the co
Pass Through MAC Address	Displays the pass through MAC address of the computer.
Cellular Device	Displays the M.2 PCIe SSD information of the computer.
dGPU Video Controller	Displays the name of the discrete video controller.

Table 38. System setup options—Boot Configuration menu

Boot Configuration

Boot Sequence	
Boot Mode: UEFI only	Displays the boot mode of this computer.
Boot Sequence	Enables to set the boot order.
Enable Secure Digital (SD) Card Boot	Enable or disable the SD card read-only boot.
	Default: Disabled
Secure Boot	
Enable Secure Boot	Enables secure boot using only validated boot software.
	Default: ON
Enable Microsoft UEFI CA	Enables Microsoft UEFI CA.

Boot Configuration

	Default: OFF
Custom Mode Key Management	Allows for selection of key database.

Table 39. System setup options—Integrated Devices menu

Integrated Devices

Date/Time	Displays the current date in MM/DD/YYYY format and curren HH:MM:SS AM/PM format.
Camera	Enables or disable the camera.
	By default, the Enable Camera option is selected
Audio	
Enable Audio	Enable or disable the integrated audio controller.
	By default, all the options are enabled.
Enable Microphone	Enables or disables microphone.
	By default, Enable Microphone is selected.
Enable Internal Speaker	Enables or disables internal speaker.
	By default, Enable Internal Speaker is selected.
USB/Thunderbolt Configuration	● Enable or disable booting from USB mass storage devices external USB ports.
	By default, the Enable External USB Ports option is enab
	● Enable or disable booting from USB mass storage devices suc hard drive, optical drive, and USB drive.
	By default, the Enable USB Boot Support option is enable
Enable Thunderbolt Technology Support	Enable or disable the associated ports and adapters.
	By default, the Enable Thunderbolt Technology Support optic
Enable Thunderbolt Boot Support	Enable or disable the Thunderbolt adapter peripheral device and connected to the Thunderbolt adapter to be used during BIOS Pr
	By default, the Enable Thunderbolt Boot Support option is dis
Enable Thunderbolt (and PCIe behind TBT) pre-boot modules	Enable or disable the PCIe devices that are connected through a adapter to execute the PCIe devices UEFI Option ROM (if presen pre-boot.
	By default, the Enable Thunderbolt (and PCIe behind TB modules option is disabled.
Disable USB4 PCIE Tunneling	Disable the USB4 PCIE Tunneling option.
	By default, the option is disabled.
Video/Power only on Type-C Ports	Enable or disable the Type-C port functionality to video or only po

Table 39. System setup options—Integrated Devices menu (continued)

Integrated Devices

	By default, the Video option is disabled.
Audio	Enable or disable the usage of audio on Dell Dock external ports.
	By default, the Audio option is enabled.
Lan	Enable or disable the usage of LAN on Dell Dock external ports.
	By default, the Lan option is enabled.
Miscellaneous Devices	Enable or disable Fingerprint Reader device.
	By default, the Enable Fingerprint Reader Device option is er
Unobtrusive Mode	
Enable Unobtrusive Mode	Enable or disable all the computer light and sound.
	By default, the Enable Unobtrusive Mode option is not enable

Table 40. System setup options—Storage menu

Storage

SATA Operation	
SATA Operation	Set the operating mode of the integrated storage device cont the RAID On option is enabled.
Storage Interface	
SATA Operation	Enable or disable the onboard drives on the computer. The follow available (ON by default): ● M.2 PCIe SSD-1 ● M.2 PCIe SSD-2
SMART Reporting	
Enable SMART Reporting	Enable or disable Self-Monitoring, Analysis, and Reporting Te (SMART) during computer startup.
	By default, the Enable SMART Reporting option is not enable
Drive Information	Displays the drive type and device name.
Enable MediaCard	
Secure Digital (SD) Card	Enable or disable the SD card.
	By default, the Secure Digital (SD) Card option is enabled.
Secure Digital (SD) Card Read-Only Mode	Enable or disable the SD card read-only mode.
	By default, the Secure Digital (SD) Card Read-Only Mode op enabled.

Table 41. System setup options—Display menu

Display

Table 41. System setup options—Display menu (continued)

Display	
Touchscreen	Enable or disable the touchscreen for the operating system.
	By default, the option is enabled.

Table 42. System setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	Controls the on-board LAN controller.
	By default, the Enabled with PXE option is enabled.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack.
	By default, the Enable UEFI Network Stack and Enabled w/F enabled.
Wireless Device Enable	
WWAN/GPS	Enable or disable the internal WWAN/GPS device
	By default, the option is enabled.
WLAN	Enable or disable the internal WLAN device
	By default, the option is enabled.
Bluetooth	Enable or disable the internal Bluetooth device
	By default, the option is enabled.
Contactless smartcard/NFC	Enable or disable the internal Contactless smartcard/NFC de
	By default, the option is enabled.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack and controls the on-board Controller.
	By default, the Enable UEFI Network Stack option are enable
Wireless Radio Control	
Control WLAN radio	Sense the connection of the computer to a wired network and su disable the selected wireless radios (WLAN).
	By default, the option is disabled.
Control WWAN radio	Sense the connection of the computer to a wired network and su disable the selected wireless radios (WWAN).
	By default, the option is disabled.
HTTPs Boot Feature	
HTTPs Boot	Enable or disable the HTTPs Boot feature.
	By default, the HTTPs Boot option is enabled.
HTTPs Boot Mode	With Auto Mode, the HTTPs Boot extracts Boot URL from the DH Manual Mode, the HTTPs Boot reads Boot URL from the user-pr

Table 43. System setup options—Power menu

Power

Battery configuration	Enables the computer to run on battery during peak power usage the table Custom Charge Start and Custom Charge Stop, to power usage between certain times of each day.
	By default, the Adaptive option is enabled.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enable or disable the advanced battery charge configuration.
	By default, the Enable Advanced Battery Charge Configu disabled.
Peak Shift	Enables the computer to run on battery during peak power usage
	By default, the Enable Peak Shift option is enabled.
Enable Peak Shift	
Type-C Connector Power	Enables you to select the applicable wattage.
USB PowerShare	
Enable USB PowerShare	Enable or disable the USB PowerShare.
	By default, the Enable USB PowerShare option is disabled
Thermal Management	Enables to cool the fan and processor heat management to adjus computer performance, noise, and temperature.
	By default, the Optimized option is enabled.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock will wake the com standby.
	By default, the Wake on Dell USB-C Dock option is enabled.
Block Sleep	Enables to block entering sleep (S3) mode in the operating system
	By default, the Block Sleep option is disabled.
Lid Switch	Enable or disable the lid switch.
	By default, the Lid Switch option is enabled.
Intel Speed Shift Technology	Enable or disable the Intel speed shift technology support.
	By default, the Intel Speed Shift Technology option is enabled

Table 44. System setup options—Security menu

Security

TPM 2.0 Security	
TPM 2.0 Security On	Enable or disable TPM 2.0 security options.
	By default, the TPM 2.0 Security On option is enabled.
Attestation Enable	Enables to control whether the Trusted Platform Module (TPI Hierarchy is available to the operating system

Security	
SHA-256	BIOS and the TPM will use the SHA-256 hash algorithm to exten measurements into the TPM PCRs during BIOS boot.
	By default, the SHA-256 option is enabled.
Clear	Enables to clear the TPM owner information and returns the TPM default state.
	By default, the Clear option is disabled.
PPI ByPass for Clear Commands	Controls the TPM Physical Presence Interface (PPI).
	By default, the PPI ByPass for clear Commands option is dis
Intel Total Memory Encryption	
Total Memory Encryption	Enable or disable you to protect memory from physical attacks in spray, probing DDR to read the cycles, and others.
	By default, the Total Memory Encryption option is disabled.
Chassis intrusion	Controls the chassis intrusion feature.
	By default, the On-Silent option is enabled.
SMM Security Mitigation	Enable or disable SMM Security Mitigation.
	By default, the option is enabled.
Data Wipe on Next Boot	
Start Data Wipe	Enable or disable the data wipe on next boot.
	By default, the option is enabled.
Absolute	Enable or disable or permanently disable the BIOS module interfa optional Absolute Persistence Module service from Absolute
	By default, the option is enabled.
UEFI Boot Path Security	Controls whether or not the computer will prompt the user to ente password (if set) when booting to a UEFI boot device from the F1
	By default, the Always Except Internal HDD option is enabled
Authenticated BIOS Interface	
Enable Authenticated BIOS Interface	By default, this option is disabled.
Clear Certificate Store	By default, this option is disabled.
Firmware Device Tamper Detection	Enables you to control the firmware device tamper detection feature notifies the user when the firmware device is tampered. W a screen warning messages are displayed on the computer and a detection event is logged in the BIOS Events log. The computer f until the event is cleared.
	By default, the Firmware Device Tamper Detection option is s
	For additional security, Dell Technologies recommends keepi Device Tamper Detection option enabled.

Passwords	
M.2 PCIe SSD-1	Set, change, or delete the SSD-1 password.
M.2 PCIe SSD-2	Set, change, or delete the SSD-2 password.
Password Configuration	
Upper Case Letter	Reinforces password must have at least one upper case letter.
	By default, the option is disabled.
Lower Case Letter	Reinforces password must have at least one lower case letter.
	By default, the option is disabled.
Digit	Reinforces password must have at least one digit.
	By default, the option is disabled.
Special Character	Reinforces password must have at least one special character.
	By default, the option is disabled.
Minimum Characters	Set the minimum characters allowed for password.
Password Bypass	When enabled, this always prompts for computer and internal har passwords when powered on from the off state.
	By default, the Disabled option is enabled.
Password Changes	
Enable Non-Admin Password Changes	Enable or disable to change computer and hard drive password w need for admin password.
	By default, the option is enabled.
Admin Setup Lockout	
Enable Admin Setup Lockout	Enables administrators control over how their users can or canno setup.
	By default, the option is disabled.
Master Password Lockout	
Enable Master Password Lockout	When enabled, this will disable the master password support.
	By default, the option is disabled.
Allow Non-Admin PSID Revert	
Enable Allow Non-Admin PSID Revert	Controls access to the Physical Security ID (PSID) revert of N from the Dell Security Manager prompt.
	By default, the option is disabled.

Table 46. System setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update pa
	By default, the option is enabled.

Table 46. System setup options—Update, Recovery menu (continued)

Update, Recovery

Allow BIOS Downgrade	Enable or disable the flashing of the computer firmware to previou~~~ blocked.
	By default, the option is enabled.
SupportAssist OS Recovery	Enable or disable the boot flow for SupportAssist OS Recovery to~~ event of certain computer errors.
	By default, the option is enabled.
BISOConnect	Enable or disable cloud Service OS recovery if the main operating~~ to boot with the number of failures equal to or greater than the va~~ by the Auto OS Recovery Threshold setup option and local Servi~~ boot or is not installed.
	By default, the option is enabled.
Dell Auto OS Recovery Threshold	Controls the automatic boot flow for SupportAssist System R~~ and for Dell OS Recovery Tool.
	By default, the threshold value is set to 2.

Table 47. System setup options—System Management menu

System Management

Service Tag	Display the Service Tag of the computer.
Asset Tag	Create a computer Asset Tag.
AC Behavior	
Wake on AC	Enable or disable the wake on AC option.
	By default, the option is disabled.
Wake on LAN	
Wake on LAN	Enable or disable the computer to power on by special LAN signa~~ receives a wakeup signal from the WLAN.
	By default, the Disabled option is selected.
Auto on Time	Enable to set the computer to turn on automatically every day or ~~ preselected date and time. This option can be configured only if th~~ Time is set to Everyday, Weekdays, or Selected Days.
	By default, the option is disabled.
Intel AMT Capability	
Enable Intel AMT Capability	Enable or disable Intel AMT capability.
	By default, this option is set to Restrict Preboot Access.
First Power On Date	
Set Ownership Date	Enables to set the ownership date.
	By default, this option is disabled.
Diagnostics	

Table 48. System setup options—Keyboard menu

Keyboard

Numlock Enable	Enable or disable the Numlock function when the computer boots
	By default, the option is enabled.
Fn Lock Options	By default, the Fn lock option is enabled.
Keyboard Illumination	Enables to change the keyboard illumination settings.
	By default, the Bright option is enabled.
Keyboard Backlight Timeout on AC	Set the timeout value for the keyboard backlight when an AC ada connected to the computer.
	By default, the 10 seconds option is enabled.
Keyboard Backlight Timeout on Battery	Set the timeout value for the keyboard backlight when the is runn battery power.
	By default, the 10 seconds option is enabled.
Device Configuration Hotkey Access	Manages whether you can access device configuration scree hotkeys during computer startup.
	By default, the option is enabled.

Table 49. System setup options—Pre-boot Behavior menu

Pre-boot Behavior

Adapter Warnings	
Enable Adapter Warnings	Enable or disable the warning messages during boot when the ac less power capacity are detected.
	By default, the option is enabled.
Warning and Errors	Enable or disable the action to be done when a warning or error is
	By default, the Prompt on Warnings and Errors option is enab
Fastboot	Enable to set the speed of the boot process.
	By default, the Minimal option is enabled.
Extend BIOS POST Time	Set the BIOS POST time.
	By default, the 0 seconds option is enabled.
MAC Address Pass-Through	Replaces the external NIC MAC address with the selected MAC a the computer.
	By default, the System Unique MAC Address option is enable
Sign of Life	
Early Keyboard Backlight	By default, the option is enabled.

Table 50. System setup options—Virtualization menu

Virtualization

Intel Virtualization Technology

Table 50. System setup options—Virtualization menu (continued)

Virtualization	
	Default: ON
DMA Protection	
Enable Pre-Boot DMA Support	This setting controls Pre-boot DMA protection for both interna ports.
	Default: ON
Enable OS Kernel DMA Support	This setting controls Kernel DMA protection for both internal ports.
	Default: ON

Table 51. System setup options—Performance menu

Performance	
Multi Core Support	
Active Cores	Enables to change the number of CPU cores available to the ope
	By default, the All Cores options is enabled.
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the computer to dynamically adjust processor voltage an frequency, decreasing average power consumption and heat
	By default, the option is enabled.
C-States Control	
Enable C-State Control	Enable or disable additional processor sleep states.
	By default, the option is enabled.
Intel TurbocBoost Technology	
Enable Intel Turbo Boost Technology	Enable or disable Intel TurboBoost mode of the processor.
	By default, the option is enabled.
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	Enable or disable Hyper-Threading in the processor.
	By default, the option is enabled.

Table 52. System setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear Bios Event Log	Display BIOS events.
	By default, the Keep option is enabled.
Thermal Event Log	
Clear Thermal Event Log	Display Thermal events.

Updating the BIOS

Updating the BIOS in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the com
will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress a
system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an
unnecessary operating system re-install. For more information on this subject, search in the Knowledg
Resource at www.dell.com/support.

Steps

1. Go to www.dell.com/support.
2. Click Product support. In the Search support box, enter the Service Tag of your computer, and then click Searc
    NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your compute
    can also use the product ID or manually browse for your computer model.

3. Click Drivers & Downloads. Expand Find drivers.
4. Select the operating system installed on your computer.
5. In the Category drop-down list, select BIOS.
6. Select the latest version of BIOS, and click Download to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
    For more information, search in the Knowledge Base Resource at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article
www.dell.com/support.

Updating the BIOS using the USB drive in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the syst
will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress a
system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an
unnecessary operating system re-install. For more information on this subject, search in the Knowledg
Resource at www.dell.com/support.

Steps

1. Follow the procedure from step 1 to step 6 in   Updating the BIOS in Windows   to download the latest BIOS
2. Create a bootable USB drive. For more information, search in the Knowledge Base Resource at www.dell.com/

Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the com will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress a computer will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledg Resource at www.dell.com/support.

BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F1 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, th BIOS supports this BIOS update option.

NOTE: Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

● USB drive formatted to the FAT32 file system (key does not have to be bootable)
● BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
● AC power adapter that is connected to the computer
● Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boo off your computer.

Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arro then press Enter.
   The flash BIOS menu is displayed.
3. Click Flash from file.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click Submit.
6. Click Update BIOS. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

System and setup password

Table 53. System and setup password

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data that is stored on your computer if it is not locked and left una

NOTE: System and setup password feature is disabled.

Assigning a System Setup password

Prerequisites

You can assign a new System or Admin Password only when the status is in Not Set.

About this task

To enter BIOS System Setup, press F2 immediately after a power-on or reboot.

Steps

1. In the System BIOS or System Setup screen, select Security and press Enter.
   The Security screen is visible.
2. Select System/Admin Password and create a password in the Enter the new password field.

   Use the following guidelines to assign the system password:
   ● A password can have up to 32 characters.
   ● At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   ● Numbers 0 through 9.
   ● Upper case letters from A to Z.
   ● Lower case letters from a to z.

3. Type the system password that you entered earlier in the Confirm new password field and click OK.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

Prerequisites

Ensure that the Password Status is Unlocked (in the System Setup) before attempting to delete or change the exi
System and/or Setup password. You cannot delete or change an existing System or Setup password, if the Passw
Locked.

About this task

To enter the System Setup, press F12 immediately after a power-on or reboot.

Steps

1. In the System BIOS or System Setup screen, select System Security and press Enter.
   The System Security screen is displayed.
2. In the System Security screen, verify that Password Status is Unlocked.
3. Select System Password, update, or delete the existing system password, and press Enter or Tab.

Clearing CMOS settings

About this task

CAUTION: Clearing CMOS settings will reset the BIOS settings on your computer.

Steps

1. Remove the base cover.
2. Disconnect the battery cable from the system board.
3. Remove the coin-cell battery.
4. Wait for one minute.
5. Replace the coin-cell battery.
6. Connect the battery cable to the system board.
7. Replace the base cover.

Clearing BIOS (System Setup) and System pa

About this task

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation acco Windows or your application.

Handling swollen rechargeable Li-ion batteries

Like most laptops, Dell laptops use Lithium-ion batteries. One type of Lithium-ion battery is the rechargeable Li-ion battery. Rechargeable Li-ion batteries have increased in popularity in recent years and have become standard in the electronics ind due to customer preferences for a slim form factor (especially with newer ultra-thin laptops) and long battery life. Inherent t rechargeable Li-ion battery technology is the potential for swelling of the battery cells.

Swollen battery may impact the performance of the laptop. To prevent possible further damage to the device enclosure or internal components leading to malfunction, discontinue the use of the laptop and discharge it by disconnecting the AC ada and letting the battery drain.

Swollen batteries should not be used and should be replaced and disposed of properly. We recommend contacting Dell pro support for options to replace a swollen battery under the terms of the applicable warranty or service contract, including op for replacement by a Dell authorized service technician.

The guidelines for handling and replacing rechargeable Li-ion batteries are as follows:

● Exercise caution when handling rechargeable Li-ion batteries.
● Discharge the battery before removing it from the system. To discharge the battery, unplug the AC adapter from the syste and operate the system only on battery power. When the system will no longer power on when the power button is pres the battery is fully discharged.
● Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
● Do not expose the battery to high temperatures, or disassemble battery packs and cells.
● Do not apply pressure to the surface of the battery.
● Do not bend the battery.
● Do not use tools of any type to pry on or against the battery.
● If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a battery can be dangerous.
● Do not attempt to reassemble a damaged or swollen battery into a laptop.
● Swollen batteries that are covered under warranty should be returned to Dell in an approved shipping container (provided by Dell)—this is to comply with transportation regulations. Swollen batteries that are not covered under warranty shoul disposed of at an approved recycling center. Contact Dell product support at https://www.dell.com/suppo and further instructions.
● Using a non-Dell or incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell that is designed to work with your Dell computer. Do not use a battery from oth computers with your computer. Always purchase genuine batteries from https://www.dell.com or otherwis Dell.

Rechargeable Li-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high hea For more information on how to improve the performance and lifespan of the laptop battery and to minimize the possibility occurrence of the issue, search Dell Laptop Battery in the Knowledge Base Resource at www.dell.com/support.

Locate the Service Tag or Express Service Code of your Dell computer

Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for Dell computer, we recommend entering the Service Tag or Express Service Code at www.dell.com/support.

For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing yo

● Run tests automatically or in an interactive mode

● Repeat tests

● Display or save test results

● Run thorough tests to introduce additional test options to provide extra information about the failed device(s)

● View status messages that inform you if tests are completed successfully

● View error messages that inform you of problems encountered during testing

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the compute terminal when the diagnostic tests are performed.

For more information, see the knowledge base article 000180971.

Running the SupportAssist Pre-Boot System Performa

Steps

1. Turn on your computer.

2. As the computer boots, press the F12 key as the Dell logo appears.

3. On the boot menu screen, select the Diagnostics option.

4. Click the arrow at the bottom left corner.
   Diagnostics front page is displayed.

5. Click the arrow in the lower-right corner to go to the page listing.
   The items detected are listed.

6. To run a diagnostic test on a specific device, press Esc and click Yes to stop the diagnostic test.

7. Select the device from the left pane and click Run Tests.

8. If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

Built-in self-test (BIST)

M-BIST

M-BIST (Built In Self-Test) is the system board's built-in self-test diagnostics tool that improves the diagnostics ac system board embedded controller (EC) failures.

NOTE: M-BIST can be manually initiated before POST (Power On Self Test).

How to run M-BIST

Table 54. LED error codes

Blinking Pattern		Possible Problem
Amber	White	
2	1	CPU Failure
2	8	LCD Power Rail Fa...
1	1	TPM Detection Fa...
2	4	Memory/RAM fai...

4. If there is no failure with the system board, the LCD will cycle through the solid color screens described in the LCD-BIS... section for 30 seconds and then power off.

LCD Power rail test (L-BIST)

L-BIST is an enhancement to the single LED error code diagnostics and is automatically initiated during POST. L-BIST wi... the LCD power rail. If there is no power being supplied to the LCD (that is if the L-BIST circuit fails), the battery status LED... flash either an error code [2,8] or an error code [2,7].

> NOTE: If L-BIST fails, LCD-BIST cannot function as no power will be supplied to the LCD.

How to invoke L-BIST Test:

1. Press the power button to start the system.
2. If the system does not start up normally, look at the battery status LED:
   ● If the battery status LED flashes an error code [2,7], the display cable may not be connected properly.
   ● If the battery status LED flashes an error code [2,8], there is a failure on the LCD power rail of the system board, he... there is no power supplied to the LCD.
3. For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
4. For cases when a [2,8] error code is shown, replace the system board.

LCD Built-in Self Test (BIST)

Dell laptops have a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an i... problem with the LCD (screen) of the Dell laptop or with the video card (GPU) and PC settings.

When you notice screen abnormalities like flickering, distortion, clarity issues, fuzzy or blurry image, horizontal or vertical... color fade etc., it is always a good practice to isolate the LCD (screen) by running the Built-In Self Test (BIST).

How to invoke LCD BIST Test

1. Power off the Dell laptop.
2. Disconnect any peripherals that are connected to the laptop. Connect only the AC adapter (charger) to the lapto...
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold D key and Power on the laptop to enter LCD built-in self test (BIST) mode. Continue to hold the D key, ... the system boots up.
5. The screen will display solid colors and change colors on the entire screen to white, black, red, green, and blue twice.
6. Then it will display the colors white, black and red.

System-diagnostic lights

Power and battery-status light

The power and battery-status light indicates the power and battery status of the computer. These are the power s

Solid white:Power adapter is connected and the battery has more than 5% charge.

Amber:Computer is running on battery and the battery has less than 5% charge.

Off:
● Power adapter is connected, and the battery is fully charged.
● Computer is running on battery, and the battery has more than 5% charge.
● Computer is in sleep state, hibernation, or turned off.

The power and battery-status light may blink amber or white according to pre-defined "beep codes" indicating var

For example, the power and battery-status light blinks amber two times followed by a pause, and then blinks white three t
followed by a pause. This 2,3 pattern continues until the computer is turned off, indicating no memory or RAM is detected

The following table shows different power and battery-status light patterns and associated problems.

> NOTE: The following diagnostic light codes and recommended solutions are intended for Dell service technicians t
> troubleshoot problems. You should only perform troubleshooting and repairs as authorized or directed by the Dell te
> assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Table 55. Diagnostic-light LED codes

Diagnostic light codes (Amber,White)	Problem description
1,1	TPM detection failure
1,2	Unrecoverable SPI Flash Failure
1,3	Short in hinge cable tripped OCP1
1,4	Short in hinge cable tripped OCP2
1,5	EC unable to program i-Fuse
1,6	Generic catch-all for ungraceful EC code flow errors
1,7	Non-RPMC flash on boot guard fused system
2,1	Processor failure
2,2	System board: BIOS or Read-Only Memory (ROM) failure
2,3	No memory or Random-Access Memory (RAM) detected
2,4	Memory or Random-Access Memory (RAM) failure
2,5	Invalid memory installed
2,6	System-board or chipset error
2,7	Display failure - SBIOS message
3,1	Coin-cell battery failure

Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into the primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see Dell SupportAssist OS Recovery User's Guide at www.dell.com/serviceabilitytools. Click SupportAssist and then, click SupportAssist OS Recovery.

Real-Time Clock (RTC Reset)

The Real Time Clock (RTC) reset function allows you or the service technician to recover Dell systems from No POST/No Power/No Boot situations. The legacy jumper enabled RTC reset has been retired on these models.

Start the RTC reset with the system powered off and connected to AC power. Press and hold the power button for

thirty (30) seconds

. The system RTC Reset occurs after you release the power button.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information. see Dell Media and Recovery Options.

Wi-Fi power cycle

About this task

If your computer is unable to access the Internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps
1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

For your safety, and to protect the sensitive electronic components in your computer, you are requested to drain residual f
power before removing or replacing any components in your computer.

Draining residual flea power, also known as a performing a "hard reset", is also a common troubleshooting step if your co
does not power on or boot into the operating system.

To drain residual flea power (perform a hard reset)

Steps

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Remove the base cover.
4. Remove the battery.
5. Press and hold the power button for 20 seconds to drain the flea power.
6. Install the battery.
7. Install the base cover.
8. Connect the power adapter to your computer.
9. Turn on your computer.

> NOTE: For more information about performing a hard reset, search in the Knowledge Base Resource at
> support.

Getting help and contacting

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 56. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
Tips	
Contact Support	In Windows search, type Contact Support, an Enter.
Online help for operating system	www.dell.com/support/windows
	www.dell.com/support/linux
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Ser Express Service Code. To view relevant support your Dell computer, enter the Service Tag or Expr Code at www.dell.com/support. For more information on how to find the Service T computer, see Locate the Service Tag on your
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support pag Support > Knowledge Base. 3. In the Search field on the Knowledge Base pag keyword, topic, or model number, and then cl search icon to view the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country/region and product, and some services may not be available in your country/reg

NOTE: If you do not have an active Internet connection, you can find contact information about your purchase invoic packing slip, bill, or Dell product catalog.