Dell OptiPlex 3070 Small Form Factor

Setup and Specifications

Notes, cautions, and warnings

(i) **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

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.

   (i) **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.
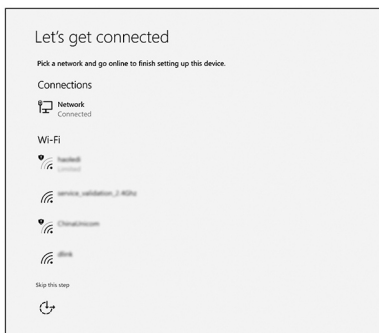
   b) Sign-in to your Microsoft account or create a new account.
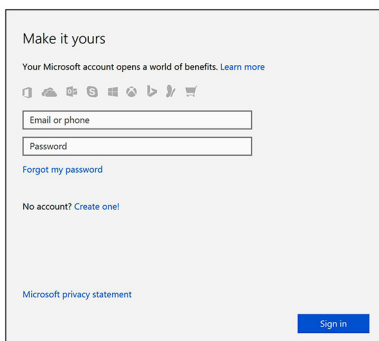
7. Locate Dell apps.

   Table 1. Locate Dell apps

	Register your computer

Dell Help & Support
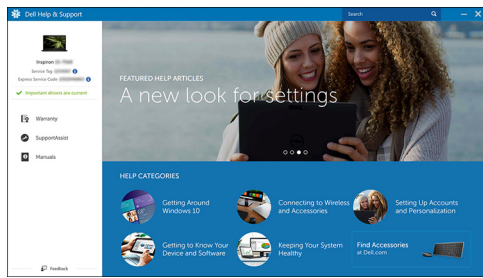
SupportAssist — Check and update your computer

Chassis

This chapter illustrates the multiple chassis views along with the ports and connectors and also explains the FN hot key combinations.

Topics:

- Front view
- Small Form Factor Computer Views

Front view
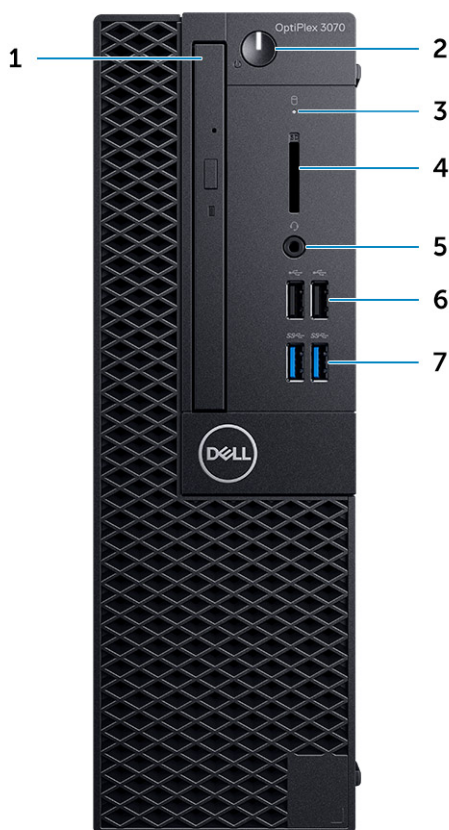
1. Optical drive (optional)
2. Power button and power light/diagnostic LED
3. Hard-drive activity light
4. Memory card reader (optional)
5. Headset/Universal audio jack port
6. USB 2.0 ports (2)
7. USB 3.1 Gen 1 ports (2)

Small Form Factor Computer Views

Back view
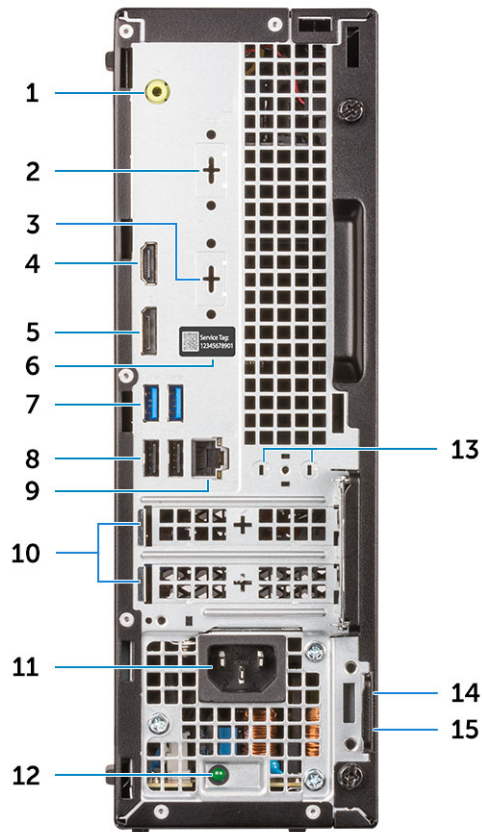
1. Line-out port
2. Serial Port (optional)
3. DP/HDMI2.0b/VGA port (optional)
4. HDMI port
5. DisplayPort
6. Service tag
7. USB 3.1 Gen 1 ports (2)
8. USB 2.0 ports (2) (supports Smart Power On)
9. Network port
10. Expansion card slots (2)
11. Power connector port
12. Power supply diagnostic light
13. External antenna connectors
14. Kensington security cable slot
15. Padlock ring

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:

Chipset

Table 2. Chipset

	Tower/Small form factor/Micro
Chipset	H370
Non-volatile memory on chipset	
BIOS Configuration SPI (Serial Peripheral Interface)	256Mbit (32MB) located at SPI_FLASH on chipset
Trusted Platform Module (TPM) 2.0 Security Device (Discrete TPM Enabled)	24KB located at TPM 2.0 on chipset
Firmware-TPM (Discrete TPM disabled)	By default the Platform Trust Technology feature is visible to the OS.
NIC EEPROM	LOM configuration contained within LOM e-fuse – no dedicated LOM EEPROM

Processor

ⓘ **NOTE: Global Standard Products (GSP) are a subset of Dell's relationship products that are managed for availability and synchronized transitions on a worldwide basis. They ensure the same platform is available for purchase globally. This allows customers to reduce the number of configurations managed on a worldwide basis, thereby reducing their costs. They also enable companies to implement global IT standards by locking in specific product configurations worldwide.**

Device Guard (DG) and Credential Guard (CG) are the new security features that are only available on Windows 10 Enterprise today.

Device Guard is a combination of enterprise-related hardware and software security features that, when configured together, will lock a device down so that it can only run trusted applications. If it is not a trusted application, it cannot run.

Credential Guard uses virtualization-based security to isolate secrets (credentials) so that only privileged system software can access them. Unauthorized access to these secrets can lead to credential theft attacks. Credential Guard prevents these attacks by protecting NTLM password hashes and Kerberos Ticket Granting Tickets

> (i) **NOTE: Processor numbers are not a measure of performance. Processor availability subject to change and may vary by region/country.**

> (i) **NOTE: These are available offline only.**

Table 3. Processor

Intel Core Processors 9th Gen Core CPUs	Tower/ Small Form Factor	Micro	GSP	DG/CG Ready
Intel® Celeron G4930 (2 Cores/2MB/2T/ 3.2GHz/65W); supports Windows 10/Linux	X			X
Intel® Celeron G4930T (2 Cores/2MB/2T/ 3.0GHz/35W); supports Windows 10/Linux		X		X
Intel® Pentium G5420 (2 Cores/4MB/4T/ 3.8GHz/65W); supports Windows 10/Linux	X			X
Intel® Pentium G5420T (2 Cores/4MB/4T/ 3.2GHz/35W); supports Windows 10/Linux		X		
Intel® Pentium G5600 (2 Cores/4MB/4T/ 3.9GHz/65W); supports Windows 10/Linux	X			X
Intel® Pentium G5600T (2 Cores/4MB/4T/ 3.3GHz/35W); supports Windows 10/Linux		X		X
Intel® Core™ i3-9100 (4 Cores/6MB/4T/ 3.6GHz to 4.2GHz/65W); supports Windows 10/Linux	X			X
Intel® Core™ i3-9100T (4 Cores/6MB/4T/ 3.1GHz to 3.7GHz/35W); supports Windows 10/ Linux		X		X
Intel® Core™ i3-9300 (4 Cores/8MB/4T/ 3.7GHz to 4.3GHz/65W); supports Windows 10/Linux	X			X
Intel® Core™ i3-9300T (4 Cores/8MB/4T/ 3.2GHz to 3.8GHz/35W); supports Windows 10/Linux		X		X
Intel® Core™ i5-9400 (6 Cores/9MB/6T/ 2.9GHz to 4.1GHz/65W); supports Windows 10/Linux	X			X
Intel® Core™ i5-9400T (6 Cores/9MB/6T/ 1.8GHz to 3.4GHz/35W); supports Windows 10/ Linux		X		X
Intel® Core™ i5-9500 (6 Cores/9MB/6T/ 3.0GHz to 4.4GHz/65W); supports Windows 10/Linux				X

Intel Core Processors 9th Gen Core CPUs	Tower/ Small Form Factor	Micro	GSP	DG/CG Ready
Intel® Core™ i5-9500T (6 Cores/9MB/6T/ 2.2GHz to 3.7GHz/35W); supports Windows 10/Linux				x
Intel® Core™ i7-9700 (8 Cores/12MB/8T/ 3.0GHz to 4.8GHz/65W); supports Windows 10/Linux	x			x
Intel® Core™ i7-9700T (8 Cores/12MB/8T/ 2.0GHz to 4.3GHz/35W); supports Windows 10/Linux		x		x

Table 4. Processor

Intel Core Processors 8th Gen Core CPUs	Tower	Small Form Factor	Micro	GSP	DG/CG Ready
Intel Core i7-8700 (6 Cores/12 MB/12T/up to 4.6 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No	GSP	Yes
Intel Core i5-8500 (6 Cores/9 MB/6T/up to 4.1 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No	GSP	Yes
Intel Core i5-8400 (6 Cores/9 MB/6T/up to 4.0 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No	GSP	Yes
Intel Core i3-8300 (4 Cores/8 MB/4T/3.7 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No		Yes
Intel Core i3-8100 (4 Cores/6 MB/4T/3.6 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No		Yes
Intel Pentium Gold G5500 (2 Cores/4 MB/4T/3.8 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No		Yes
Intel Pentium Gold G5400 (2 Cores/4 MB/4T/3.7 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No		Yes
Intel Celeron G4900 (2 Cores/2 MB/2T/up to 3.1 GHz/65 W); supports Windows 10/Linux	Yes	Yes	No		Yes
Intel Core i7-8700T (6 Cores/12 MB/12T/up to 4.0 GHz/35 W); supports Windows 10/Linux	No	No	Yes	GSP	Yes
Intel Core i5-8500T (6 Cores/9 MB/6T/up to 3.5 GHz/35 W); supports Windows 10/Linux	No	No	Yes	GSP	Yes
Intel Core i5-8400T (6 Cores/9 MB/6T/up to 3.3 GHz/35 W); supports Windows 10/Linux	No	No	Yes	GSP	Yes
Intel Core i3-8300T (4 Cores/8 MB/4T/3.2 GHz/35 W); supports Windows 10/Linux	No	No	Yes		Yes
Intel Core i3-8100T (4 Cores/6 MB/4T/3.1 GHz/35 W); supports Windows 10/Linux	No	No	Yes		Yes
Intel Pentium Gold G5500T (2 Cores/4 MB/4T/3.2 GHz/35 W); supports Windows 10/Linux	No	No	Yes		
Intel Pentium Gold G5400T (2 Cores/4 MB/4T/3.1 GHz/35 W); supports Windows 10/Linux	No	No	Yes		
Intel Celeron G4900T (2 Cores/2 MB/2T/2.9 GHz/35 W); supports Windows 10/Linux	No	No	Yes		

Memory

ⓘ **NOTE: Memory modules should be installed in pairs of matched memory size, speed, and technology. If the memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance. The entire memory range is available to 64-bit operating systems.**

Table 5. Memory

	Tower	Small Form Factor	Micro
Type: DDR4 DRAM Non-ECC Memory	2666 MHz on i5 and i7 processors (performs at 2400 MHz on Celeron, Pentium and i3 processors)		
DIMM Slots	2	2	2 (SODIMM)
DIMM Capacities	Up to 16 GB	Up to 16 GB	Up to 16 GB
Minimum Memory	4 GB	4 GB	4 GB
Maximum System Memory	32 GB	32 GB	32 GB
DIMMs/Channel	2	2	1
UDIMM support	Yes	Yes	No
Memory configurations:			
32 GB DDR4, 2666 MHz, (2 x 16 GB)	Yes	Yes	Yes
16 GB DDR4, 2666 MHz, (1 x 16 GB)	Yes	Yes	Yes
16 GB DDR4, 2666 MHz, (2 x 8 GB)	Yes	Yes	Yes
8 GB DDR4, 2666 MHz, (1 x 8 GB)	Yes	Yes	Yes
8 GB DDR4, 2666 MHz, (2 x 4 GB)	Yes	Yes	Yes
4 GB DDR4, 2666 MHz, (1 x 4 GB)	Yes	Yes	Yes

Intel Optane Memory

ⓘ **NOTE: Intel Optane memory cannot replace DRAM entirely. However, these two memory technologies complement each other within the PC.**

Table 6. M.2 16 GB Intel Optane

	Tower/Small form factor/Micro
Capacity (TB)	16 GB
Dimensions (inches) (W x D x H)	22 x 80 x 2.38
Interface type and Maximum speed	PCIe Gen2
MTBF	1.6 M hours
Logical Blocks	28,181,328
Power Source:	
Power Consumption (reference only)	Idle 900 mW to 1.2 W, Active 3.5 W
Environmental Operating Conditions (Non-Condensing):	
Temperature Range	0°C to 70°C
Relative Humidity Range	10 to 90%
Op Shock (@2 ms)	1,000G

Environmental Non-Operating Conditions (Non-Condensing):	
Temperature Range	-10°C to 70°C
Relative Humidity Range	5 to 95%

Storage

Table 7. Storage

	Tower	Small form factor	Micro
Bays:			
Optical Drives Supported	1 Slim	1 Slim	0
Hard Drive Bay Supported (Internal)	1x3.5"/2x2.5"	1x3.5" or 1x2.5"	1x2.5"
Hard Drives Supported 3.5"/2.5" (maximum)	1/2	1/1	0/1
Interface:			
SATA 2.0	1	1	0
SATA 3.0	2	1	1
M.2 Socket 3 (for SATA / NVMe SSD)	1	1	1
M.2 Socket 1 (for WiFi/BT card)	1	1	1
3.5" Drives:			
3.5 inch 500 GB 7200 RPM HDD	Y	Y	N
3.5 inch 1 TB 7200 RPM HDD	Y	Y	N
3.5 inch 2 TB 7200 RPM HDD	Y	Y	N
2.5" Drives:			
2.5 inch 500 GB 5400 RPM HDD	Y	Y	Y
2.5 inch 512 GB 7200 RPM HDD	Y	Y	Y
2.5 inch 512 GB 7200 RPM SED HDD	Y	Y	Y
2.5 inch 1 TB 7200 RPM HDD	Y	Y	Y
2.5 inch 2 TB 5400 RPM HDD	Y	Y	Y
M.2 Drives:			
M.2 1 TB PCIe C40 SSD	Y	Y	Y
M.2 256 GB PCIe C40 SSD	Y	Y	Y
M.2 512 GB PCIe C40 SSD	Y	Y	Y
M.2 128 GB PCIe NVMe Class 35 Solid State Drive	Y	Y	Y
M.2 256 GB PCIe NVMe Class 35 Solid State Drive	Y	Y	Y
M.2 512 GB PCIe NVMe Class 35 Solid State Drive	Y	Y	Y

(i) **NOTE: 2.5 Inch Solid State Drives are only available as a secondary storage option and can only be paired with a M.2 Solid State Drive as the Primary Storage Device**

Audio and speakers

Table 8. Audio and speakers

	Tower/**Small Form Factor**/Micro
Realtek ALC3234 High Definition Audio Codec (supports multiple streaming)	Integrated
Audio enhancement software	Wave MaxxAudioPro (Standard)
Internal speaker (mono)	Integrated
Speaker Performance, Speech Grade & Electrical Grade	Grade D
Dell 2.0 Speaker System - AE215	Optional
Dell 2.1 Speaker System - AE415	Optional
Dell AX210 USB Stereo speakers	Optional
Dell Wireless 360 Speaker System - AE715	Optional
AC511 Sound Bar	Optional
Dell Professional Sound Bar - AE515	Optional
Dell Stereo Soundbar - AX510	Optional
Dell Performance USB Headset - AE2	Optional
Dell Pro Stereo Headsets - UC150/UC350	Optional

Graphics and Video Controller

ⓘ **NOTE:** Tower supports Full Height (FH) cards and Small Form Factor supports low profile (LP) cards.

Table 9. Graphics / Video Controller

	Tower	**Small Form Factor**	Micro
Intel UHD 630 Graphics [with 8th Generation Core i3/i5/i7 CPU-GPU combo]	Integrated on CPU	Integrated on CPU	Integrated on CPU
Intel UHD 610 Graphics [with 8th Generation Pentium CPU-GPU combo]	Integrated on CPU	Integrated on CPU	Integrated on CPU
Enhanced Graphic/ Video Options			
2 GB AMD Radeon R5 430	Optional	Optional	Not available
4 GB AMD Radeon RX 550	Optional	Optional	Not available
2 GB NVIDIA GT 730	Optional	Optional	Not available

Communications – Integrated

Table 10. Communications – Integrated Realtek RTL8111HSD-CG

	Tower/Small Form Factor/Micro
Realtek RTL8111HSD-CG Gigabit Ethernet LAN 10/100/1000	Integrated on system board

Communications – Wireless

Table 11. Communications – Wireless

	Tower/Small form factor/Micro
Qualcomm QCA9377 Dual-band 1x1 802.11ac Wireless + Bluetooth 4.1	Yes
Qualcomm QCA61x4A Dual-band 2x2 802.11ac Wireless + Bluetooth 4.2	Yes
Intel Wireless-AC 9560, Dual-band 2x2 802.11ac Wi-Fi with MU-MIMO + Bluetooth 5	Yes
Internal Wireless Antennas	Yes
External Wireless Connectors and Antenna	Yes
Support for 802.11n and 802.11ac wireless NIC	Yes via M.2
Energy-Efficient Ethernet capability as specified in IEEE 802.3az-2010. (required for California Energy Commission MEPs)	Yes

External ports and connectors

(i) **NOTE:** Tower supports Full Height (FH) cards and Small Form Factor supports Low Profile (LP) cards. See chassis diagrams section for port/connector locations.

Table 12. External ports / connectors

	Tower	Small Form Factor	Micro
USB 2.0 (Front/Rear/Internal)	2/2/2	2/2/2	0/2/0
USB 3.1 Gen 1 (Front/Rear/Internal)	2/2/0	2/2/0	2/2/0

Serial	Parallel/Serial PCIe card or PS/2/Serial add-in bracket (Optional)	Low Profile Serial PCIe card or PS/2 & Serial port add in bracket (Optional)	• Available in 2 options
			  • Serial port (Optional)
			  • Serial and PS/2 via fan out cable (Optional)

Network Connector (RJ-45)	1 Rear	1 Rear	1 Rear
Video:			
DisplayPort 1.2	1 Rear	1 Rear	1
HDMI 1.4 port	1 Rear	1 Rear	1 Rear
Support for Dual 50W Graphics	No	No	No
Support for Dual 25W Graphics	No	No	No
Integrated Graphics output - 3rd optional video out: VGA, DP, or HDMI 2.0b	Optional	Optional	Optional

	Tower	Small Form Factor	Micro
Audio:			
Line out for headphones or speakers	1 Rear	1 Rear	1 Front
Universal Audio Jack	1 Front	1 Front	1 Front

System board connectors

(i) **NOTE: See Detailed Engineering Specifications for maximum card dimensions.**

Table 13. System board connectors

	Tower	Small Form Factor	Micro
PCIe x16 Slot(s) [1]	1	1	0
PCIe x1 Slot(s)	3	1	0
Serial ATA (SATA) [2]	3	2	1
M.2 Socket 3 [3] (for SSD)	1 - 2230/2280	1 - 2230/2280	1 - 2230/2280
M.2 Socket 1 [4] (for WiFi/BT card)	1 - 2230 (keyed to support Integrated or Discrete WiFi)	1 - 2230 (keyed to support Integrated or Discrete WiFi)	1 - 2230 (keyed to support Integrated or Discrete WiFi)

[1] PCIe x16 Slots (Support Standard Rev 3.0)

[2] Serial ATA (2 ports Support Standard Rev 3.0, the rest of ports Support Standard Rev 2.0)

[3] M.2 Socket3: Support SATA/ PCIe SSD/Optane interface for 3070. Support for NVMEx4 and SATA

[4] M.2 Socket1: Supports Intel CNVi, USB2.0 and PCIe interface

Operating system

This topic lists the operating system supported by
Table 14. Operating system

Operating system	Tower/Small form factor/Micro
Windows operating system	Microsoft Windows 10 Home (64-bit)
	Microsoft Windows 10 Pro (64-bit)
	Microsoft Windows 10 Pro National Academic
	Microsoft Windows 10 Home National Academic
	Microsoft Windows 10 China

Operating system	Tower/Small form factor/Micro
Other	Ubuntu 18.04 LTS (64-bit)
	Neokylin v6.0 (China only)
	Commercial Platform Windows 10 N-2 and 5 year OS Supportability
	All newly introduced 2019 and later commercial platforms (Latitude, OptiPlex, and Precision) will qualify and ship with the most current factory installed Semi-Annual Channel Windows 10 version (N) and qualify (but not ship) the previous two versions (N-1, N-2). This device platform OptiPlex 3070 will RTS with Windows 10 version v19H1 at time of launch, and this version will determine the N-2 versions that are initially qualified for this platform.
	For future versions of Windows 10, Dell will continue to test the commercial platform with coming Windows 10 releases during device production and for five years post-production, including both fall and spring releases from Microsoft.
	Please reference the Dell Windows as a Service (WaaS) website for additional information on N-2 and 5 year Windows OS supportability. Website can be found at this link:
	Platforms Qualified on specific versions of Windows 10
	This website also includes a matrix of other platforms qualified on specific versions of Windows 10.

Power supply

Table 15. Power supply

Input Voltage	100-240 Vac
Input current (maximum)	
Wattage	

Physical specifications

Table 16. Physical system dimensions

Chassis volume (liters)	
Chassis weight (pounds / kilograms)	

Table 17. Chassis dimensions

Height (inches / centimeters)	
Width (inches / centimeters)	
Depth (inches / centimeters)	
Shipping weight (pounds / kilograms – includes packaging materials)	

Table 18. Packaging parameters

Height (inches / centimeters)	
Width (inches / centimeters)	
Depth (inches / centimeters)	

Regulatory and Environmental Compliance

Product related conformity assessment and regulatory authorizations including Product Safety, Electromagnetic Compatibility (EMC), Ergonomics, and Communication Devices relevant to this product may be viewed at www.dell.com/regulatory_compliance. The Regulatory Datasheet for this product is located at http://www.dell.com/regulatory_compliance.

Details of Dell's environmental stewardship program to conserve product energy consumption, reduce or eliminate materials for disposal, prolong product life span and provide effective and convenient equipment recovery solutions may be viewed at www.dell.com/environment. Product related conformity assessment, regulatory authorizations, and information encompassing Environmental, Energy Consumption, Noise Emissions, Product Materials Information, Packaging, Batteries, and Recycling relevant to this product may be viewed by clicking the Design for Environment link on the webpage.

This OptiPlex 3070 system is TCO 5.0 Certified.

Table 19. Regulatory/Environmental Certifications

	Tower/ Small form factor/ Micro
Energy Star 7.0/7.1 Compliant (Windows & Ubuntu)	Yes
Br/CL Reduction: Plastic parts above 25 grams shall not contain greater than 1000 ppm chlorine or greater than 1000 ppm bromine at the homogenous level. Following can be excluded: - Printed circuit boards, cable and wiring, fans, and electronic components Anticipated Required Criteria for EPEAT Revision Effective 1H 2018	Yes
Minimum 2% Post-Consumer Recycled (PCR) plastics as standard in product. Anticipated Required Criteria for EPEAT Revision Effective 1H 2018	Yes
Higher level % Post-Consumer Recycled (PCR) plastics in product: * DT, Workstations, Thin Clients - 10% * Integrated Desktop Computers (AIO) 15% (Anticipated 1 Optional point in the EPEAT Revision for higher level PCR)	Yes
BFR / PVC Free: (aka Halogen Free) : The system shall comply with the limits defined in Dell specification ENV0199 - BFR/CFR/PVC-Free Specification.	Yes

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:

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

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

(i) **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.

System setup options

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

General options

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, SLOT 2, SLOT1_M.2, SLOT2_M.2 • 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 4, 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. • **Windows Boot Manager** • **ONboard NIC (IPV4)** • **Onboard NIC (IPV6)**
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 and PXE • Always • Never
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.

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System information

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

Option	Description
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: • **SATA-0** • **SATA-4** • **M.2 PCIe SSD-0**
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 rear 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 enabled 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. • **Disabled** (default) • 15 days • 30 days • 60 days • 90 days • 120 days • 150 days • 180 days

Video screen options

Option	Description
Primary Display	Allows you to select the primary display when multiple controllers are available in the system. • **Auto** (default) • Intel HD Graphics (i) **NOTE: If you do not select Auto, the on-board graphics device will be present and enabled.**

Security

Table 23. Security

Option	Description
Strong Password	This option lets you enable or disable strong passwords for the system. The option is disabled by default.
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 enabled 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)
Absolute	This field lets you Enable, Disable or Permanently Disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software. · **Enabled** (default) · 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	· Disabled · **Enabled** (default) · One Time Enable

Option	Description
Admin Setup Lockout	Allows you to prevent users from entering Setup when Admin password is set. 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 24. 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 (i) 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 25. 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

Option	Description
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 26. 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.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. · Disabled · **Enabled**—Default

Power management

Table 27. 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 · Power On · Last Power State This option is set to **Power Off** by default.

Option	Description
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 (default)** · Enabled in S5 only · Enabled in S4 and S5
Fan Control Override	The option is not set 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 selected 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 set to **Disabled** by default.
Block Sleep	Allows you to block entering to sleep (S3 state) in OS environment. This option is disabled by default.

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: · 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.

Option	Description
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 29. Manageability

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

Virtualization support

Table 30. 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.

Wireless options

Table 31. 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 32. 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.

Option	Description
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.
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.
First Power On Date	Allows you the set Ownership date. The option **Set Ownership Date** is not set by default.

System logs

Table 33. System Logs

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

Advanced configuration

Table 34. 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.

(i) **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.
   (i) **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 re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694**

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: https://www.dell.com/support/article/us/en/19/sln143196/**

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 Return.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename e.g. O9010A12.exe and press Return.
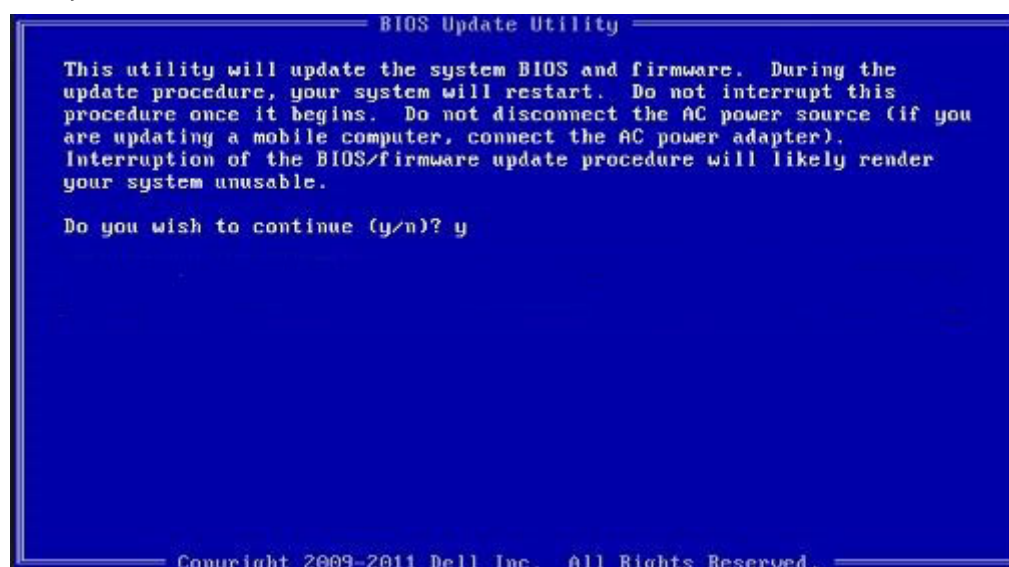8. The BIOS Update Utility will load, follow the instructions on screen.

BIOS Update Utility

This utility will update the system BIOS and firmware. During the update procedure, your system will restart. Do not interrupt this procedure once it begins. Do not disconnect the AC power source (if you are updating a mobile computer, connect the AC power adapter). Interruption of the BIOS/firmware update procedure will likely render your system unusable.

Do you wish to continue (y/n)? y

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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/us/en/19/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 Update using the mouse or arrow keys then press **Enter**.
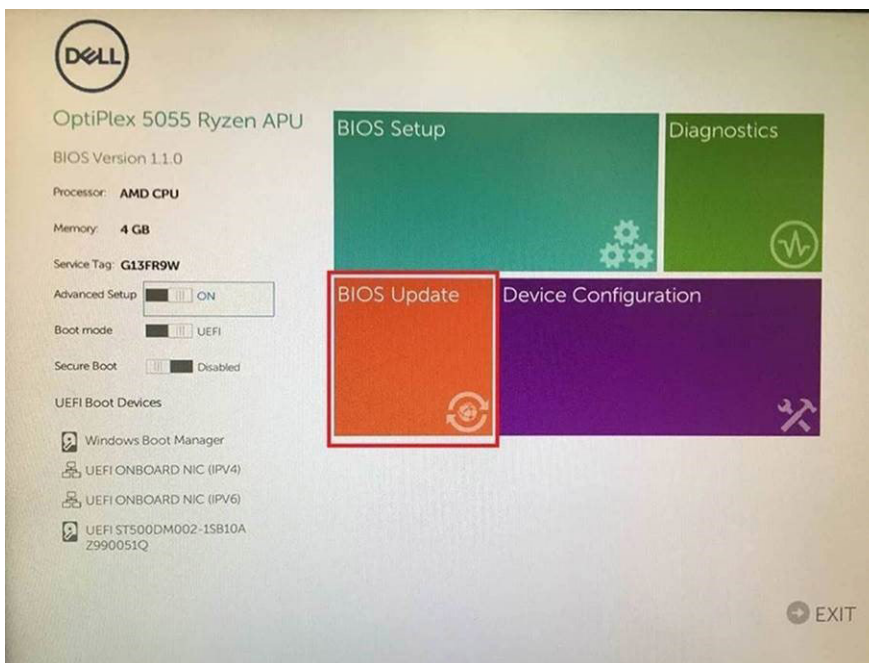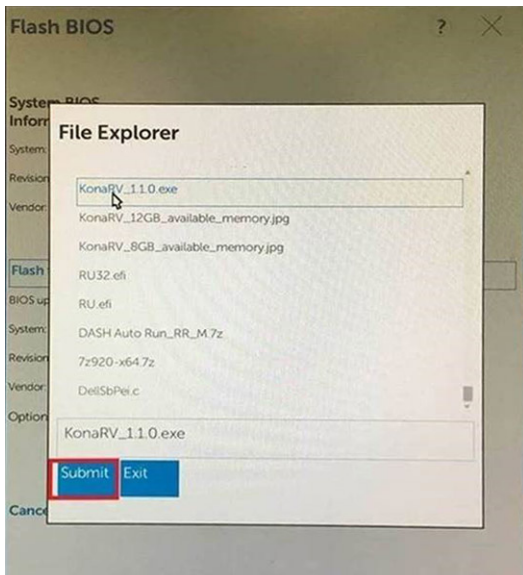

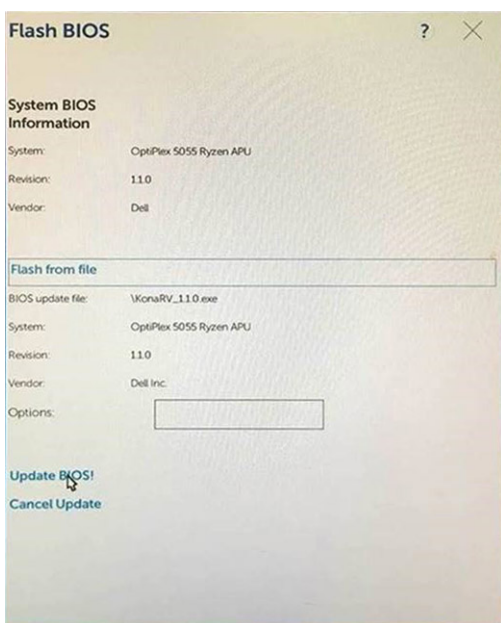3. The Bios flash menu will open then click the **Flash from file**.
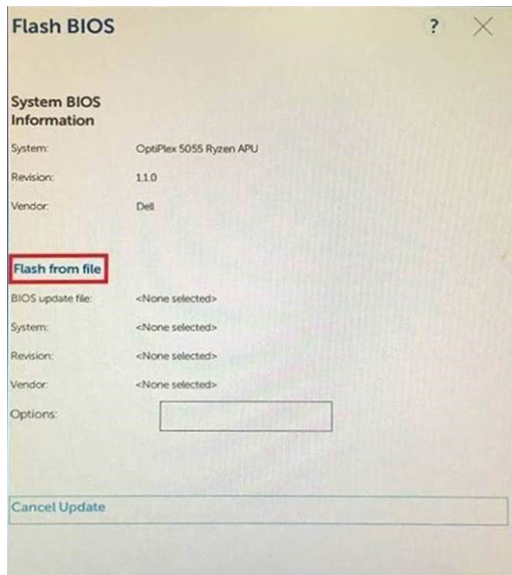
4. Select external USB device
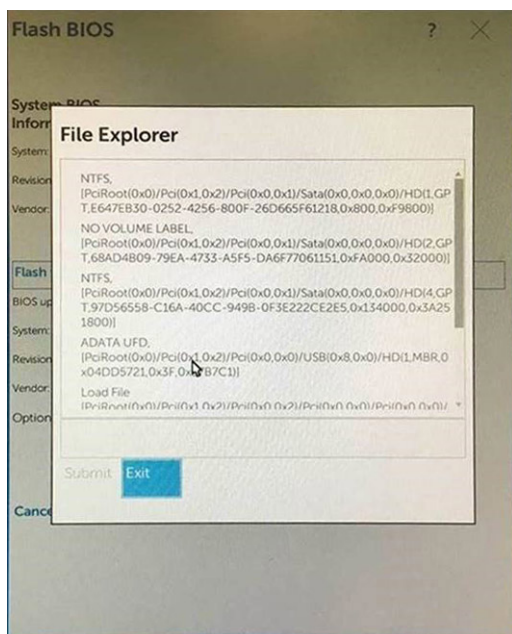
5. Once the file is selected, Double click the flash target file, then press submit .

6. Click the **Update BIOS** then system will reboot to flash the BIOS.

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

System and setup password

Table 35. 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.**

(i) **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 re-boot.

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/or 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.

   (i) **NOTE: If you change the System and/or Setup password, re-enter the new password when prompted. If you delete the System and/or 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 reboot.

Software

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

Topics:

- Downloading drivers

Downloading 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**.

   (i) **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.

System device drivers

Verify if the system device drivers are already installed in the system.

Serial IO driver

Verify if the drivers for Touchpad, IR camera, and keyboard and are installed.
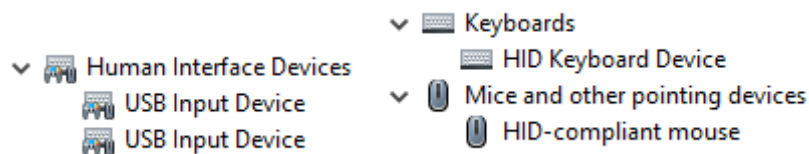
Figure 2. Serial IO driver

Security drivers

Verify if the security drivers are already installed in the system.
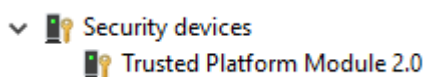
USB drivers

Verify if the USB drivers are already installed in the computer.

```
  ∨  🔌 Universal Serial Bus controllers
       🔌 Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
       🔌 USB Root Hub (USB 3.0)
```

Network adapter drivers

Verify if the Network adapter drivers are already installed in the system.

Realtek Audio

Verify if audio drivers are already installed in the computer.

```
  ∨  🔊 Sound, video and game controllers
       🔊 Intel(R) Display Audio
       🔊 Realtek Audio
```

Storage controller

Verify if the storage control drivers are already installed in the system.

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.