Dell Precision 3431 Small Form Factor

Setup and specifications guide

Regulatory Model: D11S
Regulatory Type: D11S004
December 2020
Rev. A00

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 to avoid the problem.

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

Contents

Chapter 1: Set up your computer **5**

Chapter 2: Chassis overview **8**
- Front view 8
- Back view 9
- Service tag label 9

Chapter 3: System specifications **10**
- System information 10
- Processor 10
- Memory 11
- Storage 12
- Media card-reader 13
- System board connectors 13
- Audio 13
- Video card 14
- Communication 14
- Wireless 14
- Ports and connectors 15
- Power supply 15
- Security 15
- Security Software 16
- Operating system 16
- Physical system dimensions 16
- Environmental 17
- Computer environment 17

Chapter 4: System setup **18**
- System setup 18
- Boot menu 18
- Navigation keys 19
- Boot Sequence 19
- System setup options 19
  - General options 19
  - System information 20
  - Video screen options 21
  - Security 22
  - Secure boot options 23
  - Intel Software Guard Extensions options 24
  - Performance 24
  - Power management 25
  - Post behavior 25
  - Manageability 26
  - Virtualization support 26

Wireless options....27
Maintenance....27
System logs....27
Advanced configuration....28
Updating the BIOS in Windows....28
Updating BIOS on systems with BitLocker enabled....28
Updating your system BIOS using a USB flash drive....28
Updating the Dell BIOS in Linux and Ubuntu environments....29
Flashing the BIOS from the F12 One-Time boot menu....29
System and setup password....34
Assigning a system setup password....35
Deleting or changing an existing system setup password....35

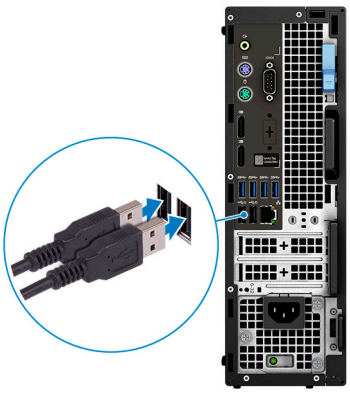
Chapter 5: Software....36
Operating system....36
Downloading Windows drivers....36

Chapter 6: Getting help....37
Contacting Dell....37

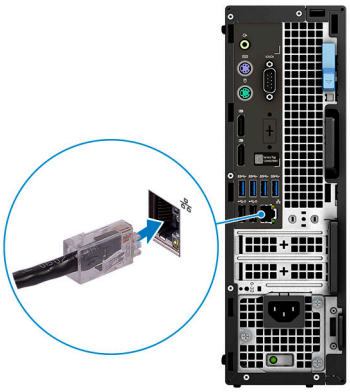
1

Set up your computer

1. Connect the keyboard and mouse.



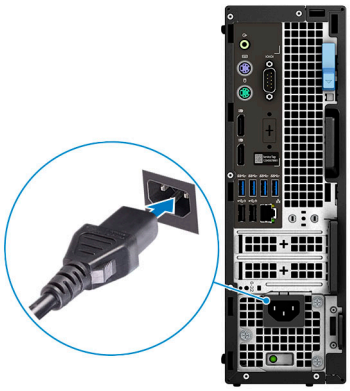
2. Connect to your network using a cable, or connect to a wireless network.



3. Connect the display.

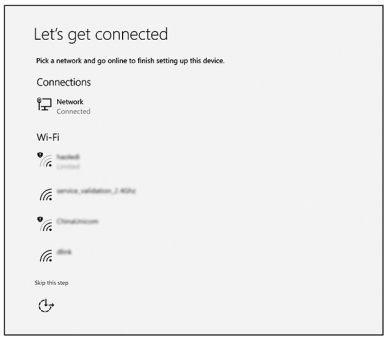
NOTE: If you ordered your computer with a discrete graphics card, the HDMI and the display ports on the back panel of your computer are covered. Connect the display to the discrete graphics card.

4. Connect the power cable.

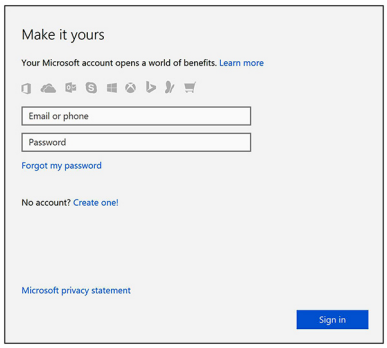


5. Press the power button.

6. Follow the instructions on the screen to finish Windows setup:
   a. Connect to a network.

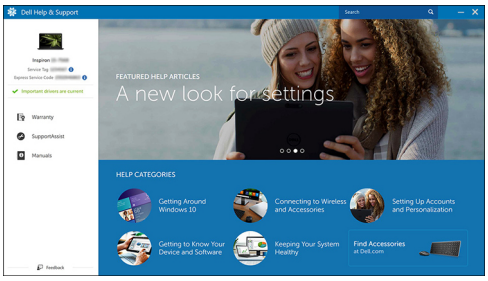


   b. Sign-in to your Microsoft account or create a new account.



7. Locate Dell apps.

Table 1. Locate Dell apps

	Register your computer
	Dell Help & Support 
	SupportAssist — Check and update your computer

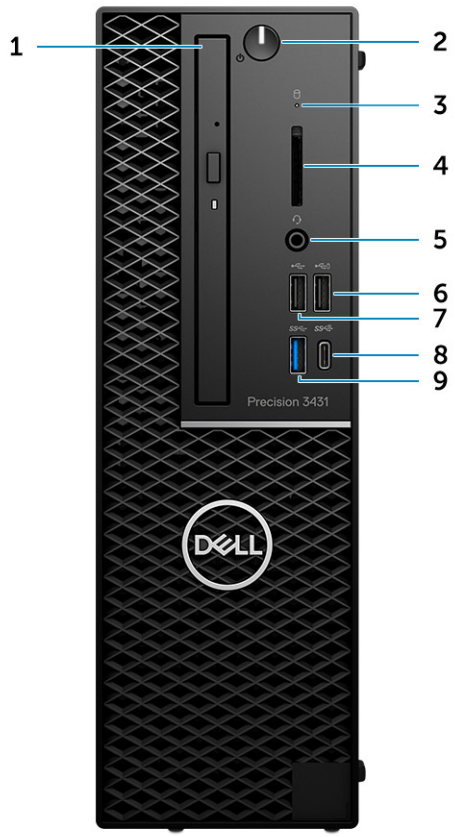
2

Chassis overview

Topics:

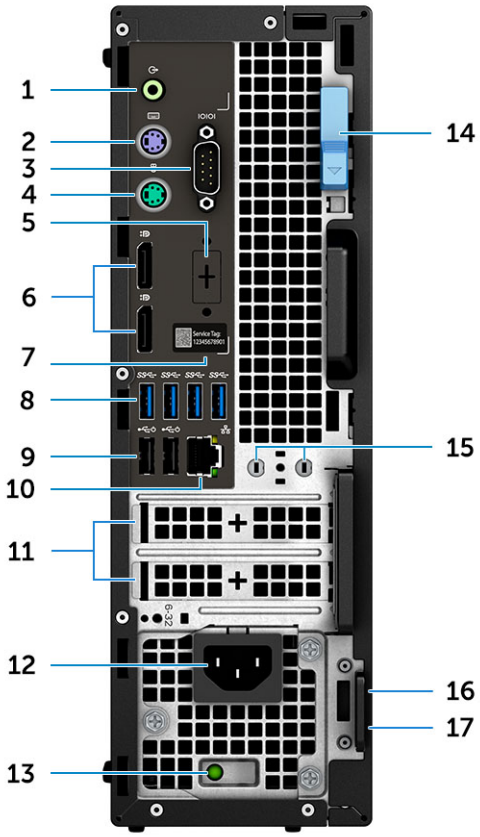
- Front view
- Back view
- Service tag label

Front view



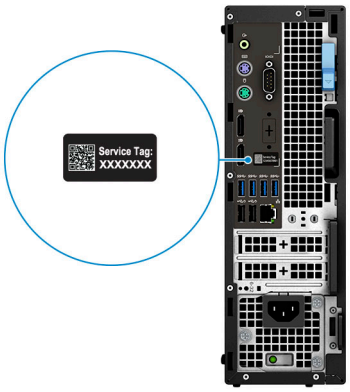
1. Optical drive
2. Power button
3. Drive activity light
4. SD card slot
5. Headset port
6. USB 2.0 port with PowerShare
7. USB 2.0 port
8. USB 3.1 Gen 2 Type-C port with PowerShare
9. USB 3.1 Gen 1 port

Back view



1. Line-out port
2. PS/2 keyboard port
3. Serial port
4. PS/2 mouse port
5. DisplayPort/HDMI 2.0/VGA/USB Type-C Alt-Mode (optional)
6. DisplayPort * 2
7. Service tag label
8. USB 3.1 Gen 1 ports
9. USB 2.0 ports(supports SmartPower On)
10. RJ45 network port
11. Expansion card slots
12. Power cable connector
13. Power supply diagnostic light
14. Release latch
15. External Antenna Connectors(2) (Optional)
16. Kensington security cable slot
17. Padlock ring

Service tag label



3

System specifications

NOTE: Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information about the configuration of your computer, go to **Help and Support** in your Windows operating system and select the option to view information about your computer.

Topics:

- System information
- Processor
- Memory
- Storage
- Media card-reader
- System board connectors
- Audio
- Video card
- Communication
- Wireless
- Ports and connectors
- Power supply
- Security
- Security Software
- Operating system
- Physical system dimensions
- Environmental
- Computer environment

System information

Table 2. System information

Chipset	Intel C246 Chipset
DRAM bus width	64-bit
FLASH EPROM	SPI 128Mbits
PCIe bus	100 Mhz
External bus frequency	DMI 3.0-8GT/s

Processor

NOTE: Processor numbers are not a measure of performance. Processor availability is subject to change and may vary by region/country.

Table 3. 9th Generation Intel Core Processor specifications

Type	UMA Graphics
Intel Core Processor i3 - 9300 (4 Cores/8MB/4T/up to 4.3GHz/65W)	Intel UHD Graphics 630
Intel Core Processor i5 - 9500 (6 Cores/9MB/6T/up to 4.4GHz/65W)	Intel UHD Graphics 630
Intel Core Processor 5 - 9600 (6 Cores/9MB/6T/up to 4.6GHz/95W)	Intel UHD Graphics 630
Intel Core Processor i7 - 9700 (8 Cores/12MB/8T/up to 4.9GHz/95W)	Intel UHD Graphics 630
Intel Core Processor i9 - 9900 (8 Cores/16MB/16T/up to 5.0GHz/95W)	Intel UHD Graphics 630
Intel Pentium Gold G5420 (2 Cores, 4MB Cache, 3.8GHz)	Intel UHD Graphics 630
Intel Xeon E Processor E-2224 (4 Core, 8MB Cache, 3.4GHz, 4.6GHz Turbo)	NA
Intel Xeon E Processor E-2224G (4 Core, 8MB Cache, 3.5GHz, 4.7GHz Turbo)	Intel UHD Graphics 630
Intel Xeon E Processor E-2236 (6 Core, 8MB Cache, 3.4GHz, 4.8GHz Turbo)	NA
Intel Xeon E Processor E-2236G (6 Core, 8MB Cache, 3.6GHz, 4.8GHz Turbo)	Intel UHD Graphics 630

Table 4. 8th Generation Intel Core Processor specifications

Type	UMA Graphics
Intel Xeon E Processor E-2174G (4 Core HT, 8MB Cache, 3.8GHz, 4.7GHz)	Intel UHD Graphics 630
Intel Core Processor i7-8700 (6 Core, 12MB Cache, 3.20GHz, 4.6GHz)	Intel UHD Graphics 630

Memory

Table 5. Memory specifications

Minimum memory configuration	4 GB
Maximum memory configuration	64 GB
Number of slots	4 UDIMM
Maximum memory supported per slot	16 GB
Memory options	• 4 GB - 1 x 4 GB • 8 GB - 1 x 8 GB • 8 GB - 2 x 4 GB • 16 GB - 2 x 8 GB • 16 GB - 4 x 4 GB • 32 GB - 2 x 16 GB

Table 5. Memory specifications (continued)

	• 32 GB - 4 x 8 GB • 64 GB - 4 x 16 GB
Type	ECC/Non-ECC memory
Speed	2666 MHz **NOTE:** Pentium and i3 will run at 2400 MHz

Storage

Table 6. Storage specifications

Type	Form factor	Interface	Security option	Capacity
One NVMe Solid-State Drives(SSD)	M.2 2280	PCIe 4, Up to 32 Gbps	SED	Up to 1 TB
One Solid-State Optane memory drive (SSD)	M.2 2230	PCIe, Up to 32 Gbps		32 GB
Two 2.5 inch Hard-Disk Drive (HDD)	Approximately (2.760 x 3.959 x 0.374 inches)	SATA AHCI, Up to 6 Gbps	SED, Opal, FIPS	Up to 4 TB
One 3.5 inch Hard-Disk Drive (HDD)	Approximately (2.760 x 3.959 x 0.276 inches)	SATA AHCI, Up to 6 Gbps		Up to 4 TB

Table 7. Storage configurations

Primary/Boot drive	Form Factor
1 x M.2 Drive	NA
1 x M.2 Drive	1 x 2.5 inch Drive
1 x 2.5 inch Drive	NA
1 x 2.5 inch HDD	NA
1 x Slim Optical Disk Drive	CAC/PIV - Common Access Card/Personal Identification Verification - CAC/PIV

NOTE: Supports RAID 0 and 1 with dual 2.5 " HDD. It is not available with Optane memory (Available from August 2019).

For optimal performance when configuring drives as a RAID volume, Dell recommends drive models that are identical.

RAID 0 (Striped, Performance) volumes benefit from higher performance when drives are matched because the data is split across multiple drives: any IO operations with block sizes larger than the stripe size will split the IO and become constrained by the slowest of the drives. For RAID 0 IO operations where block sizes are smaller than the stripe size, whichever drive the IO operation targets will determine the performance, which increases variability and results in inconsistent latencies. This variability is particularly pronounced for write operations and it can be problematic for applications that are latency sensitive. One such example of this is any application that performs thousands of random writes per second in very small block sizes.

RAID 1 (Mirrored, Data Protection) volumes benefit from higher performance when drives are matched because the data is mirror across multiple drives: all IO operations must be performed identically to both drives, thus variations in drive performance when the models are different results in the IO operations completing only as fast as the slowest drive. While this does not suffer the variable latency issue in small random IO operations as with RAID 0 across heterogeneous drives, the impact is nonetheless large because the higher performing drive becomes limited in all IO types. One of the worst examples of constrained performance here is when using unbuffered IO. To ensure writes are fully committed to non-volatile regions of the RAID volume, unbuffered IO bypasses cache (for example by using the Force Unit Access bit in the NVMe protocol) and the IO operation will not complete until all the drives in the RAID volume have completed the request to commit the data. This kind of IO operation completely negates any advantage of a higher performing drive in the volume.

Care must be taken to match not only the drive vendor, capacity, and class, but also the specific model. Drives from the same vendor, with the same capacity, and even within the same class, can have very different performance characteristics for certain types of IO operations. Thus, matching by model ensures that the RAID volumes is comprised of an homogeneous array of drives that will deliver all the benefits of a RAID volume without incurring the additional penalties when one or more drives in the volume are lower performing.

When RAID is used for two non-identical drives (i.e. M.2 + 2.5 inch), performance will be at the speed of the slower drive in the array.

Media card-reader

Table 8. Media-card reader specifications

Type	One SD-card slot
Supported cards	• SD • SDHC • SDXC

System board connectors

Table 9. System board connectors

M.2 Connectors	One (2280 and 2230)
Serial ATA (SATA) connector	Three Gen 3 full height slot
PCIe X16 slot	One half height slot
PCIex4 slot (Open ended)	One half height slot

Audio

Table 10. Audio specifications

Controller	Realtek ALC3234
Type	Four-channel high-definition audio
Speakers	Two (Directional speakers)
Interface	• Universal audio jack • High quality speakers • Noise reducing array microphones • Stereo headset/mic combo
Internal speaker amplifier	2W (RMS) per channel

Video card

Table 11. Video card specifications

Controller	Type	CPU Dependency	Graphics memory type	Capacity	External display support	Maximum resolution
Intel UHD Graphics 630	UMA	• Intel Core i3 - 8300/8100 • Intel Core i5 - 8600/8500 /8400 • Intel Core i7 - 8700 • Intel Xeon E Processor E-2174G/ E-2146G/ E-2124G	Integrated	Shared system memory	DisplayPort/HDMI 1.4	4096 x 2304
NVIDIA Quadro P1000	Discrete	N\A	GDDR5	4 GB	mDP/DisplayPort	5120 x 2880
NVIDIA Quadro P620	Discrete	N\A	GDDR5	2 GB	mDP/DisplayPort	5120 x 2880
NVIDIA Quadro P400	Discrete	N\A	GDDR5	2 GB	mDP/DisplayPort	5120 x 2880
AMD Radeon Pro WX4100	Discrete	N\A	GDDR5	4 GB	mDP	5120 x 2880
AMD Radeon Pro WX3100	Discrete	N\A	GDDR5	4 GB	mDP/DisplayPort	5120 x 2880
AMD Radeon Pro WX2100	Discrete	N\A	GDDR5	2 GB	mDP/DisplayPort	5120 x 2880

Communication

Table 12. Communication specifications

Network adapter	Integrated Intel i219-LM 10/100/1000 Mbps Ethernet (RJ-45) with Intel Remote Wake UP, PXE and Jumbo frames support

Wireless

Table 13. Wireless specifications

Intel Dual Band Wireless-AC 9560 802.11AC 2x2 Wi-Fi + BT 5 LE M.2 Wireless Card
Qualcomm QCA61x4A 802.11ac MU-MIMO Dual Band (2x2) Wi-Fi + Bluetooth 4.2 LE M.2 Wireless Card

Ports and connectors

Table 14. Ports and connectors

Memory card reader	SD card reader
Smart card reader	Optional
USB	• One USB 2.0 port with PowerShare • One USB 2.0 port (Front) • One USB 3.1 Gen 2 Type-C with PowerShare (Front) • One USB 3.1 Gen 1 port (Front) • Four USB 3.1 Gen 1 ports (Rear) • Two USB 2.0 ports (Rear)
Security	Noble wedge lock slot/Padlock Ring
Audio	• Universal audio jack
Video	• Display Port/HDMI 2.0b/VGA/USB Type C Display Port (optional) • Two Display Ports
Network adapter	One RJ-45 connector
Serial port	One serial port (optional)
PS/2	• Mouse • Keyboard

Power supply

Table 15. Power supply

Input voltage	100–240 VAC, 50–60 Hz
Wattage	• 200 W 100V-240V Full range • 260 W 100V-240V Full range

Security

Table 16. Security

Feature	Description
Trusted Platform Module (TPM) 2.0	Integrated on the system board
Firmware TPM	Optional
Windows Hello Support	Optional via security input device
Cable cover	Optional
Chassis intrusion switch	Standard
Dell Smartcard Keyboard	Optional

Table 16. Security (continued)

Feature	Description
Chassis lock slot and loop support	Standard

Security Software

Table 17. Security Software

Features	Description
Dell Endpoint Security Suite Enterprise	Optional
Dell Data Guardian	Optional
Dell Encryption (Enterprise or Personal)	Optional
Dell Threat Defense	Optional
RSA SecurID Access	Optional
RSA NetWitness Endpoint	Optional
MozyPro or MozyEnterprise	Optional
VMware Airwatch/WorkspaceONE	Optional
Absolute Data & Device Security	Optional

Operating system

Table 18. Operating system

Operating systems supported	• Windows 10 Home (64 bit) • Windows 10 Professional (64 bit) • Windows 10 Pro National Academic • Windows 10 Home • Ubuntu 16.04 LTS (64bit) • NeoKylin 6.0 • Red Hat Linux 7.5

Physical system dimensions

Table 19. Physical system dimensions

Chassis volume (liters)	7.8
Chassis weight (pounds / kilograms)	11.57 / 5.26

Table 20. Chassis dimensions

Height (inches / centimeters)	11.42 / 29
Width (inches / centimeters)	3.65 / 9.26

Table 20. Chassis dimensions (continued)

Depth (inches / centimeters)	11.50 / 29.2
Shipping weight (pounds / kilograms – includes packaging materials)	15.09 / 6.86

Table 21. Packaging parameters

Height (inches / centimeters)	10.38 / 26.4
Width (inches / centimeters)	19.2 / 48.7
Depth (inches / centimeters)	15.5 / 39.4

Environmental

NOTE: For more details on Dell environmental features, please go to the environmental attributes section. See your specific region for availability.

Table 22. Environmental

Energy efficient power supply	Internal
80 plus bronze certification	200 W EPA bronze (not available in North America or Brazil)
80 plus platinum certification	200 W (Only available in North America and Brazil) and 260 W EPA platinum
Recyclable packaging	Yes
MultiPack packaging	Optional, US only
Energy Star 6.1 (or later) Compliant (Windows and Ubuntu)	Yes

Computer environment

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

Table 23. Computer environment

Description	Operating	Storage
Temperature range	10 °C—35 °C (50 °F—95 °F)	-40 °C—65 °C (-40 °F—149 °F)
Relative humidity (maximum)	20% to 80% (non-condensing)	5% to 95% (non-condensing)
Vibration (maximum)*	0.52 GRMS random at 5 Hz to 350 Hz	2.0 GRMS random at 5 Hz to 350 Hz
Shock (maximum)	Bottom half-sine pulse with a change in velocity of 50.8 cm/sec (20 in./sec)	105 G half-sine pulse with a change in velocity of 133 cm/sec (52.5 in./sec)
Altitude (maximum)	3048 m (10000 ft)	10668 m (35000 ft)

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

† Measured using a 2 ms half-sine pulse when the hard drive is in use.

4

System setup

System setup enables you to manage your hardware and specify BIOS level options. From the System setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

- System setup
- Boot menu
- Navigation keys
- Boot Sequence
- System setup options
- Updating the BIOS in Windows
- System and setup password

System setup

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

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program 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.

Boot menu

Press <F12> when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- UEFI Boot:
  - Windows Boot Manager
- Other Options:
  - BIOS Setup
  - BIOS Flash Update
  - Diagnostics
  - Change Boot Mode Settings

Navigation keys

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

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) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

Boot Sequence

Boot sequence enables you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self-Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key.

The 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

  NOTE: XXXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

  NOTE: Choosing **Diagnostics**, displays the **SupportAssist** screen.

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

System setup options

NOTE: Depending on the and its installed devices, the items listed in this section may or may not appear.

General options

Table 24. General

Option	Description
System Information	Displays the following information: • System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date,** and the **Express Service Code**. • Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology, DIMM 1 Size,**, **DIMM 2 Size**. • PCI Information: Displays Slot1, Slot2, Slot3_M.2, Slot4_M.2

Table 24. General (continued)

Option	Description
	• Processor Information: Displays **Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable,** and **64-Bit Technology.** • Device Information: Displays **SATA-0, SATA 1, M.2 PCIe SSD-0, LOM MAC Address, Video Controller, Audio Controller, Wi-Fi Device, and Bluetooth Device.**
Boot Sequence	Allows you to specify the order in which the computer attempts to find an operating system from the devices specified in this list.
Advanced Boot Options	Allows you to select the Enable Legacy Option ROMs option, when in UEFI boot mode. By default, this option is selected. • Enable Legacy Option ROMs—Default • Enable Attempt Legacy Boot
UEFI Boot Path Security	This option controls whether or not the system will prompt the user to enter the Admin password when booting a UEFI boot path from the F12 Boot Menu. • Always, Except Internal HDD—Default • Always, Except Internal HDD&PXE • Always • Never
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

.

System information

Table 25. System Configuration

Option	Description
Integrated NIC	Allows you to control the on-board LAN controller. The option 'Enable UEFI Network Stack' is not selected by default. The options are: • Disabled • Enabled • Enabled w/PXE (default) **NOTE:** Depending on the computer and its installed devices, the items listed in this section may or may not appear.
Serial Port	Determines how the built-in serial port operates. Choose any one option: • Disabled • COM1 (selected by default) • COM2 • COM3 • COM4
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. • Disabled = The SATA controllers are hidden • AHCI = SATA is configured for AHCI mode • RAID ON = SATA is configured to support RAID mode (selected by default)
Drives	Allows you to enable or disable the various drives on-board:

Table 25. System Configuration (continued)

Option	Description
	• SATA-0 (enabled by default) • SATA-2 (enabled by default) • SATA-3 (enabled by default) • SATA-4 (enabled by default) • M.2 PCIe SSD-0 (enabled by default)
Smart Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. The **Enable Smart Reporting option** is disabled by default.
USB Configuration	Allows you to enable or disable the integrated USB controller for: • Enable USB Boot Support • Enable Front USB Ports • Enable Rear USB Ports All the options are enabled by default.
Front USB Configuration	Allows you to enable or disable the front USB ports. All the ports are enabled by default.
Rear USB Configuration	Allows you to enable or disable the back USB ports. All the ports are enabled by default.
USB PowerShare	This option allows you to charge the external devices, such as mobile phones, music player. This option is disabled by default.
Audio	Allows you to enable or disable the integrated audio controller. The option **Enable Audio** is selected by default. • Enable Microphone • Enable Internal Speaker Both the options are selected by default.
Dust Filter Maintenance	Allows you to enable or disable BIOS messages for maintaining the optional dust filter installed in your computer. BIOS will generate a pre-boot reminder to clean or replace the dust filter based on the interval set. The option **Disabled** is selected by default. • Disabled • 15 days • 30 days • 60 days • 90 days • 120 days • 150 days • 180 days
Miscellaneous Devices	Allows you to enable or disable various on board devices.. The option **Enable Secure Digital (SD) Card** is selected by default. • Enable Secure Digital (SD) Card • Secure Digital (SD) Card Boot • Secure Digital (SD) Card Read-Only Mode

Video screen options

Table 26. Video

Option	Description
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. • Auto (default) • Intel HD Graphics

Table 26. Video

Option	Description
	NOTE: If you do not select Auto, the on-board graphics device will be present and enabled.

Security

Table 27. Security

Option	Description
Admin Password	Allows you to set, change, and delete the admin password.
System Password	Allows you to set, change, and delete the system password.
Internal HDD-0 Password	Allows you to set, change, and delete the computer's internal HDD.
Strong Password	This option lets you enable or disable strong passwords for the system.
Password Configuration	Allows you to control the minimum and maximum number of characters allowed for a administrative password and the system password. The range of characters is between 4 and 32.
Password Bypass	This option lets you bypass the System (Boot) Password and the internal HDD password prompts during a system restart. ● Disabled — Always prompt for the system and internal HDD password when they are set. This option is disabled by default. ● Reboot Bypass — Bypass the password prompts on Restarts (warm boots). **NOTE:** The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.
Password Change	This option lets you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set. **Allow Non-Admin Password Changes** - This option is enabled by default.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)
TPM 2.0 Security	Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system. ● TPM On (default) ● Clear ● PPI Bypass for Enable Commands ● PPI Bypass for Disable Commands ● PPI Bypass for Clear Commands ● Attestation Enable (default) ● Key Storage Enable (default) ● SHA-256 (default) Choose any one option: ● Disabled ● Enabled (default)
Computrace	This field lets you Enable, Disable or Permanently Disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software. ● Enabled - This option is selected by default.

Table 27. Security (continued)

Option	Description
	• Disabled • Permanently Disabled
Chassis Intrusion	This field controls the chassis intrusion feature. Choose any one of the option: • Disabled (default) • Enabled • On-Silent
OROM Keyboard Access	This option determines weather users are able to enter Option ROM Configuration screens via hotkeys during boot. • Enabled (Default) • Disabled • One Time Enable
Admin Setup Lockout	Allows you to prevent users from entering Setup when Admin password is set. This option is not set by default.
Master Password Lockout	Allows you to disable master password support Hard Disk passwords need to be cleared before the settings can be changed. This option is not set by default.
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protections. This option is not set by default.

Secure boot options

Table 28. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature • Secure Boot Enable This option is not selected by default.
Secure Boot Mode	Allows you to modify the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. • Deployed Mode (default) • Audit Mode
Expert key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK (default) • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file • **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys

Table 28. Secure Boot (continued)

Option	Description
	NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.

Intel Software Guard Extensions options

Table 29. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. Click one of the following options: • **Disabled** • **Enabled** • **Software controlled**—Default
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size** Click one of the following options: • **32 MB** • **64 MB** • **128 MB**—Default

Performance

Table 30. Performance

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. • **All**—Default • **1** • **2** • **3**
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. • **Enable Intel SpeedStep** This option is set by default.
C-States Control	Allows you to enable or disable the additional processor sleep states. • **C states** This option is set by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • **Enable Intel TurboBoost** This option is set by default.

Power management

Table 31. Power Management

Option	Description
AC Recovery	Determines how the system responds when AC power is re-applied after a power loss. You can set the AC Recovery to: • Power Off—Default • Power On • Last Power State This option is Power Off by default.
Enable Intel Speed Shift Technology	Allows you to enable or disable Intel Speed Shift Technology support. The option **Enable Intel Speed Shift Technology** is set by default.
Auto On Time	Sets time to automatically turn on the computer. Time is kept in standard 12-hour format (hour:minutes:seconds). Change the startup time by typing the values in the time and AM/PM fields. **NOTE:** This feature does not work if you turn off your computer using the switch on a power strip or surge protector or if **Auto Power is set to disabled**.
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. • Disabled • Enabled in S5 only • Enabled in S4 and S5 This option is Enabled in S4 and S5 by default.
Fan Control Override	This field determines the speed of the fan. When enabled the system fan runs at full speed. This option is disabled by default.
USB Wake Support	Allows you to enable the USB devices to wake the computer from standby mode. The option **Enable USB Wake Support** is disabled by default
Wake on LAN/WWAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. This feature only works when the computer is connected to AC power supply. • **Disabled** - Does not allows the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • **LAN** or **WLAN** - Allows the system to be powered on by special LAN or wireless LAN signals. • **LAN Only** - Allows the system to be powered on by special LAN signals. • **LAN with PXE Boot** - A wakeup packet sent to the system in either the S4 or S5 state, that will cause the system to wake-up and immediately boot to PXE. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. This option is Disabled by default.
Block Sleep	Allows you to block entering to sleep in OS environment. This option is disabled by default.

Post behavior

Table 32. POST Behavior

Option	Description
Numlock LED	Allows you to enable or disable the Numlock feature when your computer starts. This option is enabled by default.
Keyboard Errors	Allows you to enable or disable the keyboard error reporting when the computer starts. The option **Enable Keyboard Error Detection** is enabled by default.
Fast Boot	This option can speed up the boot process by bypassing some compatibility steps:

Table 32. POST Behavior (continued)

Option	Description
	• Minimal — The system boots quickly, unless the BIOS has been updated, memory changed, or the previous POST did not complete. • Thorough — The system does not skip any steps in the boot process. • Auto — This allows the operating system to control this setting (this works only when the operating system supports Simple Boot Flag). This option is set to **Thorough** by default.
Extend BIOS POST Time	This option creates an additional pre-boot delay. • 0 seconds (default) • 5 seconds • 10 seconds
Full Screen Logo	This option will display full screen logo if your image match screen resolution. The option **Enable Full Screen Logo** is not set by default.
Warnings and Errors	This option causes the boot process to only pause when warning or errors are detected. Choose any one of the option: • Prompt on Warnings and Errors—Default • Continue on Warnings • Continue on Warnings and Errors

Manageability

Table 33. Manageability

Option	Description
USB provision	This option is not selected by default.
MEBx Hotkey	This option is selected by default.

Virtualization support

Table 34. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by the Intel Virtualization technology. • **Enable Intel Virtualization Technology** This option is set by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by the Intel Virtualization technology for direct I/O. • **Enable VT for Direct I/O** This option is set by default.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. • Trusted Execution This option is not set by default.

Wireless options

Table 35. Wireless

Option	Description
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. The options are: • **WLAN/WiGig** • **Bluetooth** All the options are enabled by default.

Maintenance

Table 36. Maintenance

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
SERR Messages	Controls the SERR message mechanism. This option is set by default. Some graphics cards require that the SERR message mechanism be disabled.
BIOS Downgrade	Allows you to flash previous revisions of the system firmware. • **Allow BIOS Downgrade** This option is set by default.
Data Wipe	Allows you to securely erase data from all internal storage devices. • **Wipe on Next Boot** This option is not set by default.
Bios Recovery	**BIOS Recovery from Hard Drive**—This option is set by default. Allows you to recover the corrupted BIOS from a recovery file on the HDD or an external USB key. **BIOS Auto-Recovery**— Allows you to recover the BIOS automatically. **NOTE: BIOS Recovery from Hard Drive** field should be enabled. **Always Perform Integrity Check**—Performs integrity check on every boot.
First Power On Date	Allows you the set Ownership date. The option **Set Ownership Date** is not set by default.

System logs

Table 37. System Logs

Option	Description
BIOS events	Allows you to view and clear the System Setup (BIOS) POST events.

Advanced configuration

Table 38. Advanced configuration

Option	Description
ASPM	Allows you to set the ASPM level. • Auto (default) - There is handshaking between the device and PCI Express hub to determine the best ASPM mode supported by the device • Disabled - ASPM power management is turned off at all time • L1 Only - ASPM power management is set to use L1

Updating the BIOS in Windows

It is recommended to update your BIOS (System Setup) when you replace the system board or if an update is available.

NOTE: If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re enabled after the BIOS update is completed.

1. Restart the computer.
2. Go to **Dell.com/support**.
   - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
   - Click **Detect Product** and follow the instructions on screen.
3. If you are unable to detect or find the Service Tag, click **Choose from all products**.
4. Choose the **Products** category from the list.

   NOTE: Choose the appropriate category to reach the product page.

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
   The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
    The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.
    Follow the instructions on the screen.

Updating BIOS on systems with BitLocker enabled

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and 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 Article: Updating the BIOS on Dell Systems With BitLocker Enabled

Updating your system BIOS using a USB flash drive

If the system cannot load into Windows, but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

NOTE: You will need to use a bootable USB flash drive. Please refer to the following article for further details How to Create a Bootable USB Flash Drive using Dell Diagnostic Deployment Package (DDDP)

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB flash drive.
3. Insert the USB flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell splash logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and click **Enter**.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename, for example, O9010A12.exe and press **Enter**.
8. The BIOS Update Utility will load. Follow the instructions on screen.

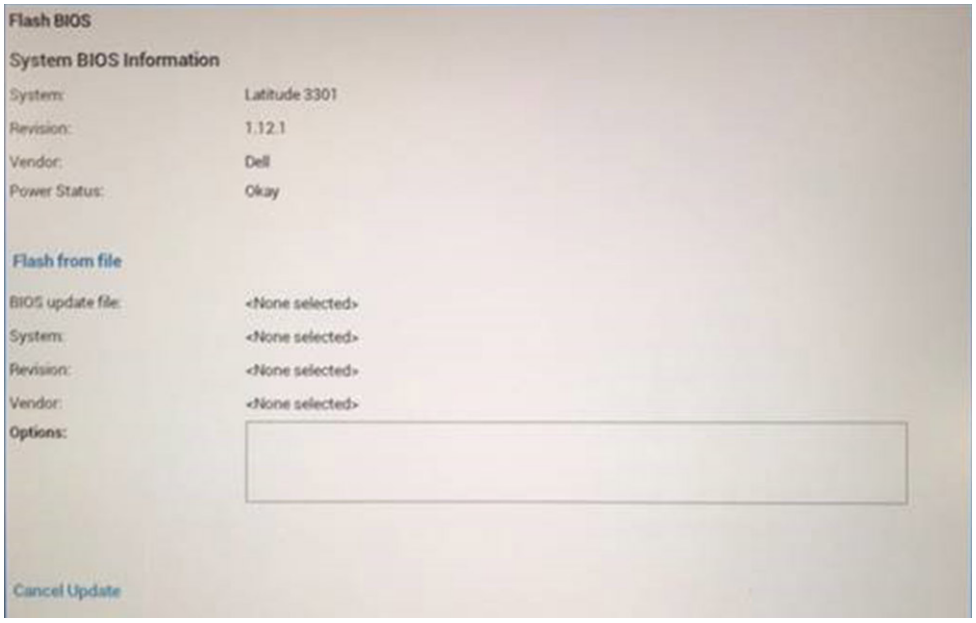


Figure 1. DOS BIOS Update Screen

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment, such as Ubuntu, see https://www.dell.com/support/article/sln171755/.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a BIOS update .exe file copied to a FAT32 USB key and booting from the F12 one time boot menu.

BIOS Update

You can run the BIOS update file from Windows using a bootable USB key or you can also update the BIOS from the F12 One-Time boot menu on the system.

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

NOTE: Only systems 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 will need:

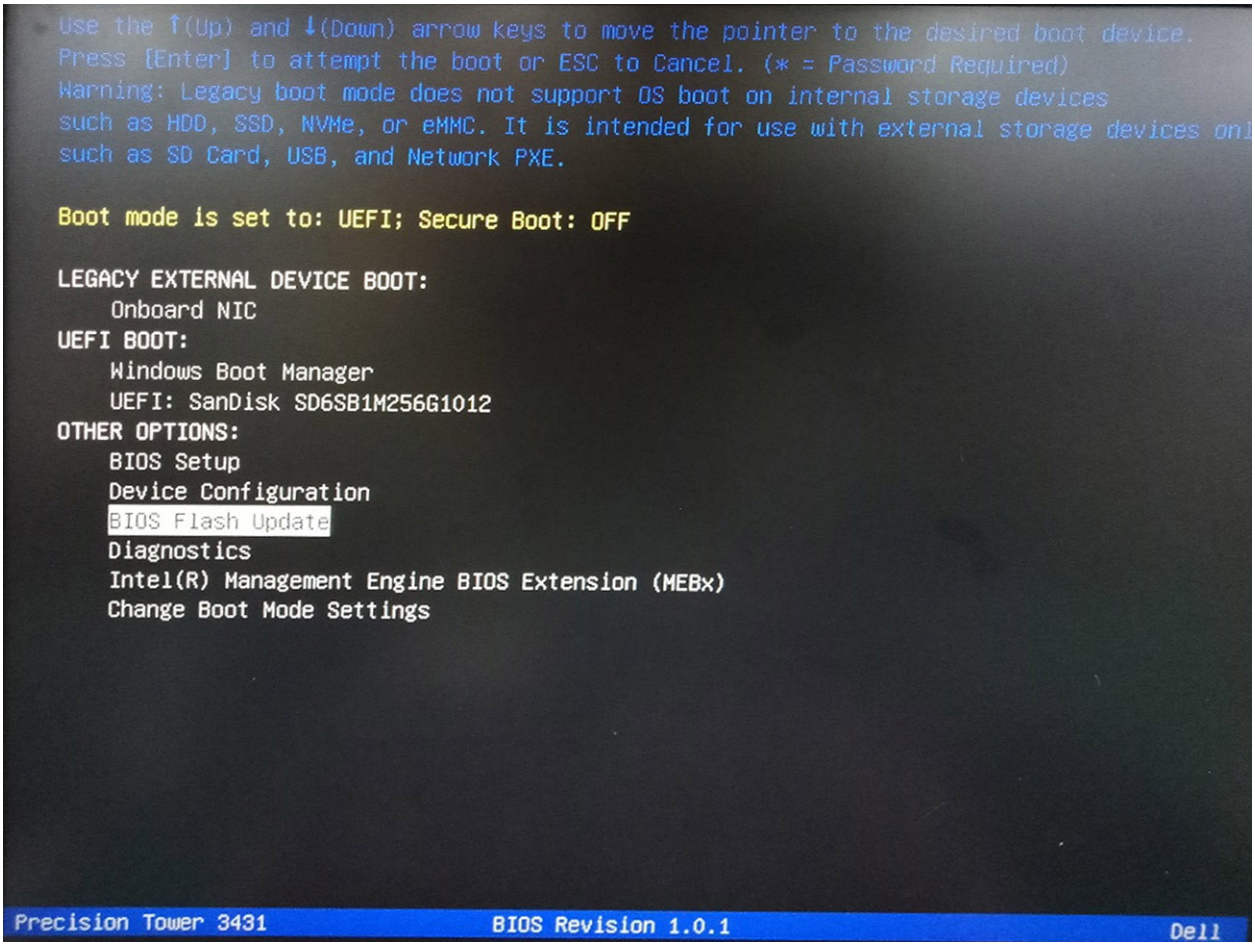
- USB key formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB key
- AC power adapter connected to the system

- Functional system battery to flash the BIOS

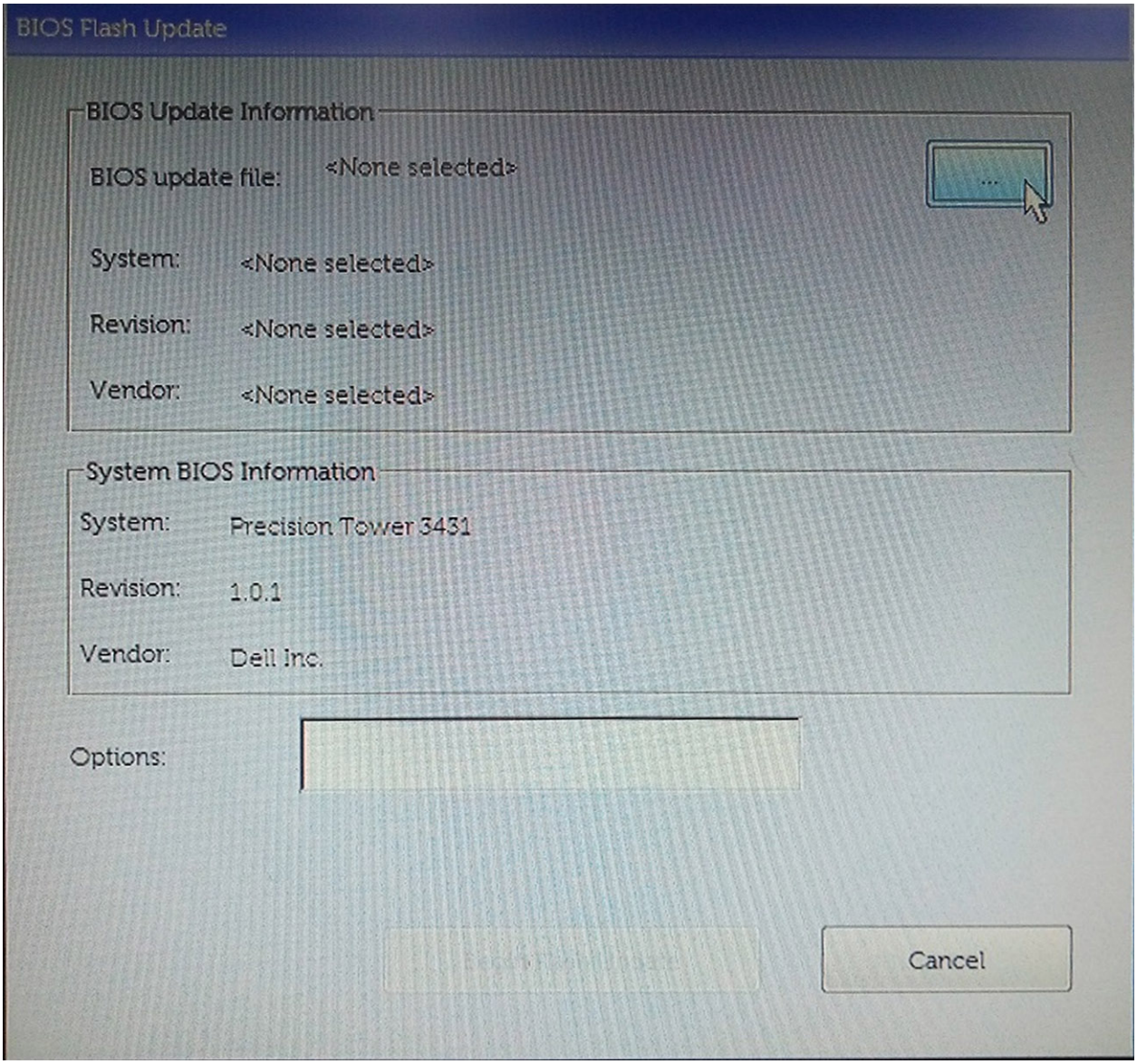
Perform the following steps to execute the BIOS update flash process from the F12 menu:

CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.

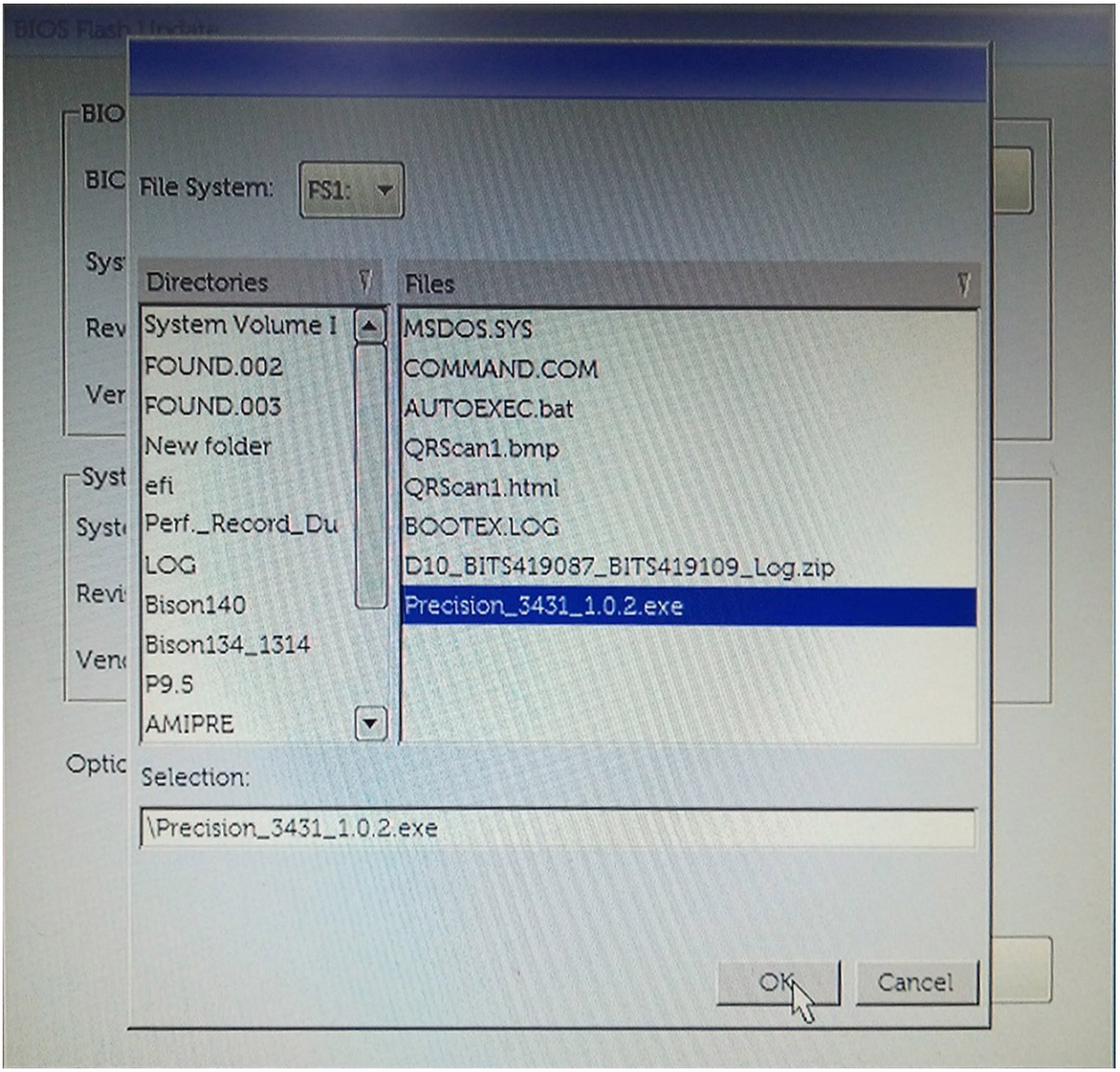
1. From a power off state, insert the USB key where you copied the flash into a USB port of the system .
2. Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight **BIOS Flash Update** using the arrow keys then press **Enter**.



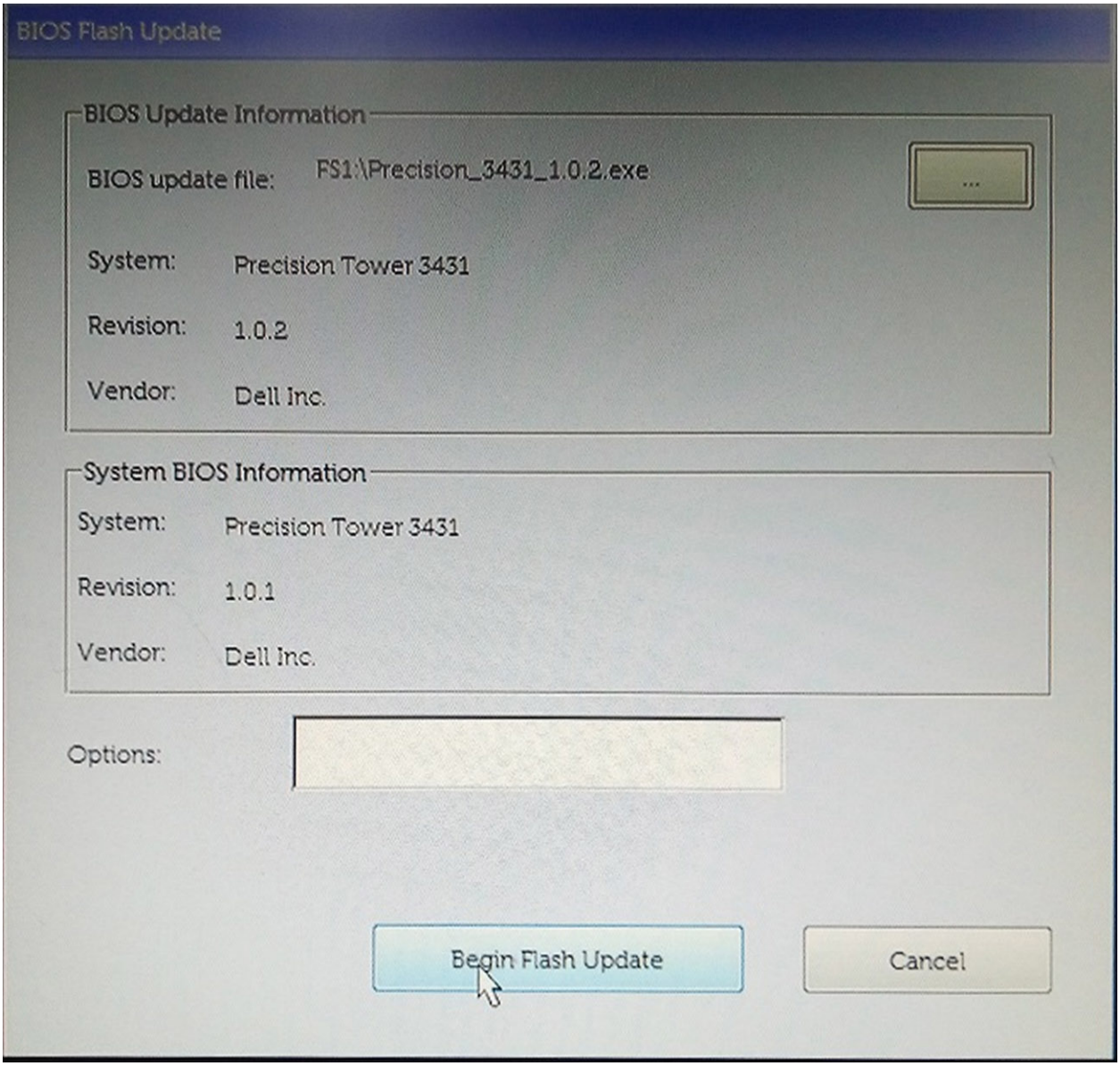
3. The Bios Flash Update dialog box menu is opened. Click **BIOS Update file** browse button to select the BIOS file.



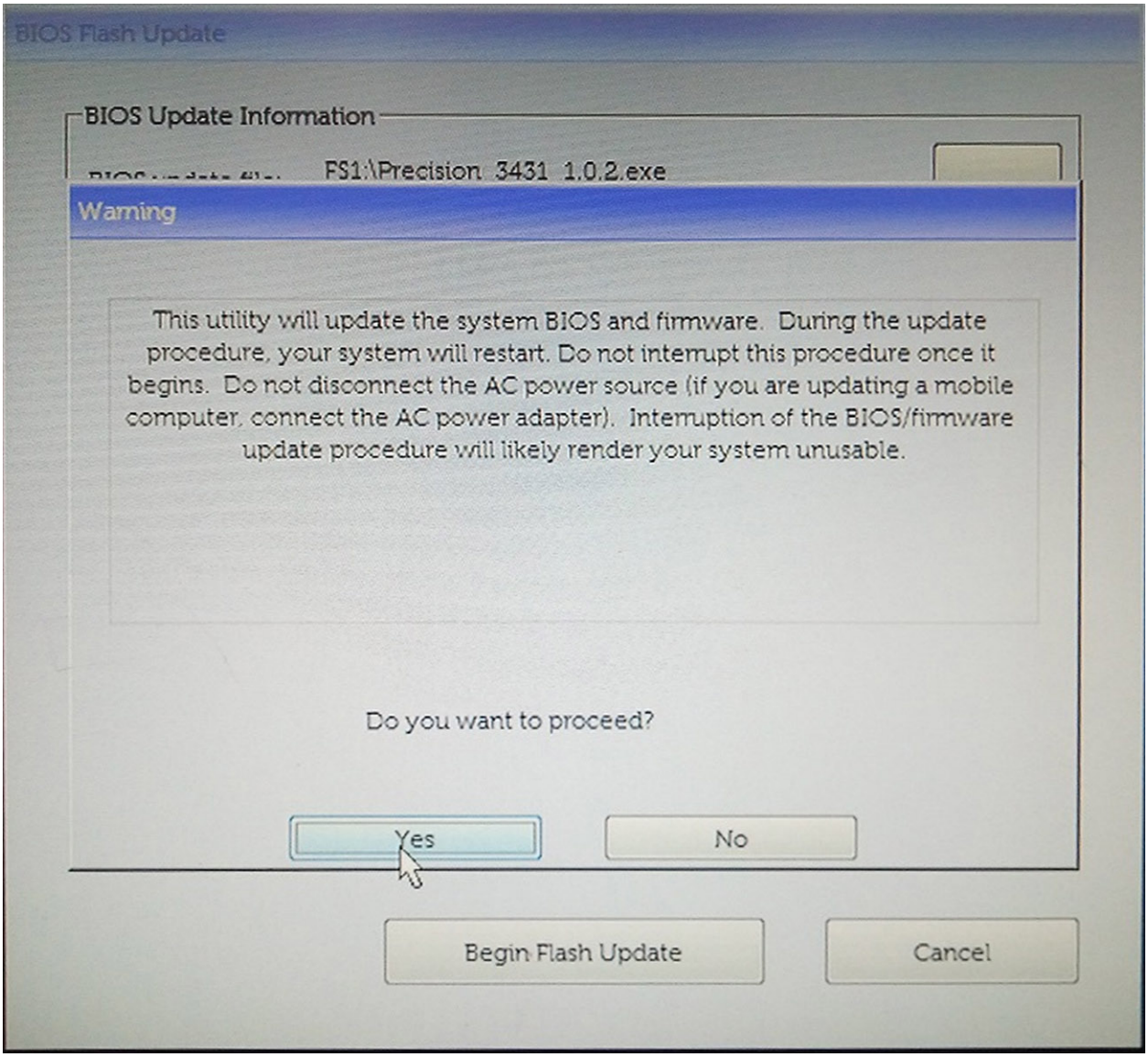
4. Select the BIOS executable file and then press **OK**. Switch to correct catalogue of your external USB device by **File system** if you do not find the BIOS executable file.



5. Click **Begin Flash Update**, and then a warning message is displayed.



6. Click **Yes**. The systems restarts automatically and starts BIOS Flash.



7. Once complete, the system will reboot and the BIOS update process is completed.

System and setup password

Table 39. System and setup password

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

You can create a system password and a setup password to secure your computer.

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

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

To enter the system setup, press F2 immediately after a power-on or reboot.

1. In the **System BIOS** or **System Setup** screen, select **Security** and press **Enter**.
   The **Security** screen is displayed.
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.
   - The password can contain the numbers 0 through 9.
   - Only lower case letters are valid, upper case letters are not allowed.
   - Only the following special characters are allowed: space, (”), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press **Esc** and a message prompts you to save the changes.
5. Press **Y** to save the changes.
   The computer reboots.

Deleting or changing an existing system setup password

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

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

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**, alter or delete the existing system password and press **Enter** or **Tab**.
4. Select **Setup Password**, alter or delete the existing setup password and press **Enter** or **Tab**.

   NOTE: If you change the System and/or Setup password, re enter the new password when prompted. If you delete the System and Setup password, confirm the deletion when prompted.
5. Press **Esc** and a message prompts you to save the changes.
6. Press **Y** to save the changes and exit from System Setup.
   The computer restarts.

5

Software

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

Topics:

- Operating system
- Downloading Windows drivers

Operating system

Table 40. Operating system

Operating systems supported	• Windows 10 Home (64 bit) • Windows 10 Professional (64 bit) • Windows 10 Pro National Academic • Windows 10 Home • Ubuntu 16.04 LTS (64bit) • NeoKylin 6.0 • Red Hat Linux 7.5

Downloading Windows drivers

1. Turn on the .
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your , and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed on your .
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver for your .
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the driver file icon and follow the instructions on the screen.

6

Getting help

Topics:

- Contacting Dell

Contacting Dell

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

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

1. Go to **Dell.com/support**.
2. Select your support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.