

### Overview

**Important Note:** Features and Supported Configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W Processors and the Z4 G4 Workstation with Intel® Core™ X Processors. Where different – features are shown side by side. Supported configurations are indicated by the CPU Support references.

### HP Z4 G4 Workstation

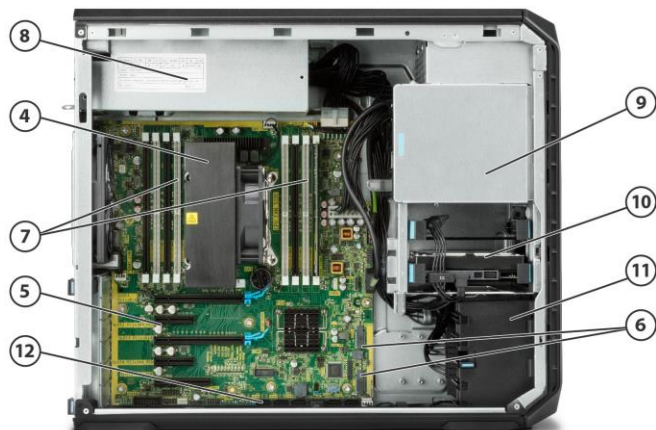


#### Front view

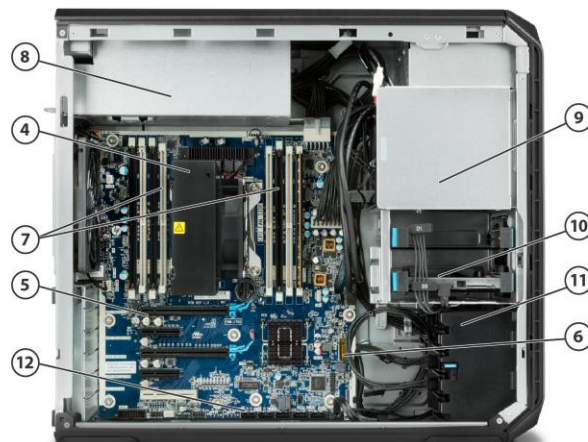
1. Front I/O module options
  - Premium (optional): power button, 2 USB 3.1 G1 Type-A, 2 USB 3.1 G2 Type-C™, Headset audio, SD Card Reader (optional) (Left-most Type-A port has charging capability)
  - Standard (shown here): power button, 4 USB 3.1 G1 Type-A (left-most Type-A port has charging capability), Headset audio, SD Card Reader (optional)
2. Front handle
3. 2 x 5.25" external drive bays

### Overview

#### Intel® Xeon® W Processors



#### Intel® Core™ X-series Processors



### Internal view

#### Intel® Xeon® W Processors

4. Intel® Xeon® Processors: W-2100 family
5. 2 PCIe G3 x16, 2 PCIe G3 x4, 1 PCIe G3 x8
6. 2 PCIe G3 x4 M.2 for SSDs
7. 8 DIMM slots; DDR4-2666 ECC Registered RAM
8. PSU options:
  - 465W 90% efficient with 0 graphics power adapters
  - 750W 90% efficient with 2 graphics power adapters
  - 1000W 90% efficient with up to 4 graphics power Adapters
9. 2 x 5.25" external drive bays
10. 2 x 2.5"/3.5" internal drive bays
11. Front card guide and fan (select configurations)
12. 6 x 6Gb/s SATA ports

#### Intel® Core™ X-series Processors

4. Intel® Core™ i7-X-series processors  
Intel® Core™ i9-X Series processors  
Intel® Core™ i9 Extreme Edition processor
5. Core i9-X configs: 2 PCIe G3 x16, 2 PCIe G3 x4, 1 PCIe G3 x8  
Core i7-X configs: 1 PCIe G3 x16, 1 PCIe G3 x16 (x8 electrical), 2 PCIe G3 x4, 1 PCIe G3 x8 (mechanical only)
6. 1 PCIe G3 x4 M.2 for SSDs
7. 8 DIMM slots: DDR4-2666 Non-ECC Unbuffered RAM
8. PSU:
  - 1000W 90% efficient with up to 4 graphics power Adapters

#### Intel® Xeon® W Processors

#### Intel® Core™ X-series Processors

Overview



Intel® Xeon® W Processors

- 13. Rear I/O (top to bottom):
  - Audio in/out,
  - Keyboard/Mouse PS/2
  - USB: 6 USB 3.1 G1 Type-A
  - 2x 1GbE ports
- 14.
- 15.
- 16.
- 17.
- 18.



Intel® Core™ X-series Processors

- Rear power button
- Rear handle
- Padlock loop
- Kensington lock slot
- 17. Rear I/O (top to bottom):
  - Audio in/out,
  - Keyboard/Mouse PS/2
  - USB: 5 USB 3.1 G1 Type-A
  - 1x 1GbE port
- 18. Side panel barrel keylock (optional)

### Overview

## Overview

### Form Factor Operating Systems

#### Minitower

#### Intel® Xeon® W Processors

##### Preinstalled:

- Windows 10 Pro 64 for Workstations\*
- Windows 10 Downgrade to Windows 7\*\*
- HP Linux-ready (minimal OS ready for customer OS installation)
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1 year support; no preinstalled OS)

##### Supported:

- Red Hat® Enterprise Linux® Desktop 7.4
- SUSE Linux® Enterprise Desktop 12 SP3
- Ubuntu 16.04.3 LTS

#### Intel® Core™ X-series Processors

##### Preinstalled:

- Windows 10 Pro 64\*
- HP Linux-ready (minimal OS ready for customer OS installation)
- Red Hat® Enterprise Linux® Desktop Workstation (Paper license with 1 year support; no preinstalled OS)

##### Supported:

- Red Hat® Enterprise Linux® Desktop 7.4
- SUSE Linux® Enterprise Desktop 12 SP3
- Ubuntu 16.04 LTS

**Notes:** For detailed Linux® OS/hardware support information, see:  
[http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)

\* Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

**Note:** In accordance with Microsoft's support policy, HP does not support the Windows® 8 or Windows® 7 operating system on products configured with Intel® and AMD 7th Generation and forward processors or provide any Windows® 8 or Windows® 7 drivers on <http://www.support.hp.com>

\*\*only available in China through June 2019.

### Available Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MT/s)	ECC memory support	Max memory support	Hyper-Threading	Featuring Intel® vPro™ Technology	Intel® Turbo Boost Technology 2.0 (GHz) <sup>1</sup>	Intel® Turbo Boost Max Technology 3.0 (GHz) <sup>2</sup>	TDP (W)
<b>Intel® Xeon® W Processors</b>											
Intel® Xeon® W-2195 processor	18	2.3	24.75	2666	YES	512GB	YES	YES	3.2, 4.3	N/A	140
Intel® Xeon® W-2175 processor	14	2.5	19.25	2666	YES	512GB	YES	YES	3.3, 4.3	N/A	140
Intel® Xeon® W-2155 processor	10	3.3	13.75	2666	YES	512GB	YES	YES	4.0, 4.5	N/A	140
Intel® Xeon® W-2145 processor	8	3.7	11.00	2666	YES	512GB	YES	YES	4.3, 4.5	N/A	140
Intel® Xeon® W-2135 processor	6	3.7	8.25	2666	YES	512GB	YES	YES	4.4, 4.5	N/A	140
Intel® Xeon® W-2133 processor	6	3.6	8.25	2666	YES	512GB	YES	YES	3.8, 3.9	N/A	140

### Overview

Intel® Xeon® W-2125 processor	4	4.0	8.25	2666	YES	512GB	YES	YES	4.4, 4.5	N/A	120
Intel® Xeon® W-2123 processor	4	3.6	8.25	2666	YES	512GB	YES	YES	3.7, 3.9	N/A	120
Intel® Xeon® W-2104 processor	4	3.2	8.25	2400	YES	512GB	NO	YES	N/A	N/A	120
Intel® Xeon® W-2102 processor	4	2.9	8.25	2400	YES	512GB	NO	YES	N/A	N/A	120
<b>Intel® Core™ X-Series Processors</b>											
Intel® Core™ i9-9980XE processor	18	3.0	24.75	2666	NO	128GB	YES	NO	4.4	4.5	165
Intel® Core™ i9-9920X processor	12	3.5	19.25	2666	NO	128GB	YES	NO	4.4	4.5	165
Intel® Core™ i9-9820X processor	10	3.3	16.5	2666	NO	128GB	YES	NO	4.1	4.2	165
Intel® Core™ i7-9800X processor	8	3.8	16.5	2666	NO	128GB	YES	NO	4.4	4.5	165
Intel® Core™ i9-7980XE processor	18	2.6	24.75	2666	NO	128GB	YES	NO	4.2	4.4	165
Intel® Core™ i9-7960X processor	16	2.8	22.0	2666	NO	128GB	YES	NO	4.2	4.4	165
Intel® Core™ i9-7940X processor	14	3.1	19.25	2666	NO	128GB	YES	NO	4.3	4.4	165
Intel® Core™ i9-7920X processor	12	2.9	16.5	2666	NO	128GB	YES	NO	4.3	4.4	140
Intel® Core™ i9-7900X processor	10	3.3	13.75	2666	NO	128GB	YES	NO	4.3	4.5	140
Intel® Core™ i7-7820X processor	8	3.6	11.0	2666	NO	128GB	YES	NO	4.3	4.5	140
Intel® Core™ i7-7800X processor	6	3.5	8.25	2400	NO	128GB	YES	NO	4.0	N/A	140
<p><sup>1</sup>For Intel® Xeon® W processors, the specifications shown in this column represent the following: all core maximum turbo frequency, single core maximum turbo frequency).</p> <p>For Intel® Core™ processors, the specifications shown in this column refer to single core maximum turbo frequency.</p> <p><sup>2</sup>Intel Turbo Boost Max Technology 3.0 identifies the best performing core(s) on a processor and provides increased performance on those cores by taking advantage of power and thermal headroom. Intel® Turbo Boost Max Technology 3.0 frequency is the clock frequency of the CPU when running in this mode.</p> <p><b>NOTE:</b> Processors that do not have certain turbo functionality are denoted as N/A.</p>											

### Available Processors

#### Disclaimers

Multicore is designed to improve performance of certain software products. Not all customers or software applications will necessarily benefit from use of this technology. Performance and clock frequency will vary depending on application workload and your hardware and software configurations. Intel's numbering, branding and/or naming is not a measurement of higher performance.

#### Color

Black

#### Convertibility

No

### Intel® Xeon® W Processors

### Intel® Core™ X-series Processors

### Overview

#### Expansion Slots (see system board section for more details)

**Slot 0:** Mechanical-only, for use with devices that require only rear bulkhead mounting

**Slot 1:** PCI Express Gen3 x16 (from CPU)

**Slot 2:** PCI Express Gen3 x4 (from PCH) with open-ended connector\*

**Slot 3:**  
PCI Express Gen3 x16 (from CPU)

**Slot 3:**  
Core i9-X configs: PCI Express Gen3 x16 (from CPU)  
Core i7-X configs: PCI Express Gen3 x16(mechanical) x8(electrical) (from CPU)

**Slot 4:** PCI Express Gen3 x4 (from PCH) with open-ended connector\*

**Slot 5:**  
PCI Express Gen3 x8 (from CPU) with open-ended connector\*

**Slot 5:**  
- Core i9-X configs: PCI Express Gen3 x8 (from CPU) with open-ended connector\*  
- Core i7-X configs: PCI Express Gen3 x8 (mechanical-only, no data) with open-ended connector\*

**M.2 Slot 1:** M.2 PCIe Gen 3 x4 (from CPU) up to 80mm storage devices

**M.2 Slot 2:**

M.2 PCIe Gen 3 x4 (from CPU) up to 80mm storage devices

**M.2 Slot 2:**

No 2nd M.2 connector/slot available

\* Open-ended connector allows a greater bandwidth (e.g. x16) card to be installed physically into a lower bandwidth connector/slot.

#### Expansion Bays (see storage section for more details)

2 internal 3.5" bays (with acoustic dampening drive carriers pre-installed). Optional 2.5" adapter available.

2 external 5.25" bays

- 3rd and 4th 3.5" HDD each occupy one external bay
- 3rd and 4th 2.5" HDD/SSD occupy a single external bay within a 2:1 carrier

#### Front I/O

- Base: Power button with power/fault LED, 1 Headset audio port, 4 USB 3.1 G1 Type A (1 charging)
- Premium (optional): Power button with power/fault LED, Drive activity LED, 1 Headset audio port, 2 USB 3.1 G1 Type-A (1 charging), 2 USB 3.1 G2 Type-C™
- Optional: SD reader

#### Internal I/O

1 USB 3.1 G1 single-port header, 1 USB 2.0 single-port header and 1 USB 2.0 dual-port header

#### Rear I/O

**Intel® Xeon® W Processor Family**

6x USB 3.1 G1 Type-A  
2x 1GbE LAN ports (1x supporting Intel AMT)

**Intel® Core™ X- Series Processor Family**

5x USB 3.1 G1 Type-A  
1x 1GbE LAN ports

Audio: 1 Line out, 1 Line in (Line in can be retasked as microphone), 1 PS/2 mouse port, 1 PS/2 keyboard port, 1 Rear power button

Optional: 1 serial port (cable up to rear bulkhead), 2 Thunderbolt 3

#### Interfaces Supported

SD card reader (optional)

6-channel SATA interface (6 @ 6.0 Gb/s)

6 channels are eSATA configurable for use with eSATA CTO/AMO Kit (No hot plug / hot swap supported)

Thunderbolt 3 (optional)

USB 2.0, USB 3.1 G1 (aka USB 3.0), USB 3.1 G2 (optional)

#### On-board RAID Support

SATA RAID 0 Striped Array Configuration

SATA RAID 1 Mirrored Array Configuration

SATA RAID 10 Striped/Mirrored Configuration





### Overview

<b>Chassis Dimensions (H x W x D)</b>	H: 15.2" (386mm) W: 6.65" (169mm) D: 17.5" (445mm)
<b>Packaged Dimensions</b>	H: 22.5" (572mm) W: 12.4" (314mm) D: 22.2" (563mm)
<b>Rack Dimensions</b>	4U
<b>Weight</b>	Exact weights depend upon configuration (System weight only). Minimum: 10.2 kg (22.4 lbs.) Standard: 11.3 kg (24.9 lbs.) Maximum: 17.3 kg (38.2 lbs.)
<b>Temperature</b>	Non-operating: -40° to 60° C (-40° to 140° F) Operating: 5° to 35° C (40° to 95° F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Maximum rate of change: 10 °C/hr No direct sustained sunlight
<b>Humidity</b>	Operating: 10% to 85% relative humidity, non-condensing, 35° C maximum wet bulb Non-operating: 10% to 90% relative humidity, non-condensing, 35° C maximum wet bulb
<b>Maximum Altitude (non-pressurized)</b>	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
<b>Power Supply</b>	<p><b>Processor Support</b></p> <p><b>XW ENTRY</b> 465 watts wide-ranging, active Power Factor Correction, 90% Efficient, with no 6-pin graphics power cables. The Z4 G4 465W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf</a></p> <p><b>XW MID_RANGE</b> 750 watts wide-ranging, active Power Factor Correction, 90% Efficient, with 2x 6-pin graphics power cables. The Z4 G4 750W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf</a></p> <p><b>HIGH-END</b> <b>XW, CX (i9) CX (i7)</b> 1000 watts wide-ranging, active Power Factor Correction, 90% Efficient. Includes 4x 6+2-pin graphics power cables; also includes a Front Fan and Card Guide kit to enable support for dual high end graphics solutions.</p> <p>Includes 2x 6+2-pin graphics power cables.</p> <p>The Z4 G4 1000W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf">https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf</a></p> <p><b>NOTE:</b> 1000 W internal power supply, up to 90% efficiency, active PFC available the first half of 2018</p>

### Overview

#### Workstation ISV Certifications

See the latest list of certifications at  
<http://www8.hp.com/us/en/campaigns/workstations/industries-and-partners.html>

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### Supported Components

#### Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>Intel® Xeon® W-2100 Series CPU</b>				
Intel® Xeon® W-2195 2.3 2666 18C CPU	Y	N		
Intel® Xeon® W-2175 2.5 2666 14C CPU	Y	N		
Intel® Xeon® W-2155 3.3 2666 10C CPU	Y	N		
Intel® Xeon® W-2145 3.7 2666 8C CPU	Y	N		
Intel® Xeon® W-2135 3.7 2666 6C CPU	Y	N		
Intel® Xeon® W-2133 3.6 2666 6C CPU	Y	N		
Intel® Xeon® W-2125 4.0 2666 4C CPU	Y	N		
Intel® Xeon® W-2123 3.6 2666 4C CPU	Y	N		
Intel® Xeon® W-2104 3.2 2400 4C CPU	Y	N		
Intel® Xeon® W-2102 2.9 2400 4C CPU	Y	N		
<b>Intel® Core™ X-Series CPU</b>				
Intel® Core™ i9-9980XE 3.0 2666 18C CPU	Y	N		
Intel® Core™ i9-9920X 3.5 2666 12C CPU	Y	N		
Intel® Core™ i9-9820X 3.3 2666 10C CPU	Y	N		
Intel® Core™ i7-9800X 3.8 2666 8C CPU	Y	N		
Intel® Core™ i9-7980XE 2.6 2666 18C CPU	Y	N		
Intel® Core™ i9-7960X 2.8 2666 16C CPU	Y	N		
Intel® Core™ i9-7940X 3.1 2666 14C CPU	Y	N		
Intel® Core™ i9-7920X 2.9 2666 12C CPU	Y	N		
Intel® Core™ i9-7900X 3.3 2666 10C CPU	Y	N		
Intel® Core™ i7-7820X 3.6 2666 8C CPU	Y	N		
Intel® Core™ i7-7800X 3.5 2400 6C CPU	Y	N		

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#### Monitors / Displays

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Z Display Z22n G2	XW, CX		Y	1JS05AA	
HP Z Display Z23n G2	XW, CX		Y	1JS06AA	
HP Z Display Z24i G2	XW, CX		Y	1JS08AA	
HP Z Display Z24n G2	XW, CX		Y	1JS09AA	
HP Z Display Z24nf G2	XW, CX		Y	1JS07AA	
HP Z Display Z27n G2	XW, CX		Y	1JS10AA	
HP Z Display Z27s (4K display)	XW, CX		Y	J3G07AA	

Supported by all operating systems available from HP

### Supported Components

Screen size measured diagonally

### Storage / Hard Drives\*

#### SAS Hard Drives

SAS Hard Drives for HP Workstations	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 300GB 15k SAS SFF	XW	Y	Y	L5B74AA	
<b>NOTE: Only available on Xeon W configs</b> SAS controller add-in card required					

\*For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity may be less. Up to 32GB (for Windows 10) is reserved for system recovery software.

#### SATA Hard Drives

SATA (Serial ATA) Hard Drives for HP Workstations	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
500GB SATA 7200RPM 6Gb/s 3.5" HDD	XW, CX	Y	Y	LQ036AA	
500GB SATA 7200RPM 6Gb/s OPAL2 SFF 3.5" HDD	XW, CX	Y	Y	D8N29AA	
1TB SATA 7200RPM 3.5" HDD	XW, CX	Y	Y	LQ037AA	
1TB SATA 7200RPM Ent 3.5" HDD	XW, CX	Y	Y	W0R10AA	
2TB SATA 7200RPM HDD	XW, CX	Y	Y	QB576AA	
4TB SATA 7200RPM Ent 3.5" HDD	XW, CX	Y	Y	K4T76AA	
6TB SATA 7200RPM Ent 3.3" HDD	XW, CX	Y	Y	3DH90AA	
<b>NOTES:</b> Up to (4) 3.5-inch 7200 rpm SATA drives: 500 GB, 1.0, 2.0, 4.0, 16TB max total					

#### SATA Solid State Drives

HP Solid State Drives (SSDs) for Workstations	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 256GB SATA SSD	XW, CX	Y	Y	A3D26AA	
HP 512GB SATA SSD	XW, CX	Y	Y	D8F30AA	
HP 1TB SATA SSD	XW, CX	Y	Y	F3C96AA	
HP 2TB SATA SSD	XW, CX	Y	Y	Y6P08AA	
HP 256GB SATA SED OPAL2 SSD	XW, CX	Y	Y	G7U67AA	
HP 512GB SATA SED OPAL2 SSD	XW, CX	Y	Y	N8T26AA	
HP 240GB SATA Enterprise SSD	XW, CX	Y	Y	T3U07AA	
HP 480GB SATA Enterprise SSD	XW, CX	Y	Y	T3U08AA	

### Supported Components

#### PCIe Solid State Drives

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>PCIe SSDs for HP Workstations</b>					
HP Z Turbo Drive 256GB MLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD56AA	
HP Z Turbo Drive 512GB MLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD57AA/AT	
HP Z Turbo Drive 1TB MLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD58AA	
HP Z Turbo Drive 256GB TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD59AA/AT	
HP Z Turbo Drive 512GB TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD60AA	
HP Z Turbo Drive 1TB TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	1PD61AA	
HP Z Turbo Drive 2TB TLC Z4/Z6 G4 SSD Kit	XW, CX	Y	Y	TBD	
HP Z Turbo Drive 256GB Z4/Z6 G4 SED Kit	XW, CX	Y	Y	4YZ41AA	
HP Z Turbo Drive 512GB Z4/Z6 G4 SED Kit	XW, CX	Y	Y	4YZ44AA/AT	
<b>HP Z Turbo Drive Quad Pro</b>					
HP Z Turbo Drive Quad Pro 2x256GB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ38AA	1, 4
HP Z Turbo Drive Quad Pro 2x512GB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ39AA/AT	1, 4
HP Z Turbo Drive Quad Pro 2x1TB TLC PCIe® SSD	XW, CX (i9)	Y	Y	4YZ40AA	1, 4
HP Z Turbo Drive Quad Pro 2x2TB PCIe® SSD	XW, CX (i9)	Y	Y	3KP42AA	
HP Z Turbo Drive Quad Pro 256GB TLC SSD module	XW, CX (i9)	N	Y	4YZ35AA	1, 3, 4
HP Z Turbo Drive Quad Pro 512GB TLC SSD module	XW, CX (i9)	N	Y	4YZ36AA/AT	1, 3, 4
HP Z Turbo Drive Quad Pro 1TB TLC SSD module	XW, CX (i9)	N	Y	4YZ37AA	1, 3, 4
HP Z Turbo Drive Quad Pro 2TB TLC SSD module	XW, CX (i9)	N	Y	3KP43AA	
<b>HP Z Turbo Drive Dual Pro</b>					
HP Z Turbo Drive Dual Pro 256GB TLC SSD		Y	Y	4YF60AA	
HP Z Turbo Drive Dual Pro 512GB TLC SSD		Y	Y	4YF61AA	
HP Z Turbo Drive Dual Pro 1TB TLC SSD		Y	Y	4YF62AA	
HP Z Turbo Drive Dual Pro 2TB TLC SSD		Y	Y	4YF63AA	
<b>Intel® 905p Series SSD (Optane SSD)</b>					
Intel® Optane SSD 905p 280GB AiC***		Y	Y	2SC47AA	
Intel® Optane SSD 905p 480GB AiC***		Y	Y	2SC48AA	

**Note 1:** All HP Z Turbo Drive Quad Pro modules require the Z4 G4 Fan & Front Card Kit, available as CTO (1MY89AV) and AMO (1XM33AA)

**Note 3:** M.2 SSD module only, designed to be installed into the Z Turbo Drive Quad Pro or Dual Pro carrier

**Note 4:** Z Turbo Drive Quad Pro is not supported on Core i7-X configurations

\*\* PCIe card installed in standard PCIe x4 slot

\*\*\* Intel® Optane SSD Available Fall 2018

### Supported Components

#### Hard Drive Controllers

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>SAS Controller</b>					
MicroSemi SmartHBA2100-4i4e SAS Controller	XW	Y	Y	1FV90AA	
<b>NOTE:</b> Only available on Xeon W configurations					

### Graphics

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported # of cards
<b>Graphics Cable Adapters</b>						
HP DisplayPort to HDMI Adapter	XW, CX	Y	Y	K2K92AA		
HP DisplayPort to Dual Link DVI Adapter	XW, CX	Y	Y	NR078AA		
HP DisplayPort to DVI-D Adapter	XW, CX	Y	Y	FH973AA		
HP DisplayPort to DVI-D Adapter (2-pack)	XW, CX	Y	N			
HP DisplayPort to DVI-D Adapter (4-pack)	XW, CX	Y	N			
HP DisplayPort to DVI-D Adapter (6-pack)	XW, CX	Y	N			
HP miniDP-to-DP Adapter	XW, CX	Y	Y	2MY05AA		
HP miniDP-to-DP Adapter (2-pack)	XW, CX	Y	N			
HP miniDP-to-DP Adapter (4-pack)	XW, CX	Y	N			
HP miniDP-to-DP Adapter (8-pack)	XW, CX	Y	N			
NVIDIA SLI 2-slot Graphics Connector	XW, CX	Y	Y	2YY84AA		
<b>Entry 3D</b>						
NVIDIA® Quadro® P400 2GB Graphics	XW, CX	Y	Y	1ME43AA/AT	4	2
NVIDIA® Quadro® P600 1st GFX 2GB Graphics	XW, CX	Y	Y	1ME42AA/AT	4	2
NVIDIA® Quadro® P620 2GB Graphics	XW, CX	Y	Y	3ME25AA	4	2
AMD FirePro™ W2100 2GB Graphics	XW, CX	Y	Y	J3G91AA/AT	3	2
<b>Mid-range 3D</b>						
NVIDIA® Quadro® P1000 1st GFX 4GB Graphics	XW, CX	Y	Y	1ME01AA/AT	3, 4	2
NVIDIA® Quadro® P2000 1st GFX 5GB Graphics	XW, CX	Y	Y	1ME41AA/AT	3, 4	2
AMD Radeon™ Pro WX 3100 4GB Graphics	XW, CX	Y	Y	2TF08AA	3, 4	2
AMD Radeon™ Pro WX 4100 4GB Graphics	XW, CX	N	Y	Z0B15AA/AT	3, 4	2
<b>High End 3D</b>						
NVIDIA® Quadro® P4000 1st GFX 8GB Graphics	XW, CX	Y	Y	1ME40AA/AT	1, 2, 5	2
NVIDIA® Quadro® P5000 1st GFX 16GB Graphics	XW, CX	Y	Y	Z0B13AA/AT	1, 2, 5	2
NVIDIA® Quadro® P6000 1st GFX 24GB Graphics	XW, CX	Y	Y	Z0B12AA/AT	1, 2, 5	2
NVIDIA® Quadro® GP100 16GB Graphics	XW, CX	Y		1ZE81AA/AT	1, 2, 5	2
NVIDIA® Quadro® GV100 32GB Graphics	XW, CX	Y		3ME26AA/AT	1, 2, 5	2
NVIDIA® Quadro® RTX 5000 16GB Graphics	XW, CX	Y	Y	5JH81AA	1, 2	1
NVIDIA® Quadro® RTX6000 24GB Graphics	XW, CX	Y	Y	5JH80AA	1, 2	1
AMD Radeon™ Pro WX 7100 1st GFX 8GB Graphics	XW, CX	Y	Y	Z0B14AA/AT	1, 2	2
AMD Radeon™ Pro WX 9100 16GB Graphics	XW, CX	Y		2TF01AA/AT	1, 2	1
NVIDIA® Quadro® Sync II	XW, CX	Y	Y	1WT20AA		

### Supported Components

**NOTE 1:** Single graphics configuration requires the HP Z4 G4 Fan and Front Card Guide Kit, which is available both CTO (1MY89AV) and AMO (1XM33AA).

**NOTE 2:** Single graphics configuration requires the 750W chassis or 1000W chassis.

**NOTE 3:** Dual graphics configuration requires the HP Z4 G4 Fan and Front Card Guide Kit, which is available both CTO (1MY89AV) and AMO (1XM33AA).

**NOTE 4:** Dual graphics configuration requires the 750W chassis or 1000W chassis.

**NOTE 5:** Dual graphics configuration requires the 1000W chassis.

Memory	CTO	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
DDR4-2666 ECC Registered DIMMs						
HP 8GB (1x8GB) DDR4-2666 ECC Reg RAM	XW	Y	Y	1XD84AA/AT	1	
HP 16GB (2x8GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
HP 24GB (3x8GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
32GB (4x8GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
64GB (8x8GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
16GB (1x16GB) DDR4-2666 ECC Reg RAM	XW	Y	Y	1XD85AA/AT	1	
32GB (2x16GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
64GB (4x16GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
128GB (8x16GB) DDR4-2666 ECC Reg RAM	XW	Y			1	
32GB (1x32GB) DDR4-2666 ECC Reg RAM	XW	N	Y	1XD86AA/AT	1, 2	
64GB (2x32GB) DDR4-2666 ECC Reg RAM	XW	Y			1, 2	
128GB (4x32GB) DDR4-2666 ECC Reg RAM	XW	Y			1, 2	
256GB (8x32GB) DDR4-2666 ECC Reg RAM	XW	Y			1, 2	
HP 8GB (1x8GB) DDR4-2666 nECC RAM	CX	Y	Y	3PL81AA	1	
HP 16GB (2x8GB) DDR4-2666 nECC RAM	CX	Y			1	
HP 32GB (4x8GB) DDR4-2666 nECC RAM	CX	Y			1	
HP 64GB (8x8GB) DDR4-2666 nECC RAM	CX	Y			1	
HP 16GB (1x16GB) DDR4-2666 nECC RAM	CX	Y	Y	3PL82AA	1	
HP 32GB (2x16GB) DDR4-2666 nECC RAM	CX	Y			1	
HP 64GB (4x16GB) DDR4-2666 nECC RAM	CX	Y			1	
HP 128GB (8x16GB) DDR4-2666 nECC RAM	CX	Y			1	

#### NOTES:

For details on the supported memory configurations on the HP Z4 G4 Workstation, please refer to the System Technical Specifications - System Board section of this document.

Each processor supports up to 4 channels of DDR4 memory. To realize full performance at least 1 DIMM must be inserted into each channel.

The CPUs determine the speed at which the memory is clocked. If an 2400MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2400MT/s, regardless of the specified speed of the memory.

**NOTE 1:** ONLY DDR4 DIMMs are supported.

### Supported Components

**NOTE 2** Memory configurations using 32GB DIMMs require the HP Z4 Memory Cooling Solution, which is available both CTO (1MY90AV) and AMO (1XM34AA).

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### Multimedia and Audio Devices

### Supported Components

#### Multimedia and Audio Devices

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Integrated Realtek HD ALC221 Audio	XW, CX	Y	N		

#### Optical and Removable Storage

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
<b>HP SlimTray Optical Drives</b>					
HP 9.5mm Slim Blu Ray Disc Writer	XW, CX	Y	Y	K3R65AA	1
HP 9.5mm Slim DVD ROM	XW, CX	Y	Y	K3R63AA	1
HP 9.5mm Slim DVD Writer*	XW, CX	Y	Y	K3R64AA	1
HP HH DVD Writer (16x RW DVD-R)	XW, CX	Y	Y	4AR67AA	
<b>HP SD Card Reader</b>					
HP SD 4 Card Reader	XW, CX	Y	Y	Y0L99AA	

**NOTE 1:** Installing an optical drive into Z4 G4 requires a 5.25" external bay adapter (Option Kit Part number NQ099A).

\*Actual speeds may vary. No support for DVD-RAM (DVD Writer). Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses. Double Layer discs can store more data than single layer discs. However, double-layer discs burned with this drive may not be compatible with many existing single-layer DVD drives and players.

With Blu-ray, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.

#### Networking and Communications

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel® i350-T2 PCIe Dual Port Gigabit NIC	XW, CX	Y	Y	V4A91AA	
Intel® i350-T4 PCIe 4-Port Gigabit NIC	XW, CX	N	Y	W8X25AA	
Intel® Ethernet I210-T1 PCIe x1 Gb NIC	XW, CX	Y	Y	E0X95AA	
Aquantia® AQN-108 Single-Port 5GbE NIC	XW, CX	N	Y	1PM63AA	
Intel® X550-T2 10GbE Dual Port NIC	XW, CX	Y	Y	1QL46AA	
Intel® X710-DA2 10GbE SFP+ Dual Port NIC	XW, CX	Y	Y	1QL47AA	1
HP 10GbE SFP+ SR Transceiver	XW, CX	Y	Y	C3N53AA	
Intel 8265 802.11 a/b/g/n/ac + BT PCIe WLAN	XW, CX	N	Y	1QL48AA	

**Note 1:** Windows 7 is NOT supported

#### Racking and Physical Security



### Supported Components

#### Racking and Physical Security

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Z4/Z6 Side Panel Barrel Keylock	XW, CX	Y	N		
HP Solenoid Lock / Hood Sensor	XW, CX	Y	N		
HP Z4/Z6 Depth Adjustable Fixed Rail Rack Kit	XW, CX	N	Y	2HW42AA	
HP Keyed Cable Lock 10mm	XW, CX	N	Y	T1A62AA	

#### Input Devices

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Wireless Business Slim Keyboard and Mouse	XW, CX	Y	Y	N3R88AA	
Business Slim PS/2 Wired Keyboard	XW, CX	Y	Y	N3R86AA	
USB Business Slim Wired Keyboard	XW, CX	Y	Y	N3R87AA	
USB Premium Wired Keyboard	XW, CX	Y	Y	Z9N40AA/AT	
USB Wired SmartCard CCID Keyboard	XW, CX	Y	Y	E6D77AA	
3Dconnexion CADMouse	XW, CX	Y	Y	M5C35AA	
HP Optical USB Mouse	XW, CX	Y	Y	QY777AA/AT	
HP PS/2 Mouse	XW, CX	Y	Y	QY775AA/AT	
HP USB Hardened Mouse	XW, CX	Y	Y	P1N77AA/AT	

#### Other Hardware

	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP ENERGY STAR® Certified Configuration	XW, CX	Y			
HP Z Premium Front I/O 2xUSB-A 2xUSB-C	XW, CX	Y	Y	1XM32AA	
HP Thunderbolt 3 PCIe 2 Port I/O Card	XW, CX	Y	Y	3UU05AA	
HP Z4 G4 Memory Cooling Solution	XW, CX	Y	Y	1XM34AA	Note 1
HP Z4 G4 Fan and Front Card Guide Kit	XW, CX	Y	Y	1XM33AA	Note 2
HP Internal USB Port Kit	XW, CX	N	Y	EM165AA	Note 3
HP eSATA 2 port PCIe Bulkhead Kit	XW, CX	Y	Y	GM110AA	
HP Serial Port Adapter	XW, CX	Y	Y	PA716A	
HP Workstation Mouse Pad	XW, CX	Y			

**Note 1:** The HP Z4 G4 Memory Cooling Solution is available to add to any configuration for improved system cooling, but is required for memory configurations using 32GB DIMMs.

**Note 2:** Fan and Front Card Guide required with the following components:  
 - Specific graphics configurations (see Graphics section above)  
 - Any HP Z Turbo Quad Pro configuration

**Note 3:** The HP Internal USB Port kit has a single USB 2.0 type A connector.

### Supported Components

Software	Processor Supports	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Sobey Video Editing SW	XW, CX	Y	N		China only
SW HP RGS for Z	XW, CX	Y	N		
HP Sure Start Gen3	XW, CX	Y	N		1
<b>Note 1:</b> Available on products equipped with Intel® 7th generation processors.					

### Supported Components

#### Operating Systems

	Processor Supports	Support Notes
Windows 10 Pro 64 for Workstations	XW	Note 1
Windows 10 Pro 64	CX	Note 2
Windows 7 Professional 64-bit	XW	Note 3
Windows 10 Downgrade to Windows 7*	XW	
HP Linux® Ready	XW, CX	Note 4
Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr)	XW, CX	Note 5
*only available in China through June 2019.		

**NOTE 1:** Only applicable to Xeon W configurations

**NOTE 2:** Only applicable to Core X configurations

**NOTE 3:** downgrade media available from HP Support. Not supported or available for Core X configurations. For detailed Windows 7 OS hardware support information see <http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf>.

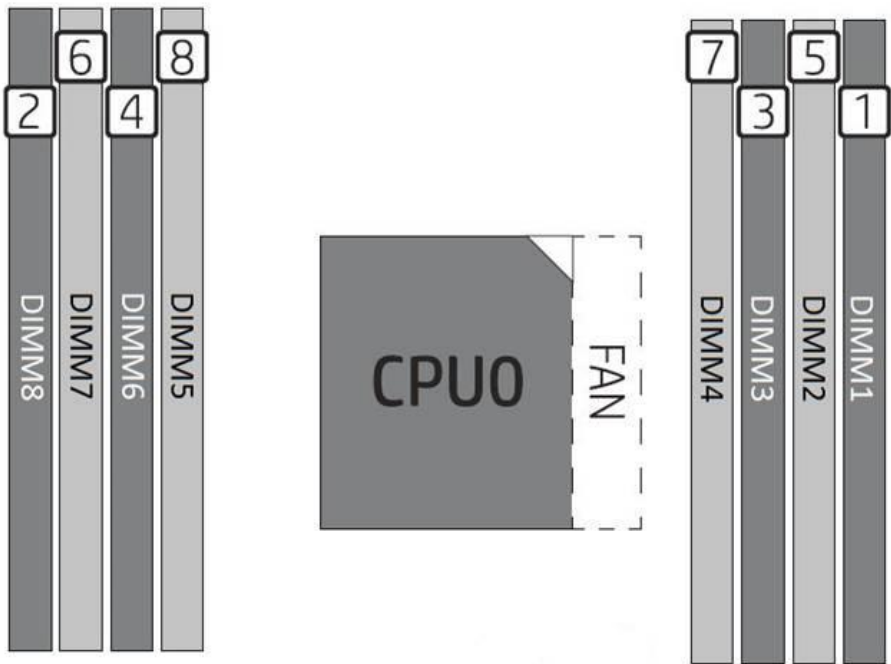
**NOTE 4:** includes drivers for 64-bit OS versions of RHEL 6 & 7, SUSE Linux® Enterprise Desktop 11 and Ubuntu 14.04. For detailed Linux® OS/hardware support information, see: [http://www.hp.com/support/linux\\_hardware\\_matrix](http://www.hp.com/support/linux_hardware_matrix)

**NOTE 5:** This second OS must be ordered with the HP Linux® Installer Kit as the first OS.

System Technical Specifications

System Board

System Board Form Factor	Main System Board: 27.7 x 28.0 cm 10.9 x 11.0 inches Single LGA2066 R4	
Processor Socket	Intel® Xeon® W Processor Family	Intel® Core™ X-series Processors
Chipset	Intel® C422 Chipset	Intel® X299 chipset
Super I/O Controller	Nuvoton NPCD315HA0DX (SIO-15)	
Memory Expansion Slots	8 DDR4 memory slots	
Memory Type Supported	DDR4, RDIMM (Registered), ECC: 8GB, 16GB and 32GB	DDR4, UDIMM, non-ECC: 8GB and 16GB
Memory Modes Supported	Channel Interleaved	
Memory Speed Supported	2666MT/s, 2400MT/s, and 2133MT/s	
Memory Protection	ECC available on data, parity on address and command	N/A
Maximum Memory	Supports up to 256GB	Supports up to 128GB
Memory Configuration (Supported)	Only Registered DIMMs are supported.	Only non-ECC unbuffered DIMMs are supported
Memory Load Order		



**Note on Maximum Memory** Maximum memory capacities assume 64-bit operating systems such as Windows 10 Pro 64-bit, Windows 7 Professional 64-bit.

### System Technical Specifications

For systems installed with Microsoft Windows 7 (Ultimate, Enterprise or Pro), the maximum accessible system memory is 192GB

#### PCI Express Connectors

#### Intel® Xeon® W Processor Family

#### Intel® Core™ X-series Processors

**Slot 1 (top):** PCI Express Gen3 x16 supplied by CPU.

**Slot 2 (PCH):** PCI Express Gen3 x4 supplied by PCH with open-ended connector. \*\*

#### Slot 3:

PCI Express Gen3 x16 supplied by CPU

#### Slot 3:

Core i9-X configs: PCI Express Gen3 x16 supplied by CPU

Core i7-X configs: PCI Express Gen3 x16 (mechanical)/ x8 (electrical) supplied by CPU

**Slot 4 (PCH):** PCI Express Gen3 x4 supplied by PCH with open-ended connector\*\*

#### Slot 5:

PCI Express Gen3 x8 supplied by CPU with open-ended connector\*\*

#### Slot 5:

- Core i9-X configs: PCI Express Gen3 x8 supplied by CPU with open-ended connector\*\*

- Core i7-X configs: PCI Express Gen3 x8 (mechanical-only, no data) with open-ended connector\*\*

**NOTE:** Slots 1 through 5 support full-height, full-length cards (with extender)

**M.2 Slot 1:** PCI Express Gen3 x4 supplied by CPU

Socket Type 3, Key M, H4.2, sizes 2260-D5-M, 2280-D5-M, 22110-D5-M

#### M.2 Slot 2:

PCI Express Gen3 x4 supplied by CPU  
Socket Type 3, Key M, H4.2, sizes 2260-D5-M, 2280-D5-M, 22110-D5-M

#### M.2 Slot 2:

No 2nd M.2 connector/slot available

\*\* Open-ended connector allows a greater bandwidth (e.g. x16) card to be installed physically into a lower bandwidth connector/slot.

### System Technical Specifications

#### Supported Drive Interfaces

<b>SATA</b>	6 SATA @6Gb/s, supports RAID 0,1, 5, and 10 Factory integrated RAID is Microsoft Windows only	
<b>Serial Attached SCSI</b>	<b>Intel® Xeon® W Processor Family</b> Requires Optional PCIe card	<b>Intel® Core™ X-series Processors</b> not supported
<b>Factory Configured RAID</b>	<ul style="list-style-type: none"> <li>• RAID 0 configuration - striped array</li> <li>• RAID 1 configuration - mirrored array</li> <li>• RAID 10 striped and mirrored array</li> </ul> <p>*HW RAID functionality not supported by Linux®. Use SW RAID functionality provided in the Red Hat® Operating system instead.</p>	

#### Integrated Graphics

No

#### Network Controller

<b>Intel® Xeon® W Processor Family</b> Intel® I219-LM PCIe GbE LAN Intel® I210-AT PCIe GbE LAN Supports the following management functionalities: Intel AMT11.1x, TXT, DASH 1.1, WOL, VLAN, Teaming and PXE 2.1	<b>Intel® Core™ X-series Processors</b> Intel® I219-V PCIe GbE LAN Supports the following management functionalities: WOL and PXE 2.1
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#### External SATA (eSATA)

Supported on all SATA ports configurable with optional eSATA\* cable kit  
\* hot plug / hot swap not supported with eSATA

#### IDE connector

No

#### Floppy connector

No

#### Serial

1 internal header

#### 2nd Serial

No

#### Parallel

No

#### AUX IN (audio)

No

#### IEEE 1394 Connector(s)

##### Front

None

##### Rear

None

##### Internal

None

#### USB Connector(s)

##### Front

Front USB depends on which FIO module is selected:  
- Standard: 4 USB 3.1 G1 Type A (1 charging)  
- Premium: 2 USB 3.1 G2 Type C™, 2 USB 3.1 G1 Type A (1 charging)

##### Rear

#### Intel® Xeon® W Processor Family

6 USB 3.1 G1 Type A

#### Intel® Core™ X-series Processors

5 USB 3.1 G1 Type-A

##### Internal

1 USB 3.1 G1 single-port header  
1 USB 2.0 single-port header  
1x USB 2.0 dual-port header

### System Technical Specifications

HD Integrated Audio	Realtek ALC221			
Flash ROM	Yes			
CPU Fan Header	Yes			
Rear Chassis Fan Header	Yes			
Front PCI Fan Header	Yes			
Front Control Panel/Speaker Header	Yes			
CMOS Battery Holder - Lithium	Yes			
Integrated Trusted Platform Module	Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670) Common Criteria EAL4+ Certified Convertible to FIPS 140-2 Certified mode through firmware v7.80 TPM Certified products list: <a href="https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/">https://trustedcomputinggroup.org/membership/certification/tpm-certified-products/</a>			
Power Supply Headers	Yes			
Power Switch, Power LED & Hard Drive LED Header	Yes			
Clear Password Jumper	Yes			
Serial Port	1 internal header			
Parallel Port	No			
Keyboard/Mouse	USB or PS/2			
Hood Lock Header	Yes			
Hood Sensor Header	Yes			
Memory Fan	1 Memory Fan Header			
AUX IN (audio)	No			
Power Supply				
Power Supply	750W 90% Efficient, Custom PSU (Wide-Ranging, Active PFC)		465W 90% Efficient, Custom PSU (Wide-Ranging, Active PFC)	
Operating Voltage Range	90–269 VAC		90–269 VAC	
Rated Voltage Range	100–240 VAC	118 VAC	100–240 VAC	118 VAC
Rated Line Frequency	50–60 Hz	400 Hz	50–60 Hz	400 Hz
Operating Line Frequency Range	47–66 Hz	393–407 Hz	47–66 Hz	393–407 Hz
Rated Input Current	100–240V @ 10A	118V @ 10A	100–240V @ 6A	118V @ 6A
Heat Dissipation (Configuration and software dependent)	Typical = 1850 btu/hr Max = 3084 btu/hr		Typical = 1147 btu/hr Max = 1912 btu/hr	
Power Supply Fan	80x25 mm variable speed		80x25 mm variable speed	
ENERGY STAR® Certified (Configuration dependent)	Yes		Yes	
	90% Efficient		90% Efficient	
80 PLUS® Compliant	The Z4 G4 750W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-750AB-36%20A_750W_ECOS%204938_Report.pdf</a>		The Z4 G4 465W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf">https://plugloadsolutions.com/psu_reports/HP%20INC_DPS-465AB-3%20A_465W_ECOS%204939_Report.pdf</a>	



### System Technical Specifications

<b>Power Supply</b>	1000W 90% Efficient, Custom PSU (Wide-Ranging, Active PFC)	
<b>Operating Voltage Range</b>	90–269 VAC	
<b>Rated Voltage Range</b>	100–127 VAC 200–240 VAC	118 VAC
<b>Rated Line Frequency</b>	50–60 Hz	400 Hz
<b>Operating Line Frequency Range</b>	47–66 Hz	393–407 Hz
<b>Rated Input Current</b>	12A @100–127 VAC 6.3A @ 200–240 VAC	12A @ 118VAC
<b>Heat Dissipation (Configuration and software dependent)</b>	Typical = 2467 btu/hr Max = 4112 btu/hr	
<b>Power Supply Fan</b>	80x25 mm variable speed	
<b>ENERGY STAR® Certified (Configuration dependent)</b>	Yes	
<b>80 PLUS® Compliant</b>	90% Efficient	
	The Z4 G4 1000W power supply efficiency report can be found at this link: <a href="https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf">https://plugloadsolutions.com/psu_reports/HP_D15-1K0P1A_1000W_ECOS%204838_Report.pdf</a>	
<b>FEMP Standby Power Compliant @115V &lt;1W in S5 – Power Off)</b>	Yes	Yes
<b>EuP Compliant @ 230V (&lt;0.5 W in S5 – Power Off)</b>	Yes	Yes
<b>CECP Compliant @ 220V (&lt;4W in S3 – Suspend to RAM)</b>	Yes; Configuration dependent	Yes; Configuration dependent
<b>Power Consumption in sleep mode (as defined by ENERGY STAR®) – Suspend to RAM (S3) (Instantly Available PC)</b>	TBD	TBD
<b>Built-in Self Test LED</b>	Yes	Yes
<b>Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)</b>	Yes	Yes

**NOTE:** 1000 W internal power supply, up to 90% efficiency, active PFC available the first half of 2018

### System Technical Specifications

### System Configuration

<b>Example Z4 G4 Workstation Configuration #1</b>  ENERGY STAR® Certified	Processor	1x Intel Xeon W-2102 4C 2.9GHz					
	Memory	1x 8GB DDR4-2666 (Registered DIMM)					
	Graphics	1x NVIDIA Quadro P400					
	Disks / Optical	1x 500GB SATA 7200 ; 1x Slim DVD-ROM SATA					
	Power Supply	465W 90% custom PSU					
	Other	N/A					
	<b>Energy Consumption</b>	115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
		Windows Idle (S0)		42.323		41.338	
		Windows Busy Typ(S0)		TBD		TBD	
		Windows Busy Max (S0)		90.231		92.323	
		Sleep (S3)		3.449		3.440	
		Off (S5)		1.041		1.014	
		Zero Power Mode (ErP)		0.187		0.43	
<b>Heat Dissipation (Btu/hr)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
		Windows Idle (S0)		144.406		141.045	
		Windows Busy Typ(S0)		TBD		TBD	
		Windows Busy Max (S0)		307.868		315.006	
		Sleep (S3)		11.767		11.737	
		Off (S5)		3.551		3.459	
		Zero Power Mode (ErP)		0.638		1.467	

<b>Example Z4 G4 Workstation Configuration #2</b>  ENERGY STAR® Certified	Processor	1x Intel Xeon W-2123 4C 3.6GHz					
	Memory	2x 8GB DDR4-2666 (Registered DIMM)					
	Graphics	1x NVIDIA QuadroP1000					
	Disks / Optical	1x 500GB SATA 7200 ; 1x Slim DVD-ROM SATA					
	Power Supply	750W 90% custom PSU					
	Other	N/A					
	<b>Energy Consumption (Watts)</b>	115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
		Windows Idle (S0)		39.947		39.569	
		Windows Busy Typ(S0)		TBD		TBD	
		Windows Busy Max (S0)		149.543		150.789	
		Sleep (S3)		3.615		3.566	
		Off (S5)		1.079		1.016	
		Zero Power Mode (ErP)		0.204		0.430	
<b>Heat Dissipation</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
		Windows Idle (S0)		39.947		39.569	
		Windows Busy Typ(S0)		TBD		TBD	
		Windows Busy Max (S0)		149.543		150.789	
		Sleep (S3)		3.615		3.566	
		Off (S5)		1.079		1.016	
		Zero Power Mode (ErP)		0.204		0.430	

### System Technical Specifications

(Btu/hr)	Windows Idle (S0)	136.299		135.009		139.741	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	510.241		514.492		504.447	
	Sleep (S3)	12.338	12.167	12.969	12.959	12.399	12.355
	Off (S5)	3.681	3.466	4.913	4.224	4.504	3.992
	Zero Power Mode (ErP)	0.696		1.467		0.651	

<b>Example Z4 G4 Workstation Configuration #3</b>	Processor	1x Intel Xeon W-2133 6C 3.6GHz					
	Memory	4x 8GB DDR4-2666 (Registered DIMM)					
	Graphics	1x NVIDIA QuadroP2000					
	Disks/Optical	2x 1TB SATA7200 ; 1x Slim SuperMulti DVDRW SATA					
	Power Supply	750W 90% custom PSU					
	Other	N/A					

<b>Energy Consumption (Watts)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	48.759		46.321		46.578	
	Windows Busy Typ(S0)	TBD		199.56		206.055	
	Windows Busy Max (S0)	209.60		208.66		198.82	
	Sleep (S3)	4.360	4.351	4.538	4.508	4.299	4.277
	Off (S5)	1.039	1.017	1.42	1.219	1.015	0.997
	Zero Power Mode (ErP)	0.203		0.399		0.191	

<b>Heat Dissipation (Btu/hr)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	166.366		258.047		158.924	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	715.155		711.947		678.373	
	Sleep (S3)	14.876	14.845	15.483	15.381	14.668	14.593
	Off (S5)	3.544	3.470	4.845	4.179	3.463	3.402
	Zero Power Mode (ErP)	0.692		1.361		0.651	

<b>Example Z4 G4 Workstation Configuration #4</b>	Processor	1x Intel Xeon W-2155 10C 3.3GHz					
	Memory	8x 32GB DDR4-2666 (Registered DIMM)					
	Graphics	1x NVIDIA QuadroP6000					
	Disks / Optical	4x 2TB SATA 7200 ; 0x ODD					
	Power Supply	750W 90% custom PSU					
	Other	N/A					

<b>Energy Consumption (Watts)</b>		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	65.959		69.321		68.635	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	463.23		456.95		503.125	

### System Technical Specifications

<b>Heat Dissipation</b> (Btu/hr)	Sleep (S3)	6.336	6.102	6.971	6.189	6.266	6.264
	Off (S5)	1.047	1.036	1.254	1.222	1.014	0.995
	Zero Power Mode (ErP)	0.203		0.399		0.191	
		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	225.052		236.523		234.183	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	1580.541		1559.113		1716.663	
	Sleep (S3)	21.618	20.821	23.785	21.117	21.379	21.372
	Off (S5)	3.572	3.534	4.278	4.169	3.459	3.394
	Zero Power Mode (ErP)	0.692		1.361		0.652	

<b>Example Z4 G4 Workstation Configuration #5</b>	Processor	1x Intel Core i7-7800X 3.5GHz 6C					
	Memory	2x 8GB DDR4-2666 (non-ECC DIMM)					
	Graphics	1x NVIDIA Quadro P1000					
	Disks / Optical	1x 1TB SATA 7200 : 1x Slim DVD-ROM SATA					
	Power Supply	1000W 90% custom PSU					
	Other	N/A					

<b>Energy Consumption</b> (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	46.909		47.175		46.909	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	201.83		199.97		203.41	
	Sleep (S3)	3.041	2.971	3.165	3.041	2.971	3.165
	Off (S5)	0.978	0.898	1.159	0.978	0.898	1.159
	Zero Power Mode (ErP)	0.199		0.379		0.187	

<b>Heat Dissipation</b> (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	160.053		160.961		160.053	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	688.644		682.297		694.035	
	Sleep (S3)	10.376	10.137	10.799	10.376	10.137	10.799
	Off (S5)	3.337	3.064	3.954	3.337	3.064	3.954
	Zero Power Mode (ErP)	0.678		1.293		0.638	

<b>Example Z4 G4 Workstation Configuration #6</b>	Processor	1x Intel Core i7-7920X 2.9GHz 12C					
	Memory	4x 16GB DDR4-2666 (non-ECC DIMM)					
	Graphics	1x NVIDIA Quadro P4000					
	Disks / Optical	2x 2TB SATA 7200 : 1x Slim DVD-ROM SATA					
	Power Supply	1000W 90% custom PSU					

### System Technical Specifications

	Other	N/A					
<b>Energy Consumption</b> (Watts)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	53.392		51.332		53.367	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	318.58		307.82		319.71	
	Sleep (S3)	3.558	3.486	3.694	3.558	3.486	3.694
	Off (S5)	0.972	0.895	1.160	0.972	0.895	1.160
	Zero Power Mode (ErP)	0.201		0.391		0.186	
<b>Heat Dissipation</b> (Btu/hr)		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled
	Windows Idle (S0)	182.174		175.144		182.088	
	Windows Busy Typ(S0)	TBD		TBD		TBD	
	Windows Busy Max (S0)	1086.994		1050.281		1090.851	
	Sleep (S3)	12.139	11.894	12.604	12.139	11.894	12.604
	Off (S5)	3.316	3.054	3.957	3.316	3.054	3.957
	Zero Power Mode (ErP)	0.685		1.334		0.634	

**NOTE:** Power consumption measurements do not take advantage of the Intel Turbo Boost Technology. As a result, power consumption measurements may be higher.

### DECLARED NOISE EMISSIONS

Declared Noise Emissions (Entry-level and High-end configurations)		
<b>System Configuration</b> (Entry level)	<b>Processor Info</b>	Intel® Xeon® W-2125 4.0 2666 4C CPU
	<b>Memory Info</b>	32GB (4x8GB) DDR4-2666 ECC Reg RAM
	<b>Graphics Info</b>	1-NVIDIA® Quadro® P400 2GB
	<b>Disks/Optical</b>	1-500GB SATA 7200RPM 3.5" HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer
	<b>Power Supply</b>	465 W

<b>Declared Noise Emissions</b> (in accordance with ISO 7779 and ISO 9296)		<b>Sound Power</b> (LWAd, bels)	<b>Deskside Sound Pressure</b> (LpAm, decibels)
	<b>Idle</b>	3.2	13
	<b>Hard drive Operating</b> (random reads)	3.4	15

<b>System Configuration</b> (High end)	<b>Processor Info</b>	Intel® Xeon® W-2155 3.3 2666 10C
	<b>Memory Info</b>	128GB (8x16GB) DDR4-2666 ECC Reg RAM
	<b>Graphics Info</b>	1-NVIDIA® Quadro® P6000 24GB
	<b>Disks/Optical</b>	2-4TB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer
	<b>Power Supply</b>	750 W

### System Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.5	22
	Hard drive Operating (random reads)	3.7	23

System Configuration (Entry Level 2)	Processor Info	Intel® Core i9-7900X 3.3 2666 10C
	Memory Info	32GB (4x8GB) DDR4-2666 nECC RAM
	Graphics Info	1-NVIDIA® Quadro® P400 2GB
	Disks/Optical	1-500GB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer
	Power Supply	1000 W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.4	16
	Hard drive Operating (random reads)	3.5	17

System Configuration (High end 2)	Processor Info	Intel®Core i9-7980XE 2.6 2666 18C
	Memory Info	128GB (8x16GB) DDR4-2666 nECC RAM
	Graphics Info	1-NVIDIA® Quadro® P6000 24GB
	Disks/Optical	2-4TB SATA 7200RPM Ent 3.5" / 1-HP 9.5mm Slim Blu Ray Disc Writer
	Power Supply	1000 W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.5	20
	Hard drive Operating (random reads)	3.7	21

**NOTE:** Higher noise levels may be experienced with non-HP approved graphic card(s). Some consumer graphics cards have side blowing fans that may heat up thermal sensor(s) on the mother board causing fans to ramp.

### ENVIRONMENTAL DATA

Environmental Requirements	Temperature	Non-operating: -40° to 60° C (-40° to 140° F) Operating: 5° to 35° C (40° to 95° F) Above 1524 m (5,000 feet) altitude, the maximum operating temperature is reduced by 1° C (1.8° F) for every 305 m (1,000 feet) increase in elevation Maximum rate of change: 10 °C/hr No direct sustained sunlight
	Humidity	Operating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb

### System Technical Specifications

	Non-operating: 10% to 90% RH, non-condensing, 35° C maximum wet bulb
<b>Maximum Altitude</b>	Operating (with Rotational Hard Drives): 3,048 m (10,000 feet) Operating (with only Solid-State Drives): 5,000 m (16,404 feet) Non-operating: 12,192 m (40,000 feet) Maximum operating temperature is reduced as altitude increases. See Temperature for details.
<b>Shock (non-repetitive)</b>	Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g) Non-operating square: 422 cm/s, 20g
<b>Vibration</b>	Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g <sup>2</sup> /Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g <sup>2</sup> /Hz

### Physical Security and Serviceability

<b>Access Panel</b>	Tool-less Includes system board and memory information.
<b>Hard Drives</b>	Tool-less
<b>Expansion Cards</b>	Tool-less
<b>Processor Socket</b>	Tool-less
<b>Blue User Touch Points</b>	Yes, on primary serviceable components.
<b>Color-coordinated Cables and Connectors</b>	Yes
<b>Memory</b>	Tool-less
<b>System Board</b>	Screw-In
<b>Dual Color Power/Failure LED</b>	Yes
<b>HDD Activity LED</b>	Yes <a href="#">Note: HDD Activity LED is not dual-color</a>
<b>Configuration Record SW</b>	Yes
<b>Over-Temp Warning on Screen</b>	Yes, at POST screen on reboot
<b>Restore CD/DVD Set</b>	Restores the computer to its original factory shipping image; can be obtained via HP Support.
<b>Dual Function Front Power Switch</b>	Yes, causes a fail-safe power off when held for 4 seconds
<b>Padlock Support</b>	Yes (optional): Locks side cover and secures chassis from theft 7.0 mm (0.2756 in) diameter padlock loop at rear of system
<b>Cable Lock Support</b>	Yes, Kensington Cable Lock (optional): Locks side cover and secures chassis from theft 3 mm x 7 mm slot at rear of system
<b>Universal Chassis Clamp Lock Support</b>	Yes (optional): Locks side cover and locks cables to chassis. Secures chassis from theft and allows multiple units to be chained together when used with optional cable Threaded feature at rear of system
<b>Solenoid Lock and Hood Sensor</b>	Yes (optional) The Solenoid Hood Lock eliminates the need for a physical key by making the chassis lockable through software and a password. You can also lock and unlock the chassis remotely over the network. The Sensor Kit detects when the access panel has been removed



### System Technical Specifications

<b>Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control</b>	Yes, enables or disables serial, USB, audio, and network ports	
<b>Removable Media Write/Boot Control</b>	Yes, prevents ability to boot from removable media on supported devices (and can disable writes to media)	
<b>Power-On Password Setup Password</b>	Yes, prevents an unauthorized person from booting up the workstation	
<b>3.3V Aux Power LED on System PCA</b>	Yes, prevents an unauthorized person from changing the workstation configuration	
<b>NIC LEDs (integrated) (Green &amp; Amber)</b>	Yes	
<b>CPUs and Heatsinks</b>	A T-15 Torx or flat blade screwdriver is needed to remove the CPU heatsink before the CPU can be removed. CPU removal is tool-less	
<b>Power Supply Diagnostic LED</b>	Yes	
<b>Front Power Button</b>	Yes, ACPI multi-function	
<b>Rear Power Button</b>	Yes	
<b>Front Power LED</b>	Yes, white (normal), red (fault)	
<b>Front Hard Drive Activity LED</b>	Yes, white	
<b>Front ODD Activity LED</b>	Yes, on device	
<b>Internal Speaker</b>	Yes	
<b>System/Emergency ROM Flash Recovery</b>	Recovers corrupted system BIOS.	
<b>Cooling Solutions</b>	Air cooled forced convection heatsinks	
<b>Power Supply Fans</b>	80 mm x 80 mm x 25 mm (non-serviceable)	
<b>CPU Heatsink Fan</b>	<b>Intel® Xeon® W Processor Family</b> 92 mm x 92 mm x 25 mm, 5-wire, PWM	<b>Intel® Core™ X-series Processors</b> Core i7-X configs: 92 mm x 92 mm x 25 mm, 5-wire, PWM Core i9-X 165W CPU configs: 92 mm x 92 mm x 25 mm, 6-wire, PWM (includes 6-to-5pin cable adapter) <b>NOTE:</b> Core i9X 140W use the same Heatsink as Core i7X and Xeon
<b>Chassis Fan</b>	Front: (Optional) 92 mm x 92mm x 25 mm, 4-wire, PWM  Rear: 120 mm x 120mm x 25 mm, 4-wire, PWM	
<b>Memory Heatsink Fan</b>	Dual 60 mm x 60 mm x 25 mm, 6-wire, PWM, Blindmate (optional based on configuration)	
<b>HP PC Hardware Diagnostics UEFI</b>	HP PC Hardware Diagnostics (UEFI) enables hardware level testing outside the operating system on many components. The diagnostics can be invoked by pressing ESC then F2 upon the PC reboot, and is available as a download from HP Support.	
<b>Access Panel Key Lock</b>	Yes, side panel barrel keylock (optional from the factory only)	
<b>ACPI-Ready Hardware</b>	Advanced Configuration and Power Management Interface (ACPI).	
	<ul style="list-style-type: none"> <li>Allows the system to wake from a low-power mode.</li> </ul>	

### System Technical Specifications

- Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system

<b>Trusted Platform Module Chip</b>	Infineon TPM 2.0 Certified
<b>Integrated Chassis Handles</b>	Yes, Front handle and dedicated rear recess
<b>Power Supply</b>	Requires T15 Torx or flat blade screwdriver
<b>PCIe Card Retention</b>	Yes, rear (all), middle (all), front (full-length cards with extender, using HP Z4 G4 Fan and Front Card Guide Kit)
<b>Flash ROM</b>	Yes
<b>Diagnostic Power Switch LED on board</b>	Yes
<b>Clear Password Jumper</b>	Yes
<b>Clear CMOS Button</b>	Yes
<b>CMOS Battery Holder</b>	Yes
<b>DIMM Connectors</b>	Yes

### BIOS

<b>BIOS 32-bit Services</b>	Standard BIOS 32-bit Service Directory Proposal v0.4
<b>PCI 3.0 Support</b>	Full BIOS support for PCI Express through industry standard interfaces.
<b>ATAPI</b>	ATAPI Removable Media Device BIOS Specification Version 1.0.
<b>BBS</b>	BIOS Boot Specification v1.01.
<b>WMI Support</b>	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications.
<b>BIOS Boot Spec 1.01+</b>	Provides more control over how and from what devices the workstation will boot.
<b>BIOS Power On</b>	Users can define a specific date and time for the system to power on.
<b>ROM Based Computer Setup Utility (F10)</b>	Review and customize system configuration settings controlled by the BIOS.
<b>System/Emergency ROM Flash Recovery with Video</b>	Recovers system BIOS in corrupted Flash ROM.
<b>Replicated Setup</b>	Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
<b>SMBIOS</b>	System Management BIOS 2.8, for system management information.
<b>Boot Control</b>	Disables the ability to boot from removable media on supported devices.
<b>Memory Change Alert</b>	Alerts management console if memory is removed or changed.
<b>Thermal Alert</b>	Monitors the temperature state within the chassis. Three modes: <ul style="list-style-type: none"> <li>NORMAL - normal temperature ranges.</li> <li>ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown.</li> <li>SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.</li> </ul>
<b>Remote ROM Flash</b>	Provides secure, fail-safe ROM image management from a central network console.
<b>ACPI (Advanced Configuration and Power Management Interface)</b>	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.



### System Technical Specifications

<b>Ownership Tag</b>	Supports ACPI 5.0 for full compatibility with 64-bit operating systems.
<b>Remote Wakeup/Remote Shutdown</b>	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen. System administrators can power on, restart, and power off a client computer from a remote location with Intel Xeon W Processors. For systems with Intel Core X-Series Processors, Wake on LAN is supported, however to remotely restart or shutdown a system, a remote desktop application must be used to manually Restart or Shutdown.
<b>Instantly Available PC (Suspend to RAM - ACPI sleep state S3)</b>	Allows for very low power consumption with quick resume time.
<b>Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)</b>	Allows a new or existing system to boot over the network and download software, including the operating system.
<b>ROM revision levels</b>	Reports the system BIOS revision level in Computer Configuration Utility (F10 Setup). Version is available through an industry standard interface (SMBIOS and WMI) so that management SW applications can use and report this information.
<b>System board revision level</b>	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
<b>Start-up Diagnostics (Power-on Self-Test)</b>	Assesses system health at boot time with selectable levels of testing.
<b>Auto Setup when new hardware installed</b>	System automatically detects addition of new hardware.
<b>Keyboard-less Operation</b>	The system can be booted without a keyboard.
<b>Localized ROM Setup</b>	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 14 languages with local keyboard mappings.
<b>Asset Tag</b>	The user or MIS to set a unique tag string in non-volatile memory.
<b>Per-slot Control</b>	Allows I/O slot parameters (option ROM enable/disable, bus latency) to be configured individually.
<b>Adaptive Cooling</b>	Control parameters are set according to detected hardware configuration for optimal acoustics.
<b>Pre-boot Diagnostics</b>	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
<b>Industry Standard Specification Support</b>	
<b>Industry Standard UEFI Specification Revision</b>	Revision Supported by the BIOS 2.5
<b>ACPI</b>	Advanced Configuration and Power Management Interface, Version 5.0
<b>ATA (IDE)</b>	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
<b>CD Boot</b>	"El Torito" Bootable CD-ROM Format Specification Version 1.0
<b>EDD</b>	- Enhanced Disk Drive Specification Version 1.1 - BIOS Enhanced Disk Drive Specification Version 3.0
<b>EHCI</b>	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
<b>PCI</b>	PCI Local Bus Specification, Revision 2.3 PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0, Draft .7
<b>PCI Express</b>	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0
<b>PMM</b>	POST Memory Manager Specification, Version 1.01
<b>SATA</b>	Serial ATA Specification, Revision 1.0a Serial ATA 3 Gb/s: Serial ATA Specification, Revision 2.5 Serial ATA 6 Gb/s: Serial ATA Specification, Revision 3.0
<b>SPD</b>	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
<b>TPM</b>	Trusted Platform Module (TPM) 2.0 (Infineon SLB 9670)

### System Technical Specifications

<b>UHCI</b>	Common Criteria EAL4+ Certified
	FIPS 140-2 Certified
<b>USB</b>	TCG TPM Certified products list: <a href="http://www.trustedcomputinggroup.org/certification/tpm-certified-products/">http://www.trustedcomputinggroup.org/certification/tpm-certified-products/</a>
	Universal Host Controller Interface Design Guide, Revision 1.1
<b>SMBIOS</b>	Universal Serial Bus Revision 1.1 Specification
	Universal Serial Bus Revision 2.0 Specification
<b>SMBIOS</b>	Universal Serial Bus Revision 3.1 G1 Specification
	Universal Serial Bus Revision 3.1 G2 Specification
<b>SMBIOS</b>	System Management BIOS Reference Specification, Version 2.8
	External BIOS simulator found at: <a href="http://h20464.www2.hp.com/index.html">http://h20464.www2.hp.com/index.html</a>

### Social and Environmental Responsibility

**Eco-Label Certifications & Declarations** This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- ENERGY STAR® (energy-saving features available on selected configurations-Windows only)
- US Federal Energy Management Program (FEMP)
- China Energy Conservation Program
- The ECO declaration (TED)

The Z4 G4 is registered EPEAT® Gold in the US and Canada. EPEAT® registration varies by country. See <http://www.epeat.net> for registration status by country. Search keyword generator on HP's 3<sup>rd</sup> party option store for solar generator accessories at <http://www.hp.com/go/options>

**Batteries** The battery in this product complies with EU Directive 2006/66/EC  
Battery mass: 3g  
Battery type: Lithium Metal

The battery in this product does not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 40ppm by weight

**Restricted Material Usage** This product meets the material restrictions specified in HP's General Specification for the Environment.

HP Inc. is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis

**Low Halogen Statement** This product is low-halogen except for power cords, external cables and peripherals. Service parts obtained after purchase may not be low-halogen.

**End-of-Life Management and Recycling** HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. This product is greater than 90% recyclable by weight when properly disposed of at end of life.

### System Technical Specifications

#### HP Inc. Corporate Environmental Information

#### Additional Information

For more information about HP's commitment to the environment:

[Sustainability Report](#)

[Eco-label certifications ISO 14001 certificates](#)

- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC. [Product Disassembly Instructions](#)
- Plastic parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

#### Packaging

HP Workstation product packaging meets the [HP's General Specification for the Environment](#)

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment
- Does not contain ozone-depleting substances (ODS)
- Does not contain heavy metals (lead, mercury, cadmium or hexavalent chromium) in excess of 100 ppm sum total for all heavy metals listed
- Maximizes the use of post-consumer recycled content materials in packaging materials
- All packaging material is recyclable
- All packaging material is designed for ease of disassembly
- Reduced size and weight of packages to improve transportation fuel efficiency
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards formatting
- A multi-unit eco packaging option is available to institutional customers that uses less packaging material or has a lower volume footprint than conventional single-unit packaging. Please contact your sales representative for additional details.

#### Packaging Materials

#### Internal

Cushions and plastic bags made of low density polyethylene (LDPE).

#### External

Outer carton, accessories carton, and insert made of corrugated paper board.

### Manageability

#### Industry Standard Specifications

#### Intel® Xeon® W Processor Family

This product meets the following industry standard specifications for manageability functionality:

- DASH 1.1 (via Intel® LAN on motherboard)

#### Intel Active Management Technology (AMT)

Intel® Active Management Technology (AMT) 11.1x

An advanced set of remote management features and functionality providing IT administrators the latest and most effective tools to remotely discover, heal, and protect networked client systems regardless of the system's health or power state. AMT 11.1x includes the following advanced management functions:

- Power Management (on, off, reset, graceful shutdown, sleep and hibernate)
  - Support in Max Power Savings (Shutdown and Hibernate Modes)
- Hardware Inventory (includes BIOS and firmware revisions)
- Hardware Alerting
- Agent Presence
- System Defense Filters

#### Intel® Core™ X-series Processors

None apply

### System Technical Specifications

- Serial Over LAN (SOL)
- USB Redirect (Media Redirection)
- ME Wake-on-LAN (WOL), even with Maximum Power Savings Enabled
- DASH 1.1 compliance
- IPv6 Support
- Fast Call for Help - a client inside or outside the firewall may initiate a call for help via BIOS screen, periodic connections, or alert triggered connection
- Remote Scheduled Maintenance - pre-schedule when the system connects to the IT or service provider console for maintenance.
- Remote Alerts - automatically alert IT or service provider if issues arise
- Access Monitor - Provides oversight into Intel® AMT actions to support security requirements
- PC Alarm Clock
- Microsoft NAP Support
- Host Base set-up and configuration
- Management Engine (ME) firmware roll back
- Local Time Sync to UTC
- Remote Memory Dump Command – Creates memory dump for debug

**Intel® vPro™ Technology** The HP Z4 G4 Workstation supports Intel® vPro™ technology when configured as outlined below:

Not supported

- Intel® Xeon® processor W-2100 product family featuring Intel® vPro™ Technology
- Intel® C422 chipset
- Intel® I219LM GbE LAN

### Remote Manageability Software Solutions

The HP Z4 G4 Workstation is supported on the following optional remote manageability software consoles:

- Microsoft System Center Configuration Manager

- LANDesk Management Suite (HP recommended solution)
- Microsoft System Center Configuration Manager

For questions or support for manageability needs, please visit <http://www.hp.com/go/easydeploy>

### System Software Manager

For easydeploy questions or support for SSM, please visit: <http://www.hp.com/go/ssm>

### System Technical Specifications

#### Service, Support, and Warranty

On-site Warranty and Service (**Note 1**): Three-years, limited warranty and service offering delivers on-site, next business-day (**Note 2**) service for parts and labor and includes free telephone support (**Note 3**) 8am - 5pm. Global coverage (**Note 2**) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering. 24/7 operation will not void the HP warranty.

**NOTE 1:** Terms and conditions may vary by country. Certain restrictions and exclusions apply.

**NOTE 2:** On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

**NOTE 3:** Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24x7 support service may not be available in some countries.

HP Care Pack Services extend service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: <http://www.hp.com/go/lookuptool>. Service levels and response times for HP Care Packs may vary depending on your geographic location.

#### Product Change Notification

- Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile.
- PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition.
- Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.



### Stable & Consistent Offerings

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware designed and tested to work with all HP Z Workstation platforms through their end of life. These components and their corresponding HP Workstation platform compatibility are outlined in this section.

HP Stable & Consistent Offerings are available worldwide to all HP Workstation customers-no special programs, no additional cost-no kidding. Simply select your hardware components when you customize your HP Workstation and be assured that you'll be able to buy that same configuration throughout the lifecycle of the product.

Processors	Product #	Offering
	TBD	Intel® Xeon® W-2125 4.0 2666 4C CPU
	TBD	Intel® Xeon® W-2123 3.6 2666 4C CPU
	TBD	Intel® Xeon® W-2102 2.9 2400 4C CPU
Hard Drives	Product #	Offering
	LQ037AA	1TB SATA 7200 RPM
Graphics	Product #	Offering
	2TF08AA	AMD Radeon™ Pro WX 3100 4GB Graphics
Memory	Product #	Offering
	TBD	TBD
	TBD	TBD
	TBD	TBD
	TBD	TBD
	TBD	TBD
	TBD	TBD
	TBD	TBD
Optical and Removable Storage	Product #	Offering
	TBD	TBD
	TBD	TBD

## Technical Specifications - Processors

### **Intel® Xeon® W-2100 Series CPU**

Intel® Xeon® W-2195 2.3 2666 18C CPU

Intel® Xeon® W-2175 2.5 2666 14C CPU

Intel® Xeon® W-2155 3.3 2666 10C CPU

Intel® Xeon® W-2145 3.7 2666 8C CPU

Intel® Xeon® W-2135 3.7 2666 6C CPU

Intel® Xeon® W-2133 3.6 2666 6C CPU

Intel® Xeon® W-2125 4.0 2666 4C CPU

Intel® Xeon® W-2123 3.6 2666 4C CPU

Intel® Xeon® W-2104 3.2 2400 4C CPU

Intel® Xeon® W-2102 2.9 2400 4C CPU

### **Intel® Core™ X-Series CPU**

Intel® Core™ i9-9980XE 3.0 2666 18C CPU

Intel® Core™ i9-9920X 3.5 2666 12C CPU

Intel® Core™ i9-9820X 3.3 2666 10C CPU

Intel® Core™ i7-9800X 3.8 2666 8C CPU

Intel® Core™ i9-7980XE 2.6 2666 18C CPU

Intel® Core™ i9-7960X 2.8 2666 16C CPU

Intel® Core™ i9-7940X 3.1 2666 14C CPU

Intel® Core™ i9-7920X 2.9 2666 12C CPU

Intel® Core™ i9-7900X 3.3 2666 10C CPU

Intel® Core™ i7-7820X 3.6 2666 8C CPU

Intel® Core™ i7-7800X 3.5 2400 6C CPU

Technical Specifications - Hard Drives

STORAGE/HARD DRIVES

HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations	HP 300GB SAS 15K SFF HDD	Capacity	300GB	
		Height	5.9 in; 15 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
		Interface	12Gb/s SAS	
		Synchronous Transfer Rate (Maximum)	Up to 1200 MB/s (SAS single port)	
		Buffer	128MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Average	2.0ms
		Rotational Speed	15K rpm	
		Operating Temperature	41° to 131° F (5° to 55° C)	

### Technical Specifications - Hard Drives

<b>SATA (Serial ATA) Hard Drives for HP Workstations</b>	<b>500GB SATA 7200 rpm 6Gb/s 3.5" HDD</b>	<b>Capacity</b>	500GB	
		<b>Height</b>	1 in; 2.54 cm	
		<b>Width</b>		<b>Media Diameter</b> 3.5 in; 8.9 cm
				<b>Physical Size</b> 4 in; 10.17 cm
		<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s	
		<b>Buffer</b>	16MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2 ms
			<b>Average</b>	11 ms
			<b>Full Stroke</b>	21 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Logical Blocks</b>	976,773,168	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
	<b>1TB SATA 7200 rpm 6Gb/s 3.5" HDD</b>	<b>Capacity</b>	1TB	
		<b>Height</b>	1 in; 2.54 cm	
		<b>Width</b>		<b>Media Diameter</b> 3.5 in; 8.9 cm
				<b>Physical Size</b> 4 in; 10.17 cm
		<b>Interface</b>	Serial ATA (6.0Gb/s), NCQ enabled	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600 MB/s	
		<b>Buffer</b>	64MB	
		<b>Cache</b>	Adaptive	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	2 ms
			<b>Average</b>	11 ms
			<b>Full Stroke</b>	21 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Operating Temperature</b>	41° to 131° F (5° to 55° C)	
	<b>2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD</b>	<b>Capacity</b>	2.0TB	
		<b>Height</b>	1 in; 2.54 cm	
		<b>Width</b>		<b>Media Diameter</b> 3.5 in; 8.9 cm
				<b>Physical Size</b> 4 in; 10.17 cm
		<b>Interface</b>	Serial ATA (6.0 Gb/s), NCQ Enabled	
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600 MB/s	
		<b>Buffer</b>	64MB	
		<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	1.0 ms
			<b>Average</b>	11 ms
			<b>Full Stroke</b>	18 ms
		<b>Rotational Speed</b>	7,200 rpm	
		<b>Logical Blocks</b>	3,907,029,168	

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Hard Drives

		<b>Operating Temperature</b> 41° to 131° F (5° to 55° C)	
<b>1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	SATA	
	<b>Form Factor</b>	3.5"	
	<b>Controller</b>	AHCI	
	<b>Reliability (MTBF)</b>	2.0M hours	
	<b>Rated Power On Hours</b>	8760/yr	
	<b>Annualized Failure Rate</b> (based on Rated POH)	<0.62%	
	<b>Rated for 24/7/365 operation</b>	YES	
	<b>Physical Size (Height)</b>	1 in; 2.54 cm	
	<b>Physical Size (Width)</b>	4 in; 10.17 cm	
	<b>Media Diameter</b>	3.5 in; 8.9 cm	
	<b>Interface</b>	Serial ATA (6Gb/s), NCQ enabled	
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s	
	<b>Buffer</b>	128MB	
	<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b>	0.32ms
		<b>Average</b>	7.45ms
		<b>Full Stroke</b>	14.2ms
	<b>Operating Temperature</b>	41° to 140° F (5° to 60° C)	
	<b>Performance</b>	<b>Sequential Read</b>	up to 226MB/s
		<b>Sequential Write</b>	up to 226MB/s
	<b>Enterprise Class Features</b>	High Reliability	

### Technical Specifications - Hard Drives

#### 4TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)

<b>Capacity</b>	4TB
<b>Height</b>	0.275 in; 0.7 cm
<b>Width</b>	<b>Media Diameter</b> 2.5 in; 6.36 cm
	<b>Physical Size</b> 2.75 in; 6.99 cm
<b>Interface</b>	Serial ATA (6Gb/s), NCQ enabled
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
<b>Buffer</b>	128MB
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 0.7ms
	<b>Average</b> 8.5ms
	<b>Full Stroke</b> 15.7ms
<b>Rotational Speed</b>	7,200 rpm
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

#### 500GB SATA 7.2K SED SFF HDD

<b>Capacity</b>	500GB
<b>Height</b>	0.275 in; 0.7 cm
<b>Width</b>	<b>Media Diameter</b> 2.5 in; 6.36 cm
	<b>Physical Size</b> 2.75 in; 6.99 cm
<b>Interface</b>	Serial ATA (6Gb/s)
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
<b>Buffer</b>	32MB
<b>Seek Time</b> (typical reads, includes controller overhead, including settling)	<b>Single Track</b> 1ms
	<b>Average</b> 4.2ms
	<b>Full Stroke</b> 25ms (typical)
<b>Rotational Speed</b>	7,200 rpm
<b>Operating Temperature</b>	32° to 140° F (0° to 60° C)

### Technical Specifications - Hard Drives

#### SATA SSDs for HP Workstations

#### HP 256GB SATA 6Gb/s SSD

<b>Capacity</b>	256GB
<b>Protocol</b>	SATA
<b>Form Factor</b>	2.5"
<b>Controller</b>	AHCI
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	192TBW (TB Written)
<b>Reliability (MTTF)</b>	1.5M hours
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
<b>Interface</b>	SATA 6Gb/s
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Performance</b>	<b>Sequential Read</b> 530MB/s (max) <b>Sequential Write</b> 500MB/s (max) <b>Random Read</b> 55K IOPS (max) <b>Random Write</b> 83K IOPS (max)

#### HP 256GB SATA 6Gb/s SED Opal 2 SSD

<b>Capacity</b>	256GB
<b>Protocol</b>	SATA
<b>Form Factor</b>	2.5"
<b>Controller</b>	AHCI
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	192TBW (TB Written)
<b>Reliability (MTTF)</b>	1.5M hours
<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
<b>Interface</b>	6Gb/s SATA
<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)
<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
<b>Performance</b>	<b>Sequential Read</b> 530MB/s <b>Sequential Write</b> 500 MB/s <b>Random Read</b> 55K IOPS <b>Random Write</b> 83K IOPS
<b>Self-Encrypting Drive Support</b>	OPAL 2

#### HP 512GB SATA 6Gb/s SSD

<b>Capacity</b>	512GB
<b>Protocol</b>	SATA
<b>Form Factor</b>	2.5"
<b>Controller</b>	AHCI
<b>NAND Type</b>	3D TLC
<b>Endurance</b>	388TBW (TB Written)
<b>Reliability (MTTF)</b>	1.5M hours

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
	<b>Interface</b>	SATA 6Gb/s
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 530 MB/s <b>Sequential Write</b> 500 MB/s <b>Random Read</b> 95K IOPS <b>Random Write</b> 83K IOPS
<b>HP 512GB SATA SED SSD</b>	<b>Capacity</b>	512GB
	<b>Protocol</b>	SATA
	<b>Form Factor</b>	2.5"
	<b>Controller</b>	AHCI
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	388TBW (TB Written)
	<b>Reliability (MTTF)</b>	1.5M hours
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
	<b>Interface</b>	SATA 6Gb/s
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 530 MB/s <b>Sequential Write</b> 500 MB/s <b>Random Read</b> 95K IOPS <b>Random Write</b> 83K IOPS
	<b>Self-Encrypting Drive Support</b>	OPAL 1 and 2
<b>HP 1TB SATA 6Gb/s SSD</b>	<b>Capacity</b>	1TB
	<b>Protocol</b>	SATA
	<b>Form Factor</b>	2.5"
	<b>Controller</b>	AHCI
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	400TBW (TB Written)
	<b>Reliability (MTTF)</b>	1.5M hours
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
	<b>Interface</b>	SATA 6Gb/s
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 530 MB/s

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.



### Technical Specifications - Hard Drives

<b>HP 2TB SATA 6Gb/s SSD</b>	<b>Capacity</b>	2TB	<b>Sequential Write</b>	500 MB/s
	<b>Protocol</b>	SATA	<b>Random Read</b>	95K IOPS
	<b>Form Factor</b>	2.5"	<b>Random Write</b>	83K IOPS
	<b>Controller</b>	AHCI		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	400TBW (TB Written)		
	<b>Reliability (MTTF)</b>	1.5M hours		
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm		
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm		
	<b>Interface</b>	SATA 6Gb/s		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 550MB/s (Sequential Read)		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	530 MB/s	
		<b>Sequential Write</b>	500 MB/s	
		<b>Random Read</b>	95K IOPS	
		<b>Random Write</b>	83K IOPS	
<b>HP Enterprise Class 240GB SATA SSD</b>	<b>Capacity</b>	240GB		
	<b>Protocol</b>	SATA		
	<b>Form Factor</b>	2.5"		
	<b>Controller</b>	AHCI		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	2,200TBW (TB Written)		
	<b>Reliability (MTTF)</b>	2.0M hours		
	<b>Physical Size (Height)</b>	0.28 in; 0.7 cm		
	<b>Physical Size (Width)</b>	2.5 in; 6.36 cm		
	<b>Interface</b>	6Gb/s SATA		
	<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	540 MB/s	
		<b>Sequential Write</b>	310 MB/s	
		<b>Random Read</b>	93K IOPS	
		<b>Random Write</b>	48K IOPS	
<b>HP Enterprise Class 480GB SATA SSD</b>	<b>Enterprise Class Features</b>	High Endurance NAND Power Loss Protection End-to-End Data Protection		
	<b>Capacity</b>	480GB		
	<b>Protocol</b>	SATA		
	<b>Form Factor</b>	2.5"		

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

		<b>Controller</b>	AHCI
		<b>NAND Type</b>	3D TLC
		<b>Endurance</b>	4,400TBW (TB Written)
		<b>Reliability (MTTF)</b>	2.0M hours
		<b>Physical Size (Height)</b>	0.28 in; 0.7 cm
		<b>Physical Size (Width)</b>	2.5 in; 6.36 cm
		<b>Interface</b>	6Gb/s SATA
		<b>Synchronous Transfer Rate (Maximum)</b>	Up to 600MB/s
		<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
		<b>Performance</b>	<b>Sequential Read</b> 540 MB/s <b>Sequential Write</b> 460 MB/s <b>Random Read</b> 93K IOPS <b>Random Write</b> 74K IOPS
		<b>Enterprise Class Features</b>	High Endurance NAND Power Loss Protection End-to-End Data Protection
<b>PCIe SSDs for HP Workstations</b>	<b>HP Z Turbo Drive G2 256GB SSD</b>	<b>Capacity</b>	256GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	MLC
		<b>Endurance</b>	150TB
		<b>Reliability (MTBF)</b>	1.5M hours
		<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
		<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
		<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s <b>Sequential Write</b> 1100 MB/s <b>Random Read</b> 250K IOPS <b>Random Write</b> 180K IOPS
	<b>HP Z Turbo Drive G2 512GB SSD</b>	<b>Capacity</b>	512GB
		<b>Protocol</b>	PCIe
		<b>Form Factor</b>	M.2
		<b>Controller</b>	NVMe
		<b>NAND Type</b>	3D MLC
		<b>Endurance</b>	300TB
		<b>Reliability (MTBF)</b>	1.5M hours
		<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
		<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
		<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s <b>Sequential Write</b> 1600 MB/s

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

<b>HP Z Turbo Drive G2 1TB SSD</b>		<b>Random Read</b>	260K IOPS
		<b>Random Write</b>	260K IOPS
	<b>Capacity</b>	1TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D MLC	
	<b>Endurance</b>	600TB	
	<b>Reliability (MTTF)</b>	1.5M hours	
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3000 MB/s
		<b>Sequential Write</b>	1700 MB/s
		<b>Random Read</b>	360K IOPS
		<b>Random Write</b>	330K IOPS

### Technical Specifications - Hard Drives

<b>HP Z Turbo Drive Quad Pro 2x256GB PCIe SSD</b>	<b>Capacity</b>	512GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	MLC
	<b>Endurance</b>	150TB
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCIe Gen3 x4 architecture
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 1100 MB/s
		<b>Random Read</b> 250K IOPS
		<b>Random Write</b> 180K IOPS
<b>HP Z Turbo Drive Quad Pro 2x512GB PCIe SSD</b>	<b>Capacity</b>	1TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	MLC
	<b>Endurance</b>	292TB
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCIe Gen3 x4 architecture
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 1600 MB/s
		<b>Random Read</b> 250 K IOPS
		<b>Random Write</b> 180K IOPS
<b>HP Z Turbo Drive G2 256GB SED SSD</b>	<b>Capacity</b>	256GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	Half-height, half-length
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	MLC
	<b>Endurance</b>	150TBW (TB Written)
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 1100 MB/s
		<b>Random Read</b> 250K IOPS
		<b>Random Write</b> 180K IOPS

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

	<b>Self-Encrypting Drive Support</b>	OPAL 2
<b>HP Z Turbo Drive G2 512GB SED SSD</b>	<b>Capacity</b>	512GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	Half-height, half-length
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D MLC
	<b>Endurance</b>	300TBW (TB Written)
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 1600 MB/s
		<b>Random Read</b> 260K IOPS
		<b>Random Write</b> 150K IOPS
	<b>Self-Encrypting Drive Support</b>	OPAL 2
<b>HP Z Turbo Drive Quad Pro 2x1TB PCIe SSD</b>	<b>Capacity</b>	2TB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	PCIe Card, Full Height PCIe Slot
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D MLC
	<b>Endurance</b>	600TB
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 3000 MB/s
		<b>Sequential Write</b> 1700 MB/s
		<b>Random Read</b> 360K IOPS
		<b>Random Write</b> 330K IOPS
<b>HP Z Turbo Drive G2 256GB TLC SSD</b>	<b>Capacity</b>	256GB
	<b>Protocol</b>	PCIe
	<b>Form Factor</b>	M.2
	<b>Controller</b>	NVMe
	<b>NAND Type</b>	3D TLC
	<b>Endurance</b>	75TBW (TB Written)
	<b>Reliability (MTBF)</b>	1.5M hours
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)
	<b>Performance</b>	<b>Sequential Read</b> 2800 MB/s
		<b>Sequential Write</b> 320 MB/s (1100 MB/s max/Turbo)
		<b>Random Read</b> 250K IOPS

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

<b>HP Z Turbo Drive G2 512GB TLC SSD</b>	<b>Capacity</b>	512GB	<b>Random Write</b>	180K IOPS
	<b>Protocol</b>	PCIe		
	<b>Form Factor</b>	M.2		
	<b>Controller</b>	NVMe		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	150TBW (TB Written)		
	<b>Reliability (MTBF)</b>	1.5M hours		
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	2800 MB/s	
		<b>Sequential Write</b>	660 MB/s (1600 MB/s max/Turbo)	
		<b>Random Read</b>	260K IOPS	
<b>HP Z Turbo Drive G2 1TB TLC SSD</b>	<b>Capacity</b>	1TB	<b>Random Write</b>	260K IOPS
	<b>Protocol</b>	PCIe		
	<b>Form Factor</b>	M.2		
	<b>Controller</b>	NVMe		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	300TBW (TB Written)		
	<b>Reliability (MTBF)</b>	1.5M hours		
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	3000 MB/s	
		<b>Sequential Write</b>	1150 MB/s (1700 MB/s max/Turbo)	
		<b>Random Read</b>	360K IOPS	
<b>HP Z Turbo Drive Dual Pro 256GB SSD</b>	<b>Capacity</b>	256GB	<b>Random Write</b>	330K IOPS
	<b>Protocol</b>	PCIe		
	<b>Form Factor</b>	M.2 in Half-height, half-length card		
	<b>Controller</b>	NVMe		
	<b>NAND Type</b>	3D TLC		
	<b>Endurance</b>	75TBW (TB Written)		
	<b>Reliability (MTBF)</b>	1.5M hours		
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical		
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)		
	<b>Performance</b>	<b>Sequential Read</b>	2800 MB/s	
		<b>Sequential Write</b>	320 MB/s (1100 MB/s max/Turbo)	
		<b>Random Read</b>	250K IOPS	

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Hard Drives

		<b>Random Write</b>	180K IOPS
<b>HP Z Turbo Drive Dual Pro 512GB SSD</b>	<b>Capacity</b>	512GB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2 in Half-height, half-length card	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	150TBW (TB Written)	
	<b>Reliability (MTBF)</b>	1.5M hours	
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	2800 MB/s
		<b>Sequential Write</b>	660 MB/s (1600 MB/s max/Turbo)
		<b>Random Read</b>	260K IOPS
		<b>Random Write</b>	260K IOPS
<b>HP Z Turbo Drive Dual Pro 1TB SSD</b>	<b>Capacity</b>	1TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2 in Half-height, half-length card	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	300TBW (TB Written)	
	<b>Reliability (MTBF)</b>	1.5M hours	
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3000 MB/s
		<b>Sequential Write</b>	1150 MB/s (1700 MB/s max/Turbo)
		<b>Random Read</b>	360K IOPS
		<b>Random Write</b>	330K IOPS
<b>HP Z Turbo Drive Dual Pro 2TB SSD</b>	<b>Capacity</b>	2TB	
	<b>Protocol</b>	PCIe	
	<b>Form Factor</b>	M.2 in Half-height, half-length card	
	<b>Controller</b>	NVMe	
	<b>NAND Type</b>	3D TLC	
	<b>Endurance</b>	300TBW (TB Written)	
	<b>Reliability (MTBF)</b>	1.5M hours	
	<b>Interface</b>	PCI Express 3.0 x4 electrical x4 physical	
	<b>Operating Temperature</b>	32° to 158° F (0° to 70° C)	
	<b>Performance</b>	<b>Sequential Read</b>	3000 MB/s
		<b>Sequential Write</b>	1150 MB/s (1700 MB/s max/Turbo)
		<b>Random Read</b>	360K IOPS
		<b>Random Write</b>	330K IOPS

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

			<b>Sequential Write</b>	1150 MB/s (1700 MB/s max/Turbo)
			<b>Random Read</b>	360K IOPS
			<b>Random Write</b>	330K IOPS
<b>Intel® 905p Series AIC PCIe SSD</b>	<b>Intel® 905p Series AIC 280GB PCIe SSD</b>	<b>Capacity</b>	280GB	
		<b>Protocol</b>	PCIe	
		<b>Form Factor</b>	PCIe Card, Half Height	
		<b>Controller</b>	NVMe	
		<b>NVM Type</b>	3DXPoint	
		<b>Endurance</b>	5.11 PBW (PB Written)	
		<b>Reliability (MTBF)</b>	1.6M hours	
		<b>Operating Temperature</b>	32° to 185° F (0° to 85° C)	
		<b>Performance</b>	<b>Sequential Read</b>	2730 MB/s
			<b>Sequential Write</b>	2280 MB/s
			<b>Random Read</b>	587K IOPS
			<b>Random Write</b>	559K IOPS
	<b>Intel® 905p Series AIC 480GB PCIe SSD</b>	<b>Capacity</b>	480TB	
		<b>Protocol</b>	PCIe	
		<b>Form Factor</b>	PCIe Card, Half Height	
		<b>Controller</b>	NVMe	
		<b>NVM Type</b>	3DXPoint	
		<b>Endurance</b>	8.76 PBW (PB Written)	
		<b>Reliability (MTBF)</b>	1.6M hours	
		<b>Operating Temperature</b>	32° to 185° F (0° to 85° C)	
		<b>Performance</b>	<b>Sequential Read</b>	27100 MB/s
			<b>Sequential Write</b>	2280 MB/s
			<b>Random Read</b>	582K IOPS
			<b>Random Write</b>	561K IOPS



### Technical Specifications - Hard Drive Controllers

#### HARD DRIVE CONTROLLERS

<b>MicroSemi 2100-4i4e 8-port SAS 12Gb/s RAID Card</b>	<b>PCI Bus</b>	8 lanes, PCI Express 3.0	
	<b>RAID Levels</b>	Offers Integrated RAID (0, 1, and 10)	
	<b>PCI Data Burst Transfer Rate</b>	Half Duplex x8, PCIe, 8000 MB/s	
	<b>SAS Bandwidth</b>	<b>Half Duplex</b>	1200 MB/s per lane
	<b>PCI Card Type</b>	3.3V Add-in Card	
	<b>PCI Voltage</b>	12 V ± 10%	
	<b>PCI Power</b>	9.8W typical, Airflow min 200 LFM	
	<b>Bracket</b>	Full height and low profile	
	<b>Certification Level</b>	PCI Express 3.0 compliant	
	<b>SAS Processor</b>	MicroSemi Series 8 SAS Controller	
	<b>Internal Connectors</b>	One x4 internal mini-SASHD (SFF-8643)	
	<b>External Connectors</b>	One x4 external mini-SASHD (SFF-8644)	
	<b>Maximum Number of SCSI Devices</b>	256 Non-RAID SAS/SATA devices	
	<b>LED Indicators</b>	Connector for Drive Activity Light	

### Technical Specifications - Graphics

#### GRAPHICS

<b>NVIDIA® Quadro® P400 2GB Graphics</b>	<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P400 Graphics Card GP107 GPU 256 CUDA cores Max Power: 30 Watts
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 64-bit Memory Bandwidth: 32 GB/s
	<b>Connectors</b>	3mDP Outputs*
	<b>Maximum Resolution</b>	DisplayPort™ 1.4: - up to 3x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
	<b>Display Output</b>	3 mDP Connectors
	<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
	<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
	<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux
		HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
	<b>Notes</b>	*P400, P600 and P1000 only have mini-DisplayPort™ (mDP) video ports.  Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included After market option kit:Two mDP-to-DP Adapters included  Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories: - 2MY05AA - HP miniDP-to-DP Adapter Cables - 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L
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**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

#### NVIDIA® Quadro® P600 1<sup>st</sup> GFX 2GB Graphics

Single Slot, Low Profile  
Cooling: Active  
Weight: 129 grams

<b>Graphics Controller</b>	NVIDIA® Quadro® P600 Graphics Card GP107 GPU 384 CUDA cores Max Power: 40 Watts
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 128-bit Memory Bandwidth: 64 GB/s
<b>Connectors</b>	4mDP Outputs *
<b>Maximum Resolution</b>	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
<b>Display Output</b>	4 mDP Connectors
<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Notes** \*P400, P600 and P1000 only have mini-DisplayPort™ (mDP) video ports.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

#### NVIDIA® Quadro® P620 2GB Graphics

#### Form Factor

Dimensions: 2.713" H x 5.7" L  
Single Slot, Low Profile  
Cooling: Active  
Weight: 129 grams

### Technical Specifications - Graphics

<b>Graphics Controller</b>	NVIDIA® Quadro® P620 Graphics Card GP107 GPU 512 CUDA cores Max Power: 40 Watts
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 128-bit Memory Bandwidth: 64 GB/s
<b>Connectors</b>	4mDP Outputs *
<b>Maximum Resolution</b>	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
<b>Display Output</b>	4 mDP Connectors
<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL
<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux
<b>Notes</b>	<p>HP qualified drivers may be preloaded or available from the HP support Web site:  <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p> <p>*P620 only have mini-DisplayPort™ (mDP) video ports.</p> <p>Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included            After market option kit:Two mDP-to-DP Adapters included</p> <p>Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:</p> <ul style="list-style-type: none"> <li>- 2MY05AA - HP miniDP-to-DP Adapter Cables</li> <li>- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables</li> </ul>

#### AMD FirePro™ W2100 2GB Graphics

<b>Form Factor</b>	Low Profile, half length (full-height bracket included)
<b>Graphics Controller</b>	AMD FirePro™ W2100 professional graphics based on Oland GPU. GPU: 320 Stream Processors organized into 5 Compute Units GPU Frequency: 630Mhz Power: 26W Cooling: Active
<b>Bus Type</b>	PCI Express® x8, Generation 3.0

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Graphics

<b>Memory</b>	2GB DDR3 memory Memory Bandwidth: up to 28.8 GB/s Memory Width: 128 bit
<b>Connectors</b>	2x Display Port™ 1.2 connectors  Factory Configured: No video cable adapter included After market option kit: No video cable adapter included  Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.
<b>Maximum Resolution</b>	DisplayPort™ 1.2: - up to 4096x2160 x 24 bpp @ 60Hz  Dual Link DVI(I) (requires adapter cable): - up to 2560 x 1600 x 32 bpp @ 60Hz  Single Link-DVI(I)(requires adapter cable): - up to 1920 x 1200 x 32 bpp @ 60Hz  VGA (requires adapter cable): - up to 1920 x 1200 x 32 bpp @ 60Hz
<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling.
<b>Display Output</b>	2 x DisplayPort™ 1.2a Maximum number of displays: 2
<b>Shading Architecture</b>	Shader Model 5.0
<b>Supported Graphics APIs</b>	OpenCL™ 1.2, DirectX® 11.2/12, OpenGL® 4.4  OpenGL® 4.4 support with driver release 14.301.xxx OpenCL™ 1.2 conformance expected with drive release 14.301.xxx
<b>Available Graphics Drivers</b>	Windows10 (64-bit) Windows 8.1 (64-bit) Windows 7 (64-bit) Linux®  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>	Depending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your monitor's native input to your card's DisplayPort™ or Mini-DisplayPort™ connector(s) may be required. See <a href="http://www.amd.com/FirePro">www.amd.com/FirePro</a> ™ for details.

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

<b>NVIDIA® Quadro® P1000</b> <b>1<sup>st</sup> GFX 4GB Graphics</b>	<b>Form Factor</b>	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	<b>Graphics Controller</b>	NVIDIA® Quadro® P1000 Graphics Card GP107 GPU 640 CUDA cores Max Power: 47 Watts
	<b>Bus Type</b>	PCI Express 3.0 x16
	<b>Memory</b>	Size: 4 GB GDDR5, 2500 MHz Memory Interface: 128-bit memory interface Memory Bandwidth: 80 GB/s memory bandwidth
	<b>Connectors</b>	4mDP Outputs*
	<b>Maximum Resolution</b>	DisplayPort 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	<b>Image Quality Features</b>	10-bit internal display processing pipeline 10-bit scan-out support
	<b>Display Output</b>	4 mDP Connectors
	<b>Shading Architecture</b>	Full Microsoft DirectX 12 Shader Model 5.1
	<b>Supported Graphics APIs</b>	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute, OpenCL
	<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 8.1 Microsoft Windows 7 Linux
	<b>Notes</b>	HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a> *P400, P600 and P1000 only have mini-DisplayPort™ (mDP) video ports.  Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included After market option kit: Two mDP-to-DP Adapters included  Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories: <ul style="list-style-type: none"> <li>- 2MY05AA - HP miniDP-to-DP Adapter Cables</li> <li>- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables</li> </ul>
<b>NVIDIA® Quadro® P2000</b> <b>1<sup>st</sup> GFX 5GB Graphics</b>	<b>Form Factor</b>	Dimensions: 4.4"Hx7.9"L Single Slot Cooling: Active Weight: 260 grams

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

<b>Graphics Controller</b>	NVIDIA® Quadro® P2000 Graphics Card GP106 GPU Power: 75 Watts
<b>Bus Type</b>	PCI Express 3.0 x16
<b>Memory</b>	Size: 5GB GDDR5 Memory Bandwidth: 140 GB/s Memory Width: 160-bit
<b>Connectors</b>	4x DisplayPort™ 1.4  Factory Configured Option: No adapter included with card After Market Option: No video cable adapter included
<b>Maximum Resolution</b>	Additional DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories. DisplayPort™: - up to 5120 x 2880 x 24 bpp @ 60Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) DP 1.3 & 1.4 ready.  DL-DVI(I) output: - up to 2560 x 1600 x 32 bpp @ 60 Hz  Single Link-DVI(I) output: - up to 1920 x 1200 x 32 bpp @ 60Hz
<b>Image Quality Features</b>	HDMI 2.0 (requires DP to HDMI adapter): 5120 x 2880 x 24 bpp @ 60Hz 12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)
<b>Display Output</b>	Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView. Maximum number of displays - 4 direct attached monitors  Maximum number of monitors across all available NVIDIA® Quadro® P2000 outputs is 4.
<b>Shading Architecture</b>	Shader Model 5.1
<b>Supported Graphics APIs</b>	OpenGL® 4.5 DirectX® 12  API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran software
<b>Available Graphics Drivers</b>	Microsoft Windows 10 Microsoft Windows 7 Professional 64bit Linux® - Full OpenGL® implementation, complete with NVIDIA® Quadro® and ARB extensions

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Graphics

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

1. Quadro P2000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.
2. Quadro P2000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.

<b>Radeon™ Pro WX 3100 4GB Graphics</b>	<b>Form Factor</b>	Low-Profile Single Slot (6.6" Length)
	<b>Graphics Controller</b>	Polaris12 GL GPU: 512 Stream Processors organized into 8 Compute Units Power: 50 Watts Cooling: Active
	<b>Memory</b>	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit
	<b>Connectors</b>	2x Mini DisplayPort™ 1.4 plus 1x DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: No adapters included After market option kit: One mDP-to-DP cable adapters included
	<b>Maximum Resolution</b>	Additional Mini DisplayPort™-to-DisplayPort™, DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories. 5K support @ 60Hz <ul style="list-style-type: none"> <li>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul> 3x 4K support @ 60Hz
	<b>Image Quality Features</b>	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
	<b>Display Output</b>	3 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
	<b>GPU Architecture</b>	Polaris
	<b>Supported Graphics APIs</b>	DirectX® 12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
	<b>Available Graphics Drivers</b>	Windows 10 64-bit (Windows® 7 64-bit available from AMD) Linux® 64-bit (selected Enterprise distributions)

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

#### Notes

1. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
2. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
3. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

<b>Radeon™ Pro WX 4100 4GB Graphics</b>	<b>Form Factor</b>	Low-Profile Single Slot (6.6" Length)
	<b>Graphics Controller</b>	Polaris 11 Baffin GL XT GPU: 1024 Stream Processors organized into 16 Compute Units Power: 50 Watts Cooling: Active
	<b>Memory</b>	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit
	<b>Connectors</b>	4x Mini DisplayPort™ 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: Four mDP-to-DP cable adapters included After market option kit: Four mDP-to-DP cable adapters included
	<b>Maximum Resolution</b>	Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories. 5K support @ 60Hz <ul style="list-style-type: none"> <li>• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul> 4x 4K support @ 60Hz
	<b>Image Quality Features</b>	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
	<b>Display Output</b>	4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
	<b>GPU Architecture</b>	GCN 4th Generation
	<b>Supported Graphics APIs</b>	DirectX® 12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Graphics

#### Available Graphics Drivers

Windows 10 64-bit  
Windows® 7 64-bit  
Linux® 64-bit (selected Enterprise distributions)

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

4. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
5. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
6. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windows mode content requires operating system support.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Four mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

7. 2MY05AA - HP miniDP-to-DP Adapter Cables
8. 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

#### NVIDIA® Quadro® P4000 1st GFX 8GB Graphics

#### Form Factor

Dimensions: 4.4"H x 9.5"L  
Single-slot, full-height  
Weight: 475 grams (without extender)

#### Graphics Controller

NVIDIA® Quadro® P4000 Graphics Card  
GPU: GP104 with 1792 CUDA cores  
Power: 120 Watts

#### Bus Type Memory

PCI Express 3.0 x16  
Size: 8GB GDDR5  
Memory Bandwidth: 243 GB/s  
Memory Width: 256-bit

#### Connectors

4 x DisplayPort 1.4  
3-pin mini-DIN connector via optional bracket  
1 x 6-pin auxiliary power connector  
4-pin header for stereo signal  
SYNC connector for Quadro® Sync II

### Technical Specifications - Graphics

	2 x SLI connectors
	Factory Configured Option: No video cable adapter included After Market Option: No video cable adapter included
	Additional DisplayPort-to-VGA, DisplayPort-to-HDMI, or DisplayPort-to-DVI adapters are available as accessories
<b>Maximum Resolution</b>	<p>Dual-link internal TMDS (DVI 1.0): - up to 2560 x 1600 x 32 bpp @ 60 Hz</p> <p>Single-link internal TMDS (DVI 1.0): - up to 1920 x 1200 x 32 bpp @ 60 Hz</p> <p>HDMI™ 2.0b (requires DP to HDMI adapter): - up to 5120 x 2880 x 24 bpp @ 60Hz</p> <p>DisplayPort: - up to 4096 x 2160 x 30 bpp @ 60Hz - up to 2560 x 1600 x 30 bpp @ 120 Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST)</p> <p>Using two DP outputs, the P4000 can drive one dual DP input display with 5120 x 2880 x 30 bpp @ 60Hz resolution.</p>
<b>Image Quality Features</b>	<p>Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.</p> <p>HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors</p> <p>NVIDIA 3D Vision™ and other 3D stereo technologies</p> <p>NVIDIA Mosaic and nView</p>
<b>Display Output</b>	<p>Maximum number of displays - 4 direct attached monitors</p> <p>Maximum number of monitors across all available Quadro P4000 outputs is 4.</p>
<b>Shading Architecture</b>	Shader Model 5.1
<b>Supported Graphics APIs</b>	<p>OpenGL 4.5</p> <p>DirectX 12</p> <p>Vulkan 1.0</p> <p>API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran</p>
<b>Available Graphics Drivers</b>	<p>Microsoft Windows 10</p> <p>Microsoft Windows 7</p> <p>Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions</p> <p>HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a></p>

### Technical Specifications - Graphics

#### Notes

1. Quadro P4000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately.
2. Quadro P4000 offered as an After Market Option does not include video cables. Video cable adapters must be ordered separately.

#### NVIDIA® Quadro® P5000 1<sup>st</sup> GFX 16GB Graphics

#### Form Factor

Full-Height Dual Slot (4.4" Height x 10.5" Length)  
Weight: 815 grams / 1.80 lbs

#### Graphics Controller

NVIDIA® Quadro® P5000 graphics  
GPU: 2560 NVIDIA® CUDA® Parallel Processing Cores  
Power: 180 Watts  
Cooling: Active

#### Memory

16GB GDDR5X memory  
Memory Bandwidth: Up to 288 GB/s  
Memory Width: 256 bit  
ECC Memory (disabled by default)

#### Connectors

DP (x4) with HDR support  
DL-DVI(D)  
3-pin mini-DIN connector  
SLI connector  
NVIDIA® Quadro® Sync connector (compatible with NVIDIA® Quadro® II Sync)  
One 8-pin auxiliary power connector

Factory configured option: No video cable adapter included with card.  
After market option Kit: No video cable adaptor included with card.

DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.

#### Maximum Resolution

5K support @ 60Hz  
1x single-cable 5K monitor, or 2x dual-cable 5K monitors

#### Image Quality Features

Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component.  
HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors  
NVIDIA® 3D Vision™ and other 3D stereo technologies  
NVIDIA Mosaic and nView Desktop Management

#### Display Outputs<sup>1</sup>

4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz)  
1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz)

### Technical Specifications - Graphics

<b>GPU Architecture</b>	NVIDIA Pascal™
<b>Supported Graphics APIs</b>	DirectX® 12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>	1- Supports up to a total of 4 displays

#### NVIDIA® Quadro® P6000 1<sup>st</sup> GFX 24GB Graphics

<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 967 grams / 2.14 lbs
<b>Graphics Controller</b>	NVIDIA® Quadro® P6000 graphics GPU: 3840 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
<b>Memory</b>	24GB GDDR5X memory Memory Bandwidth: Up to 432 GB/s Memory Width: 384 bit ECC Memory (disabled by default)
<b>Connectors</b>	DP (x4) with HDR support DL-DVI(D) 3-pin mini-DIN connector SLI connector Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector  Factory configured option: No video cable adapter included with card. After market option Kit: No video cable adaptor included with card.  DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.
<b>Maximum Resolution</b>	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Graphics

<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 12-bit per RGB color component. HDCP 2.2 support over DisplayPort, DVI, and HDMI connectors NVIDIA 3D Vision™ and other 3D stereo technologies NVIDIA Mosaic and nView
<b>Display Outputs<sup>1</sup></b>	4x DP1.4 HDR outputs (up to 3840x2160 UHD @ 120Hz refresh, or up to 8K at 30Hz) 1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz and 1920x1200 @ 120 Hz)
<b>GPU Architecture</b>	NVIDIA Pascal™
<b>Supported Graphics APIs</b>	DirectX® 12, OpenGL® 4.5, OpenCL™ 1.0, Vulkan™ 1.0 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>
<b>Notes</b>	1- Supports up to a total of 4 displays

#### NVIDIA® Quadro® GP100 16GB Graphics

<b>Form Factor</b>	Dual Slot (4.4" Height x 10.5" Length) Weight: 989 grams +72 grams extender
<b>Graphics Controller</b>	NVIDIA® QUADRO® GP100 GPU: 3584 NVIDIA CUDA® Parallel Processing Cores Power: 235 Watts Cooling: Active
<b>Memory</b>	16GB HBM2 Memory Bandwidth: Up to 717 GB/s Memory Width: 4096-bit ECC Memory (disabled by default)
<b>Connectors</b>	DP (x4) with HDR support DL-DVI(D) 3-pin mini-DIN connector via optional bracket 4-pin header for stereo signal Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector (2x) NVLink connectors

Factory configured option: 8-pin power adapter included with card.

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

After market option Kit: 8-pin power adapter included with card.

DVI to VGA, DisplayPort™ to VGA, DisplayPort™ to DVI, and DisplayPort™ to Dual-Link DVI adapters available as accessories.

<b>Maximum Resolution</b>	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors
<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™, DVI, and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
<b>Display Outputs</b>	4x DP1.4 MST & HDR2 outputs (up to 5120 x 2880 @ 60Hz) 1x Dual-link DVI-D output (up to 2560 x 1600 @ 60 Hz) 1x Single-link DVI-D output (up to 1920 x 1200 @ 60 Hz) HDMI™ 2.0b (up to 5120 x 2880 @ 60Hz)*  *requires DP to HDMI adapter
<b>GPU Architecture</b>	NVIDIA Pascal™
<b>Supported Graphics APIs</b>	DirectX®12 , OpenGL® 4.5, Vulkan™ 1.0 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows® 10 Windows® 7 Professional 64-bit Linux®

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

**Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included**

**After market option kit: No adapters included**

### Technical Specifications - Graphics

<b>NVIDIA® Quadro® GV100 32GB Graphics</b>	<b>Form Factor</b>	Dual Slot (4.4" Height x 10.5" Length) Weight: 980 grams + 72 grams extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® GV100 GPU: 5120 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
	<b>Memory</b>	32GB HBM2 memory Memory Bandwidth: Up to 870 GB/s Memory Width: 5120-bit ECC Memory (disabled by default)
	<b>Connectors</b>	DP (x4) with HDR support 3-pin mini-DIN connector via optional bracket 4-pin header for stereo signal Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector (2x) NVLink for GV100 connectors (via optional kit)  After market option Kit: no power adapter included with card.  DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories.
	<b>Maximum Resolution</b>	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors
	<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™ and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
	<b>Display Outputs</b>	4x DP1.4 HDR2 outputs (up to 5120 x 2880 @ 60Hz)
	<b>GPU Architecture</b>	NVIDIA® Volta™
	<b>Supported Graphics APIs</b>	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
	<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 8 & 8.1 64-bit Windows® 7 64-bit Linux® 64-bit

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.



### Technical Specifications - Graphics

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

Factory Configured (Z4/Z8 G4 Workstation): No adapters included

After market option kit: No adapters included

<b>NVIDIA® Quadro® RTX 5000 16GB Graphics</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 975 grams + 75 grams extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® RTX 5000 TU104 GPU 3072 CUDA cores Power: 265 Watts Cooling: Active
	<b>Memory</b>	16GB HBM2 memory Memory Bandwidth: Up to 448 GB/s ECC Memory (disabled by default)
	<b>Connectors</b>	DP (x4) with HDR support 3-pin mini-DIN connector via optional bracket 4-pin header for stereo signal Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector (2x) NVLink for RTX 5000 connectors (via optional kit)  After market option Kit: no power adapter included with card.
	<b>Maximum Resolution</b>	DisplayPort™ 1.4: 7680x4320 @ 60Hz
	<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™ and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
	<b>Display Outputs</b>	4x DP1.4 HDR2 outputs (up to 7680x4320 @ 60Hz)

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

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<b>GPU Architecture</b>	NVIDIA® Volta™
<b>Supported Graphics APIs</b>	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 8 & 8.1 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>  Factory Configured (Z4/Z6/Z8 G4 Workstation): No adapters included After market option kit: No adapters included

<b>NVIDIA® Quadro® RTX 6000 24GB Graphics</b>	<b>Form Factor</b>	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 995 grams + 75 grams extender
	<b>Graphics Controller</b>	NVIDIA® QUADRO® RTX 6000 TU102 GPU 4608 CUDA cores Power: 295 Watts Cooling: Active
	<b>Memory</b>	24GB HBM2 memory Memory Bandwidth: Up to 672 GB/s ECC Memory (disabled by default)
	<b>Connectors</b>	DP (x4) with HDR support 3-pin mini-DIN connector via optional bracket 4-pin header for stereo signal Quadro Sync connector (compatible with Quadro II Sync) One 8-pin auxiliary power connector (2x) NVLink for RTX 5000 connectors (via optional kit)  After market option Kit: no power adapter included with card.
		DisplayPort™ to VGA, DisplayPort™ to DVI (single-link and dual-link), and DisplayPort™ to HDMI adapters available as accessories.

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Graphics

<b>Maximum Resolution</b>	DisplayPort™ 1.4: 7680x4320 @ 60Hz
<b>Image Quality Features</b>	HDR support over DisplayPort™ 1.4 (SMPTE 2084/2086, BT. 2020) (4K @ 60 Hz 10b/12b HEVC Decode, 4K @ 60 Hz 10b HEVC Encode) HDCP 2.2 support over DisplayPort™ and HDMI connectors NVIDIA 3D Vision™ technology NVIDIA Mosaic and nView Desktop Management
<b>Display Outputs</b>	4x DP1.4 HDR2 outputs (up to 7680x4320 @ 60Hz)
<b>GPU Architecture</b>	NVIDIA® Volta™
<b>Supported Graphics APIs</b>	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
<b>Available Graphics Drivers</b>	Windows® 10 64-bit Windows® 8 & 8.1 64-bit Windows® 7 64-bit Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site: <a href="http://welcome.hp.com/country/us/en/support.html">http://welcome.hp.com/country/us/en/support.html</a>  Factory Configured (Z4/Z6/Z8 G4 Workstation): No adapters included After market option kit: No adapters included

<b>Radeon™ Pro WX 7100 1<sup>st</sup> GFX 8GB Graphics</b>	<b>Form Factor</b> <b>Graphics Controller</b>	Full-Height Single Slot (9.5" Length ) Radeon™ Pro WX 7100 graphics GPU: 2304 Stream Processors organized into 36 Compute Units Power: 130 Watts Cooling: Active
	<b>Memory</b>	8GB GDDR5 memory Memory Bandwidth: 7 Gbps / 224 GB/s Memory Width: 256 bit
	<b>Connectors</b>	4x Display Port 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: No video cable adapter included

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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After market option kit: No video cable adapter included

Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.

<b>Maximum Resolution</b>	5K support @ 60Hz <ul style="list-style-type: none"> <li>1x single-cable 5K monitor, or 2x dual-cable 5K monitors</li> </ul>
<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
<b>Display Output</b>	4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
<b>GPU Architecture</b>	GCN 4th Generation
<b>Supported Graphics APIs</b>	DirectX® 12 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows® 7 64-bit Linux® 64-bit

HP qualified drivers may be preloaded or available from the HP support Web site:

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

- HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
- Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro™ GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.
- AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
- As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready

### Technical Specifications - Graphics

content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

<b>Radeon™ Pro WX 9100 16GB Graphics</b>	<b>Form Factor</b>	Dual Slot (4.4" Height x 10.5" Length)
	<b>Graphics Controller</b>	Radeon™ Pro WX 9100 graphics GPU: 4096 Stream Processors Power: 250 Watts Cooling: Active
	<b>Memory</b>	16GB HBM2 memory Memory Bandwidth: Up to 483 GB/s Memory Width: 2048 bit
	<b>Connectors</b>	6x Mini DisplayPort 1.4 – HDR ready connectors with HBR3 and MST support.  Factory Configured: No video cable adapter included After market option kit: No video cable adapter included  Additional DisplayPort-to-VGA or DisplayPort-to-DVI adapters are available as Factory Configuration or Option Kit accessories.
	<b>Maximum Resolution</b>	8K support @ 60Hz Single monitor, single or dual-cable
	<b>Image Quality Features</b>	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
	<b>Display Output</b>	6 full physical mDP 1.4 HDR Ready outputs FreeSync support
	<b>GPU Architecture</b>	Vega™
	<b>Supported Graphics APIs</b>	DirectX® 12.1 OpenGL® 4.5 OpenCL™ 2.0 Vulkan™ 1.0
	<b>Available Graphics Drivers</b>	Windows 10 64-bit Windows 7 available from AMD Linux® 64-bit  HP qualified drivers may be preloaded or available from the HP support Web site:

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications - Graphics

<http://welcome.hp.com/country/us/en/support.html>

#### Notes

1. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.
2. Radeon VR Ready Creator Products are select Radeon Pro and AMD FirePro™ GPUs that meet or exceed the Oculus Rift or HTC Vive recommended specifications for video cards/GPUs. Other hardware (including CPU) and system requirements recommended by Oculus Rift or HTC Vive should also be met in order to operate the applicable HMDs as intended. As VR technology, HMDs and other VR hardware and software evolve and/or become available, these criteria may change without notice.
3. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro™ and Radeon™ Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.
4. As of September 2016, certified for DisplayPort™ 1.4 HBR3 and ready for DisplayPort™ 1.4 HDR based on independent verification by DisplayPort™ testing authority. HDR content requires that the system be configured with a fully HDR-ready content chain, including: graphics card, monitor/TV, graphics driver and application. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included

After market option kit: Two mDP-to-DP Adapters included

Additional mDP-to-DP Adapters are available as Factory Configuration or Option Kit accessories:

- 2MY05AA - HP miniDP-to-DP Adapter Cables
- 2KW87A6 - HP (Bulk 12) miniDP-to-DP Adapter Cables

<b>NVIDIA® Quadro® Sync II</b>	<b>Part number</b>	1WT20AA
	<b>Dimensions (HxD)</b>	6.0 inches × 4.2 inches
	<b>Devices Supported</b>	NVIDIA® Quadro® P4000 NVIDIA® Quadro® P5000 NVIDIA® Quadro® P6000
	<b>Bus Type</b>	Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector
	<b>PCI Form Factor</b>	Full Height, half length, single slot
	<b>Ports</b>	2 RJ45 connectors for carrying frame lock signals over CAT5 cables. BNC Connector for external house synchronization.
	<b>Internal Connectors</b>	6 NVIDIA SLI® style edge fingers for connection to compatible GPUs

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

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## Technical Specifications - Graphics

	<ul style="list-style-type: none"><li>• Included with the board are 4 12-Inch Short Sync Cables to connect to GPU's</li><li>• Included with the board are 2 24-Inch Long Sync Cables to connect to GPU's</li></ul>
System Requirements	Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector Must be used with NVIDIA Quadro P4000, P5000 or P6000 graphics cards. Requires Quadro driver version R375 or later.
Temperature - Operating	0° to 55° C
Temperature - Storage	-40° to 60° C
Relative Humidity - Operating	10% to 80%
Power Requirements	Board power dissipation: <15W
Operating Systems Supported	Windows 10 64-bit Windows 7 64-bit Linux® 64-bit
Kit Contents	Contains: <ul style="list-style-type: none"><li>• Quadro Sync II Card</li><li>• 4 x 12-Inch Short Sync Cables</li><li>• 2 x 24-Inch Long Sync Cables (Two)</li><li>• Quick Start Guide</li></ul>



### Technical Specifications – Optical and Removable Storage

#### OPTICAL AND REMOVABLE STORAGE

<b>HP 9.5mm Slim DVD Writer</b>	<b>Description</b>	9.5mm height, tray-load
	<b>Mounting Orientation</b>	Either horizontal or vertical
	<b>Interface Type</b>	SATA/ATAPI
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm
	<b>Supported Media Types</b>	DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW
	<b>Disc Capacity</b>	DVD-ROM 8.5 GB DL or 4.7 GB standard Full Stroke DVD < 200 ms (seek) Full Stroke CD < 200 ms (seek)
	<b>Maximum Data Transfer Rates</b>	CD ROM Read CD-ROM, CD-R Up to 24X CD-RW Up to 24X  DVD ROM Read DVD+RW Up to 8X DVD-RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X DVD-R Up to 8X
	<b>Power</b>	Source SATA DC power receptacle DC Power Requirements 5 VDC ± 5%-100 mV ripple p-p DC Current 5 VDC -< 800 mA typical, <1600 mA maximum
	<b>Operating Environmental (all conditions non-condensing)</b>	Temperature 41° to 122° F (5° to 50° C) Relative Humidity 10% to 80% Maximum Wet Bulb Temperature 84° F (29° C)
	<b>Operating Systems Supported</b>	Windows 10, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000, Windows XP Professional. Red Hat® Enterprise Linux® (RHEL) WS4**, 5, 6 Desktop/Workstation SUSE Linux® Enterprise Desktop 10 & 11
		* No driver is required for this device. Native support is provided by the operating system.
	<b>Kit Contents</b>	HP SATA DVD Writer drive, installation guide.

<b>Description</b>	9.5mm height, tray-load
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**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications – Optical and Removable Storage

<b>HP 9.5mm Slim DVD-ROM Drive</b>	<b>Mounting Orientation</b>	Either horizontal or vertical	
	<b>Interface Type</b>	SATA / ATAPI	
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm	
	<b>Disc Capacity</b>	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	<b>Access Times</b>	DVD-ROM Single Layer	< 110 ms (typical)
		CD-ROM Mode 1	< 110 ms (typical)
		Full Stroke DVD	< 230 ms (typical)
		Full Stroke CD	< 220 ms (typical)
	<b>Power</b>	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC $\pm$ 5%-100 mV ripple p-p
		DC Current	5 VDC – <800mA typical, < 1600 mA maximum
	<b>Operating Environmental (all conditions non-condensing)</b>	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 80%
		Maximum Wet Bulb Temperature	84° F (29° C)
	<b>Operating Systems Supported</b>	Windows 8.1, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000, Windows XP Professional. Red Hat® Enterprise Linux® (RHEL) WS4**, 5, 6 Desktop/Workstation SUSE Linux® Enterprise Desktop 10 & 11	
		No driver is required for this device. Native support is provided by the operating system.	
	<b>Kit Contents</b>	9.5mm Slim DVD-ROM Drive, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	

<b>HP 9.5mm Slim BDXL Blu-Ray Writer</b>	<b>Description</b>	9.5mm height, tray-load	
	<b>Mounting Orientation</b>	Either horizontal or vertical	
	<b>Interface Type</b>	SATA/ATAPI	
	<b>Dimensions (WxHxD)</b>	128 x 9.5 x 127mm	
	<b>Supported Media Types</b>	BD-ROM	
		BD-R	
		BD-RE	
		DVD+R	
		DVD+RW	
		DVD+R DL	
		DVD-R DL	
		DVD-R	
		DVD-RW	
		CD-R	
		CD-RW	
	<b>Disc Capacity</b>	DVD-ROM	8.5 GB DL or 4.7 GB standard
		Blu-ray	25 GB (single-layer) 50 GB (dual-layer)

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications – Optical and Removable Storage

		100/128 GB (BDXL)
	Full Stroke DVD	< 230 ms (seek)
	Full Stroke CD	< 220 ms (seek)
	Blu-ray	< 230 ms (seek) (Full Stroke Blu-ray)
	Startup Time	(Time to drive ready from tray loading)
		BD-ROM (SL/DL) 25S / 28S
		BD-R (SL/DL) 25S / 28S
		BD-RE (SL/DL) 25S / 28S
		DVD-ROM (SL/DL) 18S / 18S
		DVD-R (SL/DL) 25S / 25S
		DVD-RW 25S
		DVD+R (SL/DL) 25S / 25S
		DVD+RW 25S
		CD-ROM 15S
<b>Maximum Data Transfer Rates</b>	CD ROM Read	CD-ROM, CD-R Up to 24X
		CD-RW Up to 24X
	DVD ROM Read	DVD+RW Up to 8X
		DVD-RW Up to 8X
		DVD+R DL Up to 8X
		DVD-R DL Up to 8X
		DVD-ROM Up to 8X
		DVD-ROM DL Up to 8X
		DVD+R Up to 8X
		DVD-R Up to 8X
	Blu-ray	BD-ROM Up to 6X
		BD-ROM DL Up to 6X
		BD-R Up to 6X
		BD-R DL Up to 6X
		BD-R Up to 6X
		BD-RE SL/DL Up to 6X
<b>Power</b>	Source	SATA DC power receptacle
	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
	DC Current	5 VDC -900 mA typical, 2000mA maximum
<b>Operating Environmental (all conditions non-condensing)</b>	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 80%
	Maximum Wet Bulb Temperature	84° F (29° C)
<b>Operating Systems Supported</b>	Windows 8.1, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000.	
	Red Hat® Enterprise Linux® (RHEL) WS4**, 5, 6 Desktop/Workstation	
	SUSE Linux® Enterprise Desktop 10 & 11	
	No driver is required for this device. Native support is provided by the operating system.	
<b>Kit Contents</b>	9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide	

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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### Technical Specifications – Optical and Removable Storage

As Blu-ray is a new format containing new technologies, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.

<b>HP SD Card Reader</b>	<b>Description</b>	Supports hardware ECC (Error Correction Code) function Supports hardware CRC (Cyclic Redundancy Check) function Supports SD 4-bit parallel transfer mode
	<b>Interface Type</b>	USB 3.1 G1 High-speed interface
	<b>Dimensions (WxHxD)</b>	1.15 x .9 x .15 in (29.00 x 23.6 x 3.15 mm) Fits conveniently in the Front IO Bay
	<b>Supported Media Types</b>	Secure Digital Card (SD) Secure Digital High Capacity (SDHC) SD Extended Capacity Memory Card (SDXC) SD Ultra High Speed II (SD UHSII)
		These additional media types are supported with a card adapter.
		miniSD miniSD High Capacity
		Micro SD Memory Card (MicroSD) Micro SD High Capacity Memory Card (MicroSDHC)
		<a href="#">Test Parameters/Conditions - Power applied, unit operating on system ±5%</a>
	<b>Operating Systems Supported</b>	Windows 10
		No driver is required for this device. Native support is provided by the operating system.
	<b>Kit Contents</b>	SD card reader
	<b>Approvals</b>	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3, FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUVT
	<b>Weight</b>	0.35 lbs. (0.16 kg)

### Technical Specifications - Controller Cards

#### CONTROLLER CARDS

<b>HP Thunderbolt-3 Dual Port2 PCIe 1-port I/O Card</b>	<b>Data Transfer Rate</b>	Supports up to 40 Gb/s (40,000 Mb/s)
	<b>Devices Supported</b>	Thunderbolt™, Thunderbolt™ 2 and Thunderbolt™ 3 certified for Windows devices
	<b>Bus Type</b>	PCIe Slot. Slot 4 only
	<b>Ports</b>	Two Thunderbolt™ 3 external USB type-C output connectors (Rear) Two full size DisplayPort input connectors (Rear)
	<b>Internal Connectors</b>	One 2x5-Pin header connector
	<b>System Requirements</b>	Genuine Windows 10 Professional 64-bit, slot 4 PCH PCIe slot.
	<b>Temperature - Operating</b>	50° to 131° F (10° to 55° C)
	<b>Temperature - Storage</b>	-22° to 140° F (-30° to 60° C)
	<b>Relative Humidity - Operating</b>	20% to 80%
	<b>Compliances</b>	FCC Part 15B, cULus 60950, CE Mark EN55022B(1995)/EN55024-1998 STD, Taiwan BSMI CNS13438, Korea MIC
	<b>Operating Systems Supported</b>	Genuine Windows 10 Professional 64-bit.
	<b>Kit Contents</b>	HP Thunderbolt™ 3 Dual Port PCIe I/O Card, 2- DisplayPort cables, GPIO (General-Purpose Input/Output) cables, Installation documentation and warranty card.

\*Maximum speed requires DisplayPort™ and PCIe aggregation.

### Technical Specifications - Networking and Communications

#### NETWORKING AND COMMUNICATIONS

<b>Integrated Intel I219 PCIe GbE Controller</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Intel I219 GbE platform LAN connect networking controller
	<b>Data Rates Supported</b>	10/100/1000 Mbps
	<b>Boot ROM Support</b>	PXE, UEFI
	<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Amber = 100Mbps</li> <li>• Green = 1000Mbps</li> </ul>
<b>Management Capabilities</b> Wake-On-LAN, Intel® Active Management Technology™ (AMT) 11.1x		
<b>NOTE:</b> Intel® AMT™ is not available on Intel Core X configs.		

<b>Integrated Intel I210 (not available on Intel Core X configs)</b>	<b>Connector</b>	RJ-45
	<b>Controller</b>	Intel® I210
	<b>Data Rates Supported</b>	10/100/1000 Mbps
	<b>Boot ROM Support</b>	PXE, UEFI
	<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Amber = 100Mbps</li> <li>• Green = 1000Mbps</li> </ul>

**Management Capabilities** Wake-On-LAN

<b>Intel® I210-T1</b>	<b>Networking Interface</b>	RJ-45
	<b>System Interface</b>	PCI Express 2.1 x1
	<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps
	<b>Cabling (up to 100m)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
	<b>Power Consumption (active-typical)</b>	0.81W
	<b>Physical Dimensions</b>	Length: 6.7cm (2.64 inches) (Bracket) Width: 1.8cm (0.709 inches) Full-height end bracket: 12.07cm (4.755 inches) Low-profile end bracket: 8cm (3.15 inches)

### Technical Specifications - Networking and Communications

<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® I350-T2</b>	<b>Networking Interface</b>	2 x RJ-45
	<b>System Interface</b>	PCI Express 2.1 x4
	<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps
	<b>Cabling (up to 100m)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
	<b>Power Consumption (active-typical)</b>	4.4W
	<b>Physical Dimensions</b>	Length: 13.54cm (5.33 inches) Width: 6.89 (2.71 inches) Full-height end bracket: 12.0cm (4.725 inches) Low-profile end bracket: 7.92cm (3.117 inches)
	<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
	<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
	<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® I350-T4</b>	<b>Networking Interface</b>	4 x RJ-45
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**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Networking and Communications

<b>System Interface</b>	PCI Express 2.1 x4
<b>Networking Speeds Supported</b>	10Mbps, 100Mbps, 1Gbps
<b>Cabling (up to 100m)</b>	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
<b>Power Consumption (active-typical)</b>	5W
<b>Physical Dimensions</b>	Length: 13.54cm (5.33 inches) Width: 6.89 (2.71 inches) Full-height end bracket: 12.0cm (4.725 inches) Low-profile end bracket: 7.92cm (3.117 inches)
<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>
<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

<b>Intel® X550-T2</b>	<b>Networking Interface</b>	2 x RJ-45
	<b>System Interface</b>	PCI Express 3 x4
	<b>Networking Speeds Supported</b>	100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps
	<b>Cabling (up to 100m)</b>	Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps Cat6a (or higher) for 10Gbps
	<b>Power Consumption (active-typical)</b>	3.9W at 100Mbps 5.5W at 1Gbps 11.2W at 10Gbps
	<b>Physical Dimensions</b>	5.2 in x 2.7 in (without bracket)
	<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Amber = &lt;10Gbps</li> <li>• Green = 10Gbps</li> </ul>

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors. See the Supported Configuration section for supported configurations.

### Technical Specifications - Networking and Communications

<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

#### Intel® X710-DA2 10GBASE-SR Converged Network Adapter

<b>Networking Interface</b>	2 SFP+ Ports for LC SFP+ Transceivers
<b>System Interface</b>	PCI Express 3.0 x8
<b>Networking Speeds Supported</b>	1Gbps, 10Gbps
<b>Cabling</b>	LC fiber optic cabling with LC SFP+ Transceivers
<b>Power Consumption (active-typical)</b>	4.3W
<b>Physical Dimensions</b>	6.578 in x 2.703 in
<b>Connect Speed LED Indicators</b>	Link/Activity LED <ul style="list-style-type: none"> <li>• Off = No link</li> <li>• Blinking = Activity</li> </ul> Speed LED <ul style="list-style-type: none"> <li>• Off = 10Mbps</li> <li>• Green = 100Mbps</li> <li>• Amber = 1Gbps</li> </ul>

<b>Operating Temperature</b>	0 °C to 55 °C (32 °F to 131 °F)
<b>Hardware Certifications</b>	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003

**Note:** Windows 7 is NOT supported

#### 10GbE SFP+ SR Transceiver

<b>Connector Type</b>	LC
<b>Cable Type</b>	62.5/125um or 50/125um (core/cladding), graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively.
<b>Cable Length</b>	2-300m
<b>Wavelength</b>	850nm
<b>Form Factor</b>	SFP+
<b>Physical Dimensions</b>	0.47(h) x 0.54(w) x 2.19(d) inches (1.19 x 1.38 x 5.57 cm)
<b>Operating Temperature</b>	0C to 45C (32F to 113F)
<b>Operating Humidity</b>	0% to 85%, noncondensing

**Note:** Features and supported configurations will differ between the Z4 G4 Workstations with Intel® Xeon® W processors and with Intel® Core™ X-Series processors.

See the Supported Configuration section for supported configurations.

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## Technical Specifications - Networking and Communications

Intel® 8265 WLAN	Networking Speeds	802.11ac MU-MIMO (up to 867 Mbps) Bluetooth 4.2
	IEEE WLAN Standard	IEEE 802.11a/b/g/n/ac, 802.11d, 802.11e, 802.11h, 802.11i, 802.11w; 802.11r, 802.11k, 802.11v pending
	Bluetooth	4.2
	System Interface	PCI Express 2.1 x1
	Antenna	2x2

### Summary of Changes

#### SUMMARY OF CHANGES

Date of change:	Version History:		Description of change:
November 1, 2017	From v1 to v2	Added	HP DisplayPort to HDMI Adapter, NVIDIA SLI 2-slot Graphics Connector and NVIDIA Quadro Sync II to Graphics section
		Changed	Graphics, Storage / Hard Drives and Memory sections, changed Front and internal view info on the Overview section, changed Operating Systems section, changed System Board section, changed System Configuration, DECLARED NOISE EMISSIONS and Physical Security and Serviceability sections
November 29, 2017	From v2 to v3	Added	Processors, hard drives and graphics to offerings, added Intel Xeon W-2195 to Processors section
		Changed	Wattage links on power supply section updated and Voltage links on efficiency section updated
February 5, 2018	From v3 to v4	Added	Features and Supported Configurations for Intel® Core™ X- Series Processor Family
		Changed	Formatting
February 27, 2018	From v4 to v5	Added	Intel Core i9-X processors footnotes added to processors pre-installed section
March 27, 2018	From v5 to v6	Added	NVIDIA Quadro GP100 16GB Graphics, NVIDIA Quadro GV100 32GB Graphics and AMD Radeon Pro WX 9100 16GB Graphics as High End 3D in Graphics section
August 13, 2018	From v6 to v7	Added	Footnote to Networking and Communications section
		Changed	Operating Systems section
August 24, 2018	From v7 to v8	Changed	Format
September 21, 2018	From v8 to v9	Added	Intel Optane SSD 905p AiC 280GB & 480GB
September 26, 2018	From v9 to v10	Changed	NVIDIA Quadro P6000 Graphics specs
February 11, 2019	From v10 to v11	Added	NVIDIA Quadro RTX 5000 16GB and NVIDIA Quadro RTX 6000 24GB Graphics, added Intel Core i9-9980XE, Intel Core i9-9920X, Intel Core i9-9820X and Intel Core i7-9800X processors
		Changed	Storage section and Format changes

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