Overview

HP Z8 G4 Workstation



Front view

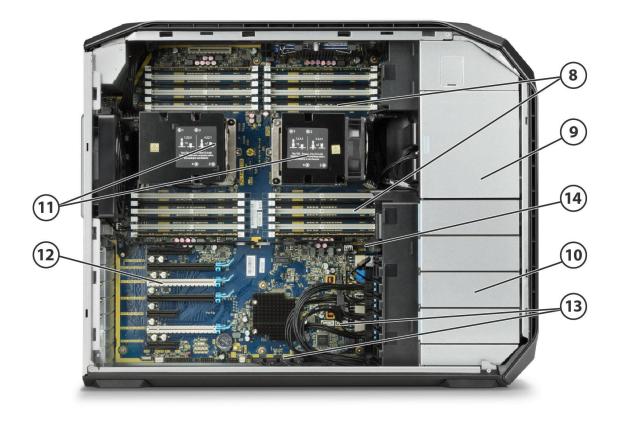
- 1. Integrated Front Handle
- 2. Dedicated 9.5mm Optical Drive Bay
- 3. Power Button
- 4. HDD Activity LED

- Front I/O Entry: 4 USB 3.1 Gen1 (Left-most Port has Charging Capability)
 Front I/O Premium: 2x USB 3.1 Gen1, 2x USB 3.1 Gen2 Type-C[™] (Left-most Type-A Port has Charging Capability)
 Note: Premium Front IO is shown on Photography
- 6. Media Card Reader
- 7. 1 Headset



HP Z8 G4 Workstation

Overview



Internal view

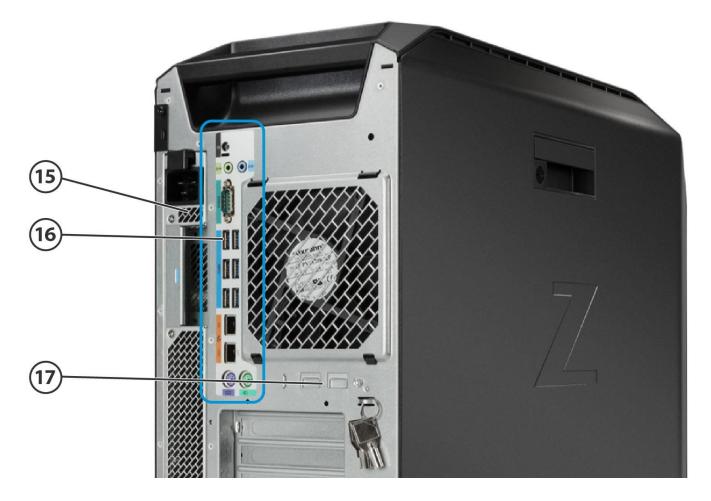
12.

- 8. 24 DIMM Slots for DDR4 ECC Memory
- 9. 2 External 5.25" Bays and Slimline Optical
- 10. 4 Internal 3.5" Bays
- 11. 2 Intel[®] Xeon[®] Processors (Skylake SP) family

- Slot 1: PCIe Gen3 x4 Transforms to PCIe Gen3 x8 when 2nd CPU is installed
- Slot 2: PCIe Gen3 x16
- Slot 3: PCIe Gen3 x16 Available ONLY when 2nd processor is installed
- Slot 4: PCIe Gen3 x16
- Slot 5: PCIe Gen3 x4
- Slot 6: PCIe Gen3 x16 Available ONLY when 2nd processor is installed
- Slot 7: PCIe Gen3 x4
- 13. 2 sSATA, 8 SATA (AHCI) Ports
- 14. 3 USB 2.0 Internal Ports, 1 USB 3.0 Gen1 Internal Port



Overview



Rear view

- 15. Choice of 1125W or 1450W, 90% Efficient Power Supplies
- 16. Rear I/O:

Rear Power Button 6 USB 3.1 Gen1 1 Serial PS/2 keyboard and mouse 2 RJ-45 to integrated Gigabit LAN 1 Audio Line-In (can be retasked as microphone) 1 Audio Line-Out

17. Optional: 2 10GbE LAN ports



Form Factor Operating Systems Tower Preinstalled:

- Windows 10 Pro 64 for Workstations¹
- 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:

- Windows 7 Professional 64-bit²
- Red Hat[®] Enterprise Linux[®] Desktop 7.4³
- SUSE Linux[®] Enterprise Desktop 12 SP3³
- Ubuntu 16.04 LTS³

¹Not 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.

²For detailed Windows 7 OS hardware support information see http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf. Intel Xeon® SP Processors: Platinum 8100, Gold 6100, Gold 5100, Silver 4100, & Bronze 3100 Family support Microsoft Windows 7 Professional 64-bit.

³**Notes:** For detailed Linux[®] OS/hardware support information, see: http://www.hp.com/support/linux_hardware_matrix

Available Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MT/s)	Hyper- Threading	Intel® Turbo Boost Technology ¹	Supports Intel® DCPMM® Technology ²	TDP (W)
Intel® Xeon® Platinum 8280 processor	28	2.7 GHz	38.5	2933	YES	3.3, 4.0	YES	205
Intel® Xeon® Platinum 8260M processor	24	2.4 GHz	35.75	2933	YES	3.1, 3.9	YES	165
Intel® Xeon® Platinum 8260 processor	24	2.4 GHz	35.75	2933	YES	3.1, 3.9	YES	165
Intel® Xeon® Platinum 8180 processor	28	2.5GHz	38.50	2666	YES	3.2, 3.8	NO	205
Intel® Xeon® Platinum 8160M processor	24	2.1GHz	33.00	2666	YES	2.8, 3.7	NO	150
Intel® Xeon® Platinum 8160 processor	24	2.1GHz	33.00	2666	YES	2.8, 3.7	NO	150
Intel® Xeon® Gold 6254 processor	18	3.1 GHz	24.75	2933	YES	3.9, 4.0	YES	200
Intel® Xeon® Gold 6252 processor	24	2.1 GHz	35.75	2933	YES	2.8, 3.7	YES	150
Intel® Xeon® Gold 6248 processor	20	2.5 GHz	27.5	2933	YES	3.2, 3.9	YES	150
Intel® Xeon® Gold 6244 processor	8	3.6 GHz	24.75	2933	YES	4.3, 4.4	YES	150





Overview

		1	1	1	1	1	1	1
Intel® Xeon® Gold 6242 processor	16	2.6 GHz	22	2933	YES	3.5, 3.9	YES	150
Intel® Xeon® Gold 6240Y processor	18	2.6 GHz	24.75	2933	YES	3.3, 3.9	YES	150
Intel® Xeon® Gold 6240 processor	18	2.6 GHz	24.75	2933	YES	3.3, 3.9	YES	150
Intel® Xeon® Gold 6230 processor	20	2.1 GHz	27.5	2933	YES	2.8, 3.9	YES	125
Intel® Xeon® Gold 6152 processor	22	2.1GHz	30.25	2666	YES	2.8, 3.7	NO	140
Intel® Xeon® Gold 6154 processor	18	3.0GHz	24.75	2666	YES	3.7, 3.7	NO	200
Intel® Xeon® Gold 6148 processor	20	2.4GHz	27.50	2666	YES	3.1, 3.7	NO	150
Intel® Xeon® Gold 6146M processor	12	3.2GHz	24.75	2666	YES	3.9, 4.2	NO	165
Intel® Xeon® Gold 6146 processor	12	3.2GHz	24.75	2666	YES	3.9, 4.2	NO	165
Intel® Xeon® Gold 6144M processor	8	3.5GHz	24.75	2666	YES	4.1, 4.2	NO	150
Intel® Xeon® Gold 6144 processor	8	3.5GHz	24.75	2666	YES	4.1, 4.2	NO	150
Intel® Xeon® Gold 6142M processor	16	2.6GHz	22.00	2666	YES	3.3, 3.7	NO	150
Intel® Xeon® Gold 6142 processor	16	2.6GHz	22.00	2666	YES	3.3, 3.7	NO	150
Intel® Xeon® Gold 6140M processor	18	2.3GHz	24.75	2666	YES	3.0, 3.7	NO	140
Intel® Xeon® Gold 6140 processor	18	2.3GHz	24.75	2666	YES	3.0, 3.7	NO	140
Intel® Xeon® Gold 6138 processor	20	2GHz	27.5	2666	YES	2.7, 3.7	NO	125
Intel® Xeon® Gold 6136 processor	12	3.0GHz	24.75	2666	YES	3.6, 3.7	NO	150
Intel® Xeon® Gold 6134M processor	8	3.2GHz	24.75	2666	YES	3.7, 3.7	NO	130
Intel® Xeon® Gold 6134 processor	8	3.2GHz	24.75	2666	YES	3.7, 3.7	NO	130
Intel® Xeon® Gold 6132 processor	14	2.6GHz	19.25	2666	YES	3.3, 3.7	NO	140
Intel® Xeon® Gold 6130 processor	16	2.1GHz	22.00	2666	YES	2.8, 3.7	NO	125
Intel® Xeon® Gold 6128 processor	6	3.4GHz	19.25	2666	YES	3.7, 3.7	NO	115
Intel® Xeon® Gold 6126 processor*	12	2.6GHz	19.25	2666	YES	3.3, 3.7	NO	125
Intel® Xeon® Gold 5222 processor	4	3.8 GHz	16.5	2933	YES	3.9, 3.9	YES	105
Intel® Xeon® Gold 5220 processor	18	2.2 GHz	24.75	2933	YES	2.7, 3.9	YES	105
Intel® Xeon® Gold 5218 processor	16	2.3 GHz	22	2933	YES	2.8, 3.9	YES	125
Intel® Xeon® Gold 5215M processor	10	2.5 GHz	13.75	2933	YES	3.0, 3.4	YES	85
Intel® Xeon® Gold 5215 processor	10	2.5 GHz	13.75	2933	YES	3.0, 3.4	YES	85



Overview

Intel® Xeon® Gold 5120 processor	14	2.2GHz	19.25	2400	YES	2.6, 3.2	NO	105
ntel® Xeon® Gold 5118 processor	12	2.3GHz	16.50	2400	YES	2.7, 3.2	NO	105
ntel® Xeon® Gold 5115 processor	10	2.4	13.75	2400	YES	2.8, 3.2	NO	85
ntel® Xeon® Gold 5122	4	3.6GHz	16.50	2666	YES	3.7, 3.7	NO	105
rocessor ntel® Xeon® Silver 4216 rocessor	16	2.1 GHz	22	2933	YES	2.7, 3.2	NO	100
ntel® Xeon® Silver 4215	8	2.5 GHz	11	2933	YES	3.0, 3.5	YES	85
rocessor htel® Xeon® Silver 4214Y	12	2.2 GHz	16.5	2933	YES	2.7, 3.2	NO	105
rocessor htel® Xeon® Silver 4214	12	2.2 GHz	16.5	2933	YES	2.7, 3.2	NO	85
rocessor ntel® Xeon® Silver 4210 rocessor ³	10	2.2 GHz	13.75	2933	YES	2.7, 3.2	NO	85
ntel® Xeon® Silver 4208 rocessor ³	8	2.1 GHz	11	2933	YES	2.5, 3.2	NO	85
ntel® Xeon® Silver 4116 rocessor	12	2.1GHz	16.50	2400	YES	2.4, 3.0	NO	85
ntel® Xeon® Silver 4114 processor	10	2.2GHz	13.75	2400	YES	2.5, 3.0	NO	85
ntel® Xeon® Silver 4112 processor	4	2.6GHz	8.25	2400	YES	2.9, 3.0	NO	85
ntel® Xeon® Silver 4110 processor	8	2.1GHz	11.00	2400	YES	2.4, 3.0	NO	85
ntel® Xeon® Silver 4108 processor	8	1.8GHz	11.00	2400	YES	2.1, 3.0	NO	85
ntel [®] Xeon [®] Bronze 3204 processor ³	6	1.9 GHz	8.25	2933	YES	N/A	NO	85
ntel® Xeon® Bronze 3106 processor	8	1.7GHz	11.00	2133	NO	N/A	NO	85
ntel® Xeon® Bronze 3104 processor	6	1.7GHz	8.25	2133	NO	N/A	NO	85
	¹ The specif core maxin not have tu	ications show num turbo st Irbo function	wn in this co eps). Turbo I Iality are der	boost steppi noted as N/A.	ent the following occurs in	ving: (all core m 100MHz increme public sector cus	ents. Processo	rs that do

²Intel[®] Data Center Persistent Memory Modules availability will be announced at a future date. ³ Available May 2019

Available Processors

Disclaimers

When ordering two processors, the second processor must be the same as the first. Intel processor numbers are not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families.



Overview	
Color	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. Black
Convertibility	No
Expansion Slots (see system board section for more details)	Slot 1:PCle Gen3 x4 - Transforms to PCle Gen3 x8 when 2nd CPU is installedSlot 2:PCle Gen3 x16Slot 3:PCle Gen3 x16 - Available ONLY when 2nd processor is installedSlot 4:PCle Gen3 x16Slot 5:PCle Gen3 x4Slot 6:PCle Gen3 x16 - Available ONLY when 2nd processor is installedSlot 6:PCle Gen3 x16 - Available ONLY when 2nd processor is installedSlot 5:PCle Gen3 x4Note: The PCle x4 and PCle x8 connectors above are open ended, allowing a PCle x16 card to be seated
Expansion Bays (see storage section for more details)	in the slot. 4 internal 3.5" bays (All 4 include acoustic dampening rail assemblies) 2 external 5.25" bays (175mm depth limit) 1 dedicated 9.5mm slim optical disk drive bay
Front I/O Internal I/O	 Base: 4 USB 3.1 Gen1 Type-A connector. Left most connector has charging capability, 1 Combo Headset, 1 Optional Media Card Reader Premium: 2 USB 3.1 Gen1 Type-A connector. Left most connector has charging capability, 2 USB 3.1 Gen2 Type-C[™] connector, 1 Combo Headset, 1 Optional Media Card Reader Internal Slot 1 CPU1: PCIe Gen3 x8 - always available Internal Slot 2 CPU2: PCIe Gen3 x8 - available when 2nd CPU is installed
	2 USB 2.0 ports available with a single 2x5 header 1 USB 2.0 port available with a 1x6 header 1 USB 3.1 Gen1 and 1 USB 2.0 port available with a 2x6 header Notes: The 2x5 header can be converted to a standard (Type-A) USB 2.0 connector through the use of one HP Internal USB Port Kit (EM165AA). This port kit uses one half of the 2x5 header. The 1x6 header can be converted to a standard (Type-A) USB 2.0 connector through the use of one HP Internal USB Port Kit (EM165AA). This port kit uses one half of the 2x5 header.



Overview		
	through the u	er can be converted to a standard (Type-A) USB 2.0 connector ise of one HP Internal USB Port Kit (EM165AA). This port kit of the 2x6 header.
Rear I/O		n1 (aka USB 3.0), 1 Serial, PS/2 keyboard and mouse, 2 RJ-45 to integrated Gigabit LAN, 1 (can be retasked as microphone), 1 Audio Line-Out
	Optional: 2 R.	I-45 to 10GbE LAN ports
Interfaces Supported	Factory integ	ATA 6.0 Gb/s interface rated RAID available for SATA drives (RAID 0, 1 and 10) 3.1 Gen1, USB 3.1 Gen2, USB 2.0
On-board RAID Support		Mirrored Array Striped/Mirrored
Chassis Dimensions (H x W x D)	Footprint:	H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.7" [551.2mm] (measured to the rear of service panel)
	Maximum:	H: 17.5" [444.5mm] W: 8.5" [215.9mm] D: 21.85" [555.2mm] (measured to the embossment for the rear chassis fans)
Packaged Dimensions	H: 25" (636m) W: 13.1" (332 D: 28.9" (734)	mm)
Rack Dimensions	50	
Weight		
Temperature		to 35°C (40° to 95°F) g: -40° to 60°C (-40° to 140°F)
Humidity		perating: 10% to 85% RH, non-condensing, 35° C maximum wet bulb g: 10% to 90%, non-condensing, 35° C maximum wet bulb
Maximum Altitude (non- pressurized)		048m (10,000ft) g: 9,144m (30,000ft)
Power Supply		1524 m (5,000 feet) altitude, maximum operating temperature is reduced by 1° C (1.8° F) 000 feet) elevation increase
rower Suppry	1125W/100V	/15A 90% Efficient wide-ranging, active Power Factor Correction livery system includes four 6+2-pin graphics power cables.
	system incluc	/10A 90% Efficient wide-ranging, active Power Factor Correction The power delivery les four 6+2-pin graphics power cables. lable in limited regions
		/20A 90% Efficient wide-ranging, active Power Factor Correction livery system includes four 6+2-pin graphics power cables.



HP Z8 G4 Workstation

QuickSpecs

Overview

1700W/200V/10A 90% Efficient wide-ranging, active Power Factor Correction The power delivery system includes four 6+2-pin graphics power cables. Notes: The 1125W/100V/15A (1450W at 200V Input Voltage) power supply can also supply 1275W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1125W. An uninterruptible power supply (UPS) is highly recommended if 1275W output power is desired. The 1125W Power Supply can also supply 1450W of output power when the input voltage is greater than 200V under all conditions. The 1450W/100V/20A (1700W at 200V Input Voltage) power supply can also supply 1550W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1450W. An uninterruptible power supply (UPS) is highly recommended if 1550W output power is desired. The 1450W Power Supply can also supply 1700W of output power when the input voltage is greater than 200V under all conditions. The 1450W/100V/20A chassis is shipped with a 20A power cord and requires a 20A outlet in an environment with 100V/110V. Site modification may be required. Check with your sales lead and click here for the Site Prep Guide. The Z8 G4 power supply efficiency reports can be found at these links: 1125W - Link: https://pluqloadsolutions.com/psu_reports/HP%20Inc_DPS-1125BB%20A 1125W ECOS%204825 Report.pdf 1450W - Link: https://plugloadsolutions.com/psu_reports/HP%20Inc_DPS-1450AB%20A_1450W_ECOS%204826_Report.pdf

Workstation ISV Certifications See the latest list of certifications at http://www.hp.com/united-states/campaigns/workstations/partnerships.html



Supported Components

Processors

Intel® Xeon® processor Scalable family	Factory Configured	Option Kit	Kit Part Number	Support Notes	
Intel® Xeon® Platinum 8280 processor	Y	Y	5YZ53AA	1	
Intel [®] Xeon [®] Platinum 8260M processor	Y	Y	5YZ52AA	1	
Intel [®] Xeon [®] Platinum 8260 processor	Y	Y	5YZ51AA	1	
Intel® Xeon® Platinum 8180 processor	Y	Y	1XM54AA		
Intel [®] Xeon [®] Platinum 8160M processor	Y	Y	1XM55AA		
Intel [®] Xeon [®] Platinum 8160 processor	Y	Y	1XM56AA		
Intel [®] Xeon [®] Gold 6254 processor	Y	Y	5YZ50AA	1	
Intel [®] Xeon [®] Gold 6252 processor	Y	Y	5YZ49AA	1	
Intel [®] Xeon [®] Gold 6248 processor	Y	Y	5YZ48AA	1	
Intel [®] Xeon [®] Gold 6244 processor	Y	Y	5YZ47AA	1	
Intel [®] Xeon [®] Gold 6242 processor	Y	Y	5YZ46AA	1	
Intel [®] Xeon [®] Gold 6240Y processor	Y	Y	5YZ45AA	1	
Intel [®] Xeon [®] Gold 6240 processor	Y	Y	5YZ44AA	1	
Intel [®] Xeon [®] Gold 6230 processor	Y	Y	5YZ41AA	1	
Intel [®] Xeon [®] Gold 6152 processor	Y	Y	1XM57AA		
Intel [®] Xeon [®] Gold 6154 processor	Y	Y	1XM58AA		
Intel [®] Xeon [®] Gold 6148 processor	Y	Y	1XM59AA		
Intel [®] Xeon [®] Gold 6146 processor	Y	Y	2RX97AA		
Intel [®] Xeon [®] Gold 6144 processor	Y	Y	2RX96AA		
Intel [®] Xeon [®] Gold 6142M processor	Y	Y	1XM60AA		
Intel [®] Xeon [®] Gold 6142 processor	Y	Y	1XM61AA		
Intel [®] Xeon [®] Gold 6140M processor	Y	Y	1XM63AA		
Intel [®] Xeon [®] Gold 6140 processor	Y	Y	1XM64AA		
Intel [®] Xeon [®] Gold 6138 processor	Y	Y	3GG97AA		
Intel [®] Xeon [®] Gold 6136 processor	Y	Y	1XM62AA		
Intel [®] Xeon [®] Gold 6134M processor	Y	Y	1XM65AA		
Intel [®] Xeon [®] Gold 6134 processor	Y	Y	1XM66AA		
Intel [®] Xeon [®] Gold 6132 processor	Y	Y	1XM67AA		
Intel [®] Xeon [®] Gold 6130 processor	Y	Y	1XM68AA		
Intel [®] Xeon [®] Gold 6128 processor	Y	Y	1XM69AA		
Intel [®] Xeon [®] Gold 6126 processor**	Y	Y	5SC22AV		
Intel [®] Xeon [®] Gold 5222 processor	Y	Y	5YZ39AA	1	
Intel [®] Xeon [®] Gold 5220 processor	Y	Y	5YZ38AA	1	
Intel [®] Xeon [®] Gold 5218 processor	Y	Y	5YZ37AA	1	
Intel® Xeon® Gold 5215M processor	Y	Y	5YZ36AA	1	
Intel® Xeon® Gold 5215 processor	Y	Y	5YZ35AA	1	
Intel [®] Xeon [®] Gold 5120 processor	Y	Y	1XM70AA		
Intel® Xeon® Gold 5118 processor	Y	Y	1XM71AA		
Intel [®] Xeon [®] Gold 5122 processor	Y	Y	1XM72AA		
Intal® Vaan® Cold 1216 processor	v	v	EV72444		

Υ

Υ

5YZ34AA



Option



Intel[®] Xeon[®] Gold 4216 processor



Intel [®] Xeon [®] Gold 4215 processor	Y	Y	5YZ33AA	1
Intel [®] Xeon [®] Gold 4214Y processor	Y	Y	5ZB34AA	
Intel [®] Xeon [®] Gold 4214 processor	Y	Y	5YZ32AA	
Intel [®] Xeon [®] Gold 4210 processor	Y	Y	5YZ31AA	2
Intel [®] Xeon [®] Gold 4208 processor	Y	Y	5YZ30AA	2
Intel [®] Xeon [®] Silver 4116 processor	Y	Y	1XM73AA	
Intel [®] Xeon [®] Silver 4114 processor	Y	Y	1XM74AA	
Intel [®] Xeon [®] Silver 4112 processor	Y	Y	1XM75AA	
Intel [®] Xeon [®] Silver 4110 processor	Y	Y	3GG96AA	
Intel [®] Xeon [®] Silver 4108 processor	Y	Y	1XM76AA	
Intel [®] Xeon [®] Gold 3204 processor	Y	Y	5YZ29AA	2
Intel [®] Xeon [®] Bronze 3106 processor	Y	Y	1XM77AA	
Intel [®] Xeon [®] Bronze 3104 processor	Y	Y	1XM78AA	
1 Options kits available for second processor up	grado			

¹ Options kits available for second processor upgrade.

Disclaimers: When ordering two processors, the second processor must be the same as the first. Intel processor numbers are not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families.

Note 1: Intel[®] DCPMM[®] (Data Center Persistent Memory) Supported. Availability will be announced at a future date. **Note 2:** Available May 2019

**Intel® Xeon® Gold 6126 processor (selected North America public sector customers only), Availability date TBD.

Monitors / Displays		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	HP Z Display Z22n G2		Y	1JS05AA	
	HP Z Display Z23n G2		Y	1JS06AA	
	HP Z Display Z24i G2		Y	1JS08AA	
	HP Z Display Z24n G2		Y	1JS09AA	
	HP Z Display Z24nf G2		Y	1JS07AA	
	HP Z Display Z27n G2		Y	1JS10AA	
	HP Z Display Z27s (4K display)		Y	J3G07AA	
	Supported by all operating systems available from HP Screen size measured diagonally				

Storage / Hard Drives

SAS Hard Drives	SAS Hard Drives for HP Workstations	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	HP 300GB 15k SAS SFF NOTE: SAS controller add-in card required	Y	Y	L5B74AA	
	Norte. SAS controller add in card required				

SATA Hard Drives		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	SATA (Serial ATA) Hard Drives for HP Workstations				
	500GB SATA 7200RPM 6Gb/s 3.5" HDD	Y	Y	LQ036AA	
	500GB SATA 7200RPM 6Gb/s OPAL2 SFF 3.5" HDD	Y	Y	D8N29AA	
	1TB SATA 7200RPM 3.5" HDD	Y	Y	LQ037AA	
	1TB SATA 7200RPM Ent 3.5" HDD	Y	Y	WOR10AA	
	2TB SATA 7200RPM HDD	Y	Y	QB576AA	
	4TB SATA 7200RPM Ent 3.5" HDD	Y	Y	K4T76AA	
	6TB SATA 7200RPM Ent 3.5" HDD	Y	Y	3DH90AA	
	NOTES:				
	Up to (5) 3.5-inch 7200 rpm SATA drives: 500 GB, 1.0, 2	.0, 4.0 TB; 20TE	8 max total		



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

PCIe Solid State Drives		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	PCIe SSDs for HP Workstations				
	HP Z Turbo Drive 256GB MLC Z8G4 SSD Module	Y	Y	1PD50AA	
	HP Z Turbo Drive 512GB MLC Z8G4 SSD Module	Y	Y	1PD51AA	
	HP Z Turbo Drive 1TB MLC Z8G4 SSD Module	Y	Y	1PD52AA	
	HP Z Turbo Drive 256GB TLC Z8G4 SSD Module	Y	Y	1PD53AA	
	HP Z Turbo Drive 512GB TLC Z8G4 SSD Module	Y	Y	1PD54AA	
	HP Z Turbo Drive 1TB TLC Z8G4 SSD Module	Y	Y	1PD55AA	
	HP Z Turbo Drive 2TB TLC Z8G4 SSD Module	Y	Y	3KP41AA	
	HP Z Turbo Drive 256GB SED Z8G4 SSD Module	Y	Y	2SA34AA	
	HP Z Turbo Drive 512GB SED Z8G4 SSD Module	Y	Y	2SA36AA	
	HP Z Turbo Drive 256GB MLC Z8 G4 SSD Kit	Y	Y	1PD44AA	
	HP Z Turbo Drive 512GB MLC Z8 G4 SSD Kit	Y	Y	1PD45AA	
	HP Z Turbo Drive 1TB MLC Z8 G4 SSD Kit	Y	Y	1PD46AA	
	HP Z Turbo Drive 256GB TLC Z8 G4 SSD Kit	Y	Y	1PD47AA	
	HP Z Turbo Drive 512GB TLC Z8 G4 SSD Kit	Y	Y	1PD48AA	
	HP Z Turbo Drive 1TB TLC Z8 G4 SSD Kit	Y	Y	1PD49AA	
	HP Z Turbo Drive 2TB TLC Z8 G4 SSD Kit	Y	Y	3KP40AA	
	HP Z Turbo Drive 256GB SED Z8 G4 SSD Kit	Y	Y	2SA33AA	
	HP Z Turbo Drive 512GB SED Z8 G4 SSD Kit	Y	Y	2SA35AA	
	HP Z Turbo Drive Dual Pro				
	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	
	HP Z Turbo Drive Quad Pro				



Supported Components

HP Z Turbo Drive Quad Pro 2x256GB PCIe TLC SSD	Y	Y	4YZ38AA	1
HP Z Turbo Drive Quad Pro 2x512GB PCIe TLC SSD	Y	Y	4YZ39AA	1
HP Z Turbo Drive Quad Pro 2x1TB PCIe TLC SSD	Y	Y	4YZ40AA	1
HP Z Turbo Drive Quad Pro 2x2TB PCIe TLC PCIe SSD	Y	Y	3KP42AA	
HP Z Turbo Drive Quad Pro 256GB TLC SSD module	Ν	Y	4YZ35AA	2
HP Z Turbo Drive Quad Pro 512GB TLC SSD module	Ν	Y	4YZ36AA	2
HP Z Turbo Drive Quad Pro 1TB TLC SSD module	Ν	Y	4YZ37AA	2
HP Z Turbo Drive Dual Pro				
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	
Intel® 905p Series SSD (Opatane SSD)				
Intel® Optane SSD 905p 280GB AiC**,***	Y	Y	2SC47AA	
Intel® Optane SSD 905p 480GB AiC**,***	Y	Y	2SC48AA	

NOTE 1: Dual M.2 SSD modules plus carrier

NOTE 2: M.2 SSD module only, designed to be installed into Quad Pro carrier

*For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30GB of system disk is reserved for system recovery software ** PCIe card installed in standard PCIe x4 slot *** Intel® Optane SSD Available Fall 2018

Hard Drive Controllers		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	SAS Controller				
	MicroSemi SmartHBA2100-4i4e SAS Controller	Y	Y	1FV90AA	

Graphics

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported # of cards
Graphics Cable Adapters					
HP miniDP-to-DP Adapter	Y	Y			
HP miniDP-to-DP Adapter (2-pack)	Y	Ν			
HP miniDP-to-DP Adapter (4-pack)	Y	Ν			
HP miniDP-to-DP Adapter (8-pack)	Y	Ν			
HP DisplayPort to Dual Link DVI Adapter	Y	Y	NR078AA		
HP DisplayPort to DVI-D Adapter	Y	Y	FH973AA		
HP DisplayPort to DVI-D Adapter (2-pack)	Y	Ν			
HP DisplayPort to DVI-D Adapter (4-pack)	Y	Ν			
HP DisplayPort to DVI-D Adapter (6-pack)	Y	Ν			
HP DisplayPort to VGA Adapter	Y	Y	AS615AA		



Supported Components

HP DisplayPort to HDMI Adapter	Y	Y	K2K92AA	
NVIDIA SLI 2-slot Graphics Connector	Y	Y	2YY84AA	
Entry 3D				
NVIDIA [®] Quadro [®] P400 2GB Graphics	Y	Y	1ME43AA	2
NVIDIA [®] Quadro [®] P600 2GB Graphics	Y	Y	1ME42AA	2
NVIDIA [®] Quadro [®] P620 2GB Graphics	Y	Y	3ME25AA	2
AMD FirePro™ W2100 2GB Graphics	Y	Y	J3G91AA	2
Mid-range 3D				
NVIDIA [®] Quadro [®] P1000 4GB Graphics	Y	Y	1ME01AA	4
NVIDIA [®] Quadro [®] P2000 5GB Graphics	Y	Y	1ME41AA	4
AMD Radeon™ Pro WX 3100 4GB Graphics	Y	Y	2TF08AA	4
AMD Radeon™ Pro WX 4100 4GB Graphics	Y	Y	ZOB15AA	4
High End 3D				
NVIDIA [®] Quadro [®] P4000 8GB Graphics	Y	Y	1ME40AA	3
NVIDIA [®] Quadro [®] P5000 16GB Graphics	Y	Y	ZOB13AA	3
NVIDIA [®] Quadro [®] P6000 24GB Graphics	Y	Y	ZOB12AA	3
NVIDIA [®] Quadro RTX 4000 8GB Graphics	Y	Y	5JV89AA	3
NVIDIA [®] Quadro RTX 5000 16GB Graphics	Y	Y	5JH81AA	2
NVIDIA [®] Quadro RTX 6000 24GB Graphics	Y	Y	5JH80AA	2
NVIDIA [®] Quadro [®] GP100 16GB Graphics	Y	Y	1ZE81AA	3
NVIDIA [®] Quadro [®] GV100 32GB Graphics	Y	Y	3ME26AA	2
AMD Radeon™ Pro WX 7100 8GB Graphics	Y	Y	ZOB14AA	3
AMD Radeon™ Pro WX 9100 16GB Graphics	Y	Y	2TF01AA	2
NVIDIA® Quadro® Sync II	Y	Y	1WT20AA	

Memory		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	DDR4-2666 ECC Registered DIMMs				
	8GB (1x8GB) DDR4-2666 ECC Reg Memory	Y	Y	1XD84AA	1, 3
	16GB (1x16GB) DDR4-2666 ECC Reg Memory	Ν	Y	1XD85AA	1,3
	32GB (1x32GB) DDR4-2666 ECC Reg Memory	Ν	Y	1XD86AA	1,3
	64GB (1x64GB) DDR4-2666 ECC LR Memory	Ν	Y	1XD87AA	1,2,3
	128GB (1x128GB) DDR4-2666 ECC 3DS LR Memory	Ν	Y	3GE82AA	1,2,3
	8GB (1x8GB) DDR4-2933 ECC Reg Memory	Y	Y	5YZ56AA	1,3
	16GB (1x16GB) DDR4-2933 ECC Reg Memory	Ν	Y	5YZ54AA	1,3
	32GB (1x32GB) DDR4-2933 ECC Reg Memory	Ν	Y	5YZ55AA	1,3
	64GB (1x64GB) DDR4-2399 ECC Reg Memory	Ν	Y	5YZ57AA	1,3,4

NOTES:

- 1. For details on the supported memory configurations on the HP Z8 G4 Workstation, please refer to the System Technical Specifications System Board section of this document.
- Sleep (S3 state) support:
 Sleep (S3 state) may not be supported with non-HP validated and qualified 64 GB LR DIMMs.



Supported Components

- Sleep (S3 state) is not supported with 128 GB 3DS LR DIMMs

- 3. You cannot intermix different types of memory. The system will not work if LR DIMMs, RDIMMs or 3DS LR DIMMs are intermixed.
- 4. Available Q2 2019

DIMMs should be equally distributed across all six memory channels for optimal performance.

Each processor supports up to 6 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 a 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.

MT/s = Million Transfers per second

The Z8 G4 is designed to work ONLY with DDR4 memory. The system will not work with DDR3 memory.

Multimedia and Audio Devices

Supported Components

Multimedia and Audio Devices

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	
Integrated Realtek HD ALC221 Audio	Y	Ν			

Optical and Removable Storage

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP SlimTray Optical Drives				
HP 9.5mm Slim Blu Ray Disc Writer	Y	Y	K3R65AA	1
HP 9.5mm Slim DVD ROM	Y	Y	K3R63AA	1
HP Half Height Optical Drives				
HP HH DVD Writer (16X RW DVD-R)	Ν	Y	4AR67AA	
HP 9.5mm Slim DVD Writer*	Y	Y	K3R64AA	1
HP SD Card Reader				
HP SD 4 Card Reader	Y	Y	YOL99AA	
HDD Frame/Carriers				
HP DX175 Removable HDD Carrier	Ν	Y	1ZX72AA	
HP DX175 Removable HDD Frame/Carrier	Ν	Y	1ZX71AA	

NOTE 1: Installing an optical drive into Z8 G4 requires a 5.25" external bay adapter.

*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

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel® I350-T2 PCIe Dual Port Gigabit NIC	Y	Y	V4A91AA	
Intel® I350-T4 PCIe 4-Port Gigabit NIC	Ν	Y	W8X25AA	
Intel [®] Ethernet I210-T1 PCIe x1 Gb NIC	Y	Y	E0X95AA	
Aquantia [®] NBASE-T 5GbE PCIe NIC	Ν	Y	1PM63AA	
Intel [®] X550-T2 10GbE Dual Port NIC	Y	Y	1QL46AA	
Intel® X710-DA2 10GbE SFP+ Dual Port NIC	Y	Y	1QL47AA	1
HP 10GBASE-T Dual NIC Module Z6/8 G4	Y	Y	1QL49AA	
Intel® 8265 802.11 a/b/g/n/ac&BT PCIe	Ν	Y	1QL48AA	



Supported Components

Intel® 9260 802.11 a/b/g/n/ac&BT PCIe	Ν	Υ	6SL33AA
HP 10GbE SFP+ SR 1st Transceiver	Y	Y	C3N53AA
Note 1: Windows 7 is NOT supported			

Racking and Physical Security



Supported Components

Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Security Cable with Kensington Lock	Ν	Y	PC766A	
HP Chassis Intrusion Sensor	Y	Ν		1
HP Z640/Z840/Z8G4 Rail Rack Kit	Ν	Y	2FZ77AA	
HP Z8 Rack Rail Upgrade Kit	Ν	Y	2FZ76AA	
HP Keyed Cable Lock 10mm	Ν	Y	T1A62AA	
NOTE 1: Standard on all systems				

Input Devices

			Option Kit	
	Factory Configured	Option Kit	Part Number	Support Notes
HP Wireless Business Slim Keyboard and Mouse	Y	Y	N3R88AA	
Business Slim PS/2 Wired Keyboard	Y	Y	N3R86AA	
USB Business Slim Wired Keyboard	Y	Y	N3R87AA	
USB Premium Wired Keyboard	Y	Y	Z9N40AA	
USB Wired SmartCard CCID Keyboard	Y	Y	E6D77AA	
3Dconnexion CADMouse	Y	Y	M5C35AA	
HP Optical USB Mouse	Y	Y	QY777AA	
HP PS/2 Mouse	Y	Y	QY775AA	
USB 1000dpi Laser Mouse	Y	Y	QY778AA	
HP USB Hardened Mouse	Y	Y	P1N77AA	

Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Internal USB Port Kit	Ν	Y	EM165AA	Note 1
HP eSATA PCI Cable Kit	Y	Y	GM110AA	Note 2
HP Optical Bay HDD Mounting Bracket	Ν	Y	NQ099AA	Note 3
HP 2.5in HDD/SSD 2-in-1 ODD Bay Bracket	Ν	Y	K4T74AA	Note 4
HP Z Premium Front I/O 2xUSB-A 2xUSB-C	Ν	Y	1XM32AA	
HP Power Cord Kit	Y	Ν		
HP Workstation Mouse Pad	Y	Ν		Japan Only
HP ENERGY STAR [®] Certified Configuration	Y	Ν		

NOTE 1: The HP Internal USB Port kit has a single USB 2.0 type A connector.
NOTE 2: No hot plug / hot swap supported with eSATA
NOTE 3: NQ099AA used to install greater than four 3.5" HDDs in the factory or when purchasing Aftermarket Option (AMO) drives
NOTE 4: K4T74AA used to install greater than four 2.5" HDD/SSDs in the factory or when purchasing Aftermarket Option (AMO) drives



Software		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	Sobey Video Editing SW	Y	Ν		China Only
	SW HP RGS for Z	Y	Ν		
	HP Sure Start Gen3	Y	Ν		
	HP Performance Advisor	Y	Ν		



Supported Components

Operating Systems

HP Z8 G4 Workstation

ms		Support Notes
	Windows 10 Pro 64	
	Windows 7 Professional 64-bit	
	Windows 10 Downgrade to Windows 7	
	HP Linux® Installer Kit	Note 2
	Red Hat [®] Enterprise Linux [®] (RHEL) Workstation – Paper License (1yr)	Note 1
	NOTE 1 : This second OS must be ordered with the HP Linux [®] Installer Kit as the fir	rst OS.
	NOTE 2 : includes drivers for 64-bit OS versions of RHEL 6 & 7, SUSE Linux [®] Enterp Ubuntu 14.04.	orise Desktop 11 and
	For detailed Linux [®] OS/hardware support information, see: http://www.hp.com/support/linux_hardware_matrix	
	For detailed Windows 7 OS hardware support information see http://h10032.www1.hp.com/ctg/Manual/c05857891.pdf. Intel Xeon® SP Processors: Platinum 8100, Gold 6100, Gold 5100, Silver 4100, & E support Microsoft Windows 7 Professional 64-bit.	Bronze 3100 Family

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System Technical Specifications

System Board

•	
System Board Form Factor	Custom Form Factor, 16.34"x15.25" (415mm x 387.2mm)
Processor Socket	Dual FCLGA3647 (Socket P)
CPU Bus Speed	UPI: Up to 10.4GT/second, depending on processor
Chipset	Intel® C622 Chipset
Super I/O Controller	Nuvoton SIO15
Memory Expansion Slots	24 slots (12 slots per CPU)
Memory Type Supported	DDR4 R-DIMM (Registered), ECC: 8GB, 16GB, 32GB, and 64GB (Available Q2 2019) DDR4 LR-DIMM (Load Reduced), ECC: 64GB DDR4 3DS LR DIMM (3D Stacked, Load Reduced), ECC: 128GB
Memory Modes Memory Speed	NUMA (Non-Uniform Memory Architecture), Memory Node Interleave 2133MT/s, 2400MT/s, and 2666MT/s, and 2933MT/s

Supported

Available Memory Configurations:

					Si	ingle P	rocess	Dr					
						CP	U 0						
System			Top	Slots					Bottor	n Slots			Perf
Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7	DIMM 8	DIMM 9	DIMM 10	DIMM 11	DIMM 12	Rating
8GB	8GB												Fair
16GB	8GB											8GB	Good
24GB	8GB		8GB		8GB								Better
2268	8GB		8GB							8GB		8GB	Better
32GB	16GB											16GB	Good
48GB	8GB		8GB		8GB			8GB		8GB		8GB	Best
48GD	16GB		16GB		16GB								Better
64GB	16GB		16GB							16GB		16GB	Better
04UD	32GB											32GB	Good
	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	Best
96GB	16GB		16GB		16GB			16GB		16GB		16GB	Best
	32GB		32GB		32GB								Better
128GB	32GB		32GB							32GB		32GB	Better
192GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	16GB	Best
19200	32GB		32GB		32GB			32GB		32GB		32GB	Best
DECCB	32GB	32GB	32GB		32GB			32GB		32GB	32GB	32GB	Better
256GB	64GB		64GB							64GB		64GB	Better
204CB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	Best
384GB	64GB		64GB		64GB			64GB		64GB		64GB	Best
512GB	64GB	64GB	64GB		64GB			64GB		64GB	64GB	64GB	Better
769 CP	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	Best
768 GB	128GB		128GB		128GB			128GB		128GB		128GB	Best
1.5 TB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	128GB	Best

HP Z8 G4 Workstation

											Dual	Processo	r Configu	ration											
						C	PU O											C	PU 1						
Syste m			Top	Slots					Botto	om Slots					Top	Slots			Bottom Slots				Perf		
Memor	DIMM 1	DIMM 2	DIMM 3		DIMM 5	DIMM 6	DIMM 7	DIMM 8	DIMM 9	DIMM 10	DIMM 11	DIMM 12	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7	DIMM 8	DIMM 9	DIMM 10	DIMM 11	DIMM 12	Ratin a
16GB	8GB	-	,					J		10		12	8GB	-				Ū				10		16	Fair
32GB	8GB											8GB	8GB											8GB	Good
48GB	8GB		8GB		8GB								8GB		8GB		8GB								Bette
4000	8GB		8GB							8GB		8GB	8GB		8GB							8GB		8GB	Bette
64GB	16GB											16GB	16GB											16GB	r
	8GB		8GB		8GB			8GB		8GB		8GB	8GB		8GB		8GB			8GB		8GB		8GB	Good Best
96GB	16GB		16GB		16GB								16GB		16GB		16GB								Bette
	16GB		16GB		1000					16GB		16GB	16GB		16GB		1000					16GB		16GB	r Bette
128GB			TOGD							TOGD					TOGD							TOUD			r
	32GB 8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	32GB 8GB	32GB 8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	32GB 8GB	Good Best
192GB	16GB	OUD	16GB	OUD	16GB	OUD	OUD	16GB	OUD	16GB	OUD	16GB	16GB	OGD	16GB	OGD	16GB	OUD	OGD	16GB	OUD	16GB	OUD	16GB	Best
19266	32GB		32GB		32GB			TOOD		TOOD		TOOD	32GB		32GB		32GB			TOOD		TOOD		1005	Bette
					3200							2267					5200					2267		2265	r Bette
256GB	32GB		32GB							32GB		32GB	32GB		32GB							32GB		32GB	r
	64GB	1000	1000	1000	1000	1000	1000	1000	1000	1000	16GB	64GB	64GB	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	64GB	Good
	16GB 32GB	16GB	16GB 32GB	16GB	16GB 32GB	16GB	16GB	16GB 32GB	16GB	16GB 32GB	TOUB	16GB 32GB	16GB 32GB	16GB	16GB 32GB	16GB	16GB 32GB	16GB	16GB	16GB 32GB	16GB	16GB 32GB	16GB	16GB 32GB	Best
384GB	64GB		64GB		64GB			3200		3200		3200	64GB		64GB		64GB			5206		3200		5200	Best Bette
					0400												0400								r Bette
512GB	64GB		64GB							64GB		64GB	64GB		64GB							64GB		64GB	r
	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	32GB	Best
768GB	64GB		64GB		64GB			64GB		64GB		64GB	64GB		64GB		64GB			64GB		64GB		64GB	Best Bette
	128GB		128GB		128GB								128GB		128GB		128GB								r
1TB	64GB	64GB	64GB		64GB			64GB		64GB	64GB	64GB	64GB	64GB	64GB		64GB			64GB		64GB	64GB	64GB	Bette r
1.5TB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	64GB	Best
	128GB		128GB		128GB			128GB		128GB		128GB	128GB		128GB		128GB			128GB		128GB		128GB	Best

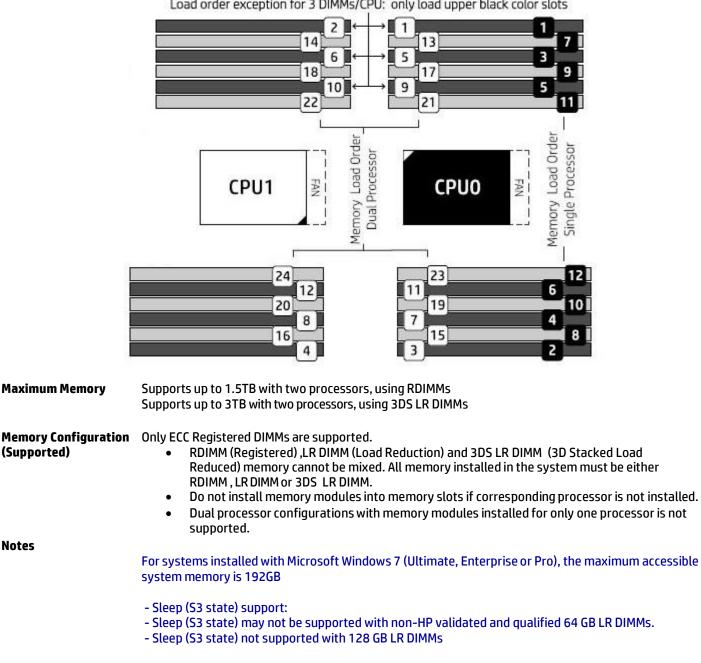
HP Z8 G4 Workstation

зтв	128GB	Best	ł																							
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System Technical Specifications

Memory Loading Order:

Load Order for Single and Dual Processor Configuration



Load order exception for 3 DIMMs/CPU: only load upper black color slots

PCI Express Connectors Two PCIe Gen3 x16 with latch



Notes

	Two PCIe Gen3 x16 with	hlatch
		vith optional 2nd CPU is installed.
	One PCIe Gen3 x8 open	
		ne PCIe Gen2 x4 slot with 1 CPU
	 Enabled for Or Two PCIe Gen3 x4 open 	ne PCIe Gen3 x8 with optional 2nd CPU installed
Supported Drive	SATA	2 sSATA @6Gb/s, supports RAID 0, 1.
Interfaces		8 SATA @6Gb/s, supports RAID 0, 1, 5, 10. Factory integrated Intel® SATA RAID is Microsoft Windows only.
	External SATA	Supported on all SATA and sSATA ports configurable with optional eSATA* After-
	(eSATA)*	Market Option cable kit)
		* hot plug / hot swap not supported with eSATA
	Factory Configured RAID	SATA: RAID 0, 1, 10
Network Controller	Integrated Intel	Memory Integrated 3KB receive buffer and 3KB transmit buffer
	I219LM	Data rates supported: 10/100/1000 Mb/s Compliance IEEE 802.1as/1588, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3i
		802.3u, 802.3x, 802.3z
		Up to 32 programmable filters
		Bus architecture PCIe 1.0 x1 and SMBus
		UEFI and PXE Boot ROM support
		Network transfer rates: 10BASE-T (half-duplex) 10 Mb/s
		10BASE-T (full-duplex) 20 Mb/s
		100BASE-TX (half-duplex) 100 Mb/s
		100BASE-TX (full-duplex) 200 Mb/s
		1000BASE-T (full-duplex) 2000 Mb/s Management capabilities: WOL (All Power States, including Max Power Savings),
		auto MDI crossover, PXE, RSS, Advanced cable diagnostics, AMT 11.2x support,
		vPro compliant
	Integrated Intel X722	
	for 1GbE	Compliance IEEE 802.1as/1588v2, 802.1p, 802.1Q, 802.3, 802.3ab, 802.3az, 802.3x
		Up to 16 UDP/TCP programmable filters
		Bus architecture: PCIe 3.0
		UEFI and PXE Boot ROM support
		Intel iWARP Support (RDMA) Network transfer rates:
		1000BASE-T (full-duplex) 2000 Mb/s
		Management capabilities: WOL (Excluding Max Power Savings), auto MDI
Into evoto d Cuenhice	Nene	crossover, PXE, Quad Hash filtering, RSS, Advanced cable diagnostics
Integrated Graphics PCI-X Connectors	None None	
PCI Card Guide	Yes	
Wake on LAN	Yes, both ports	
Integrated Trusted	•	ıle (TPM) 2.0 (Infineon SLB 9670)
Platform Module	Common Criteria EAL4-	+ Certified
	FIPS 140-2 Certified	15-4.
	TPM Certified products	ust: inggroup.org/membership/certification/tpm-certified-products/
	CG TPM Certified produ	
	http://www.trustedcor	nputinggroup.org/certification/tpm-certified-products/



•				
IEEE 1394 Connector(s)	Front	None		
	Rear	None		
	Internal	None		
USB Connector(s)	Front		1 Gen1 (Left-most Port has Ch	5 5 1 5
			SB 3.1 Gen1, 2x USB 3.1 Gen2	Type-C™ (Left-most Port
		has Charging Capability)		
			provide 1.5 Amps @ 5 Volts	E 17 - 11 -
			ype A Ports provide 900mA @ ts provide 3 Amps @ 5 Volts	5 VOITS
		USB Type C Port	ts provide 3 Arrips @ 5 volts	
	Rear	6 USB 3.1 Gen1, Type A		
		o obb sin denn, rypen		
	Internal	1 USB 3.1 Gen1 available	e with a single 12-pin shroude	d connector.This header
		supports a USB Media Ca		
		1 USB 2.0 single-port he		
		1x USB 2.0 dual-port hea	ader	
HD Integrated Audio	Realtek ALC221			
Flash ROM	Yes			
CPU Fan Header	Two headers for CPU f	ans		
Memory Fan Header	Two headers			
Chassis Fan Header	One Rear Chassis Fan H	leader		
Front PCI Fan Header	One Front and one Aux			
Front User Interface		and HDD Activity LEDs; Pov	ver for USB Ports	
Header	i ower Batton, i ower e			
Front Audio Header	FIO Headset/Mic and S	peaker		
CMOS Battery Holder -	Yes			
Lithium				
Power Supply Headers	Yes			
Clear Password Jumper	Yes			
Serial Port	Yes, on rear panel			
Parallel Port	No			
Keyboard/Mouse	Yes			
Power Supply		5W*/1450W* t, Custom PSU	1450W/1550 90% Efficient,	-
		ng, Active PFC)	(Wide-Ranging	
Operating Voltage		59 VAC	90-26	
Range	50 E		50 20	5 viic
Rated Voltage Range	100-127 VAC	118 VAC	100-127VAC	118 VAC
	200-240 VAC		200-240VAC	
Rated Line	50-60 Hz	400 Hz	50-60Hz	400 Hz
Frequency				
Operating Line	47-66 Hz	393-407 Hz	47-66Hz	393-407 Hz
Frequency Range				
Rated Input Current	12A @ 100-127 VAC 10A @ 200-240 VAC	12A @ 118 VAC	16A @ 100-127 VAC 10A @ 200-240 VAC	16A@ 118VAC
Heat Dissipation	-	2419 btu/hr	TUA @ 200-240 VAC Typical = 2	970 htu/hr
(Configuration and	•••	626 btu/hr	Max 1 = 59	
software dependent)		001 btu/hr	Max 1 = 55 Max 2 = 60	
-		560 btu/hr	Max 3 = 65	



System Technical Specifications

Power Supply Fan ENERGY STAR Qualified (Configuration	(2) Blowers variable speed Yes	(2) Blowers variable speed Yes
dependent) Power Supply Efficiency	90% Efficient	90% Efficient
,	The Z8 G4 1125W (1450W at 200V Input Voltage) power supply efficiency report can be found at this link:	The Z8 G4 1450W (1700W at 200V Input Voltage) power supply efficiency report can be found at this link:
	******	https://plugloadsolutions.com/psu_reports/HP%20Inc _DPS-
	1125BB%20A_1125W_ECOS%204825_Report.pdf	1450AB%20A_1450W_ECOS%204826_Report.pdf
FEMP Standby Power Compliant @115V (<2W in S5 - Power Off)	Yes	Yes
EuP Compliant @ 230V (<0.5 W in S5 - Power Off)	Yes	Yes
CECP Compliant @ 220V (<4W in S3 - Suspend to RAM)	Yes; Configuration dependent	Yes; Configuration dependent
Power Consumption in sleep mode (as defined by ENERGY STAR) - Suspend to RAM (S3) (Instantly Available PC)	TBD	TBD
Built-in Self-Test LED	Yes	Yes
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	Yes	Yes
	*Input volt	age restriction

Input voltage restriction

NOTE: The 1125W (1450W at 200V Input Voltage) power supply can also supply 1275W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1125W. An uninterruptible power supply (UPS) is highly recommended if 1275W output power is desired.

The 1125W Power Supply can also supply 1450W of output power when the input voltage is greater than 180V under all conditions.

NOTE: The 1450W (1700W at 200V Input Voltage) power supply can also supply 1550W of output power when the input voltage is greater than 105V. If the input voltage is less than 105V, but greater than 90V for any reason, the maximum power that can be drawn is 1450W. An uninterruptible power supply (UPS) is highly recommended if 1550W output power is desired.

The 1450W Power Supply can also supply 1700W of output power when the input voltage is greater than



System Technical Specifications

180V under all conditions.

AUX IN (audio) Clear CMOS Button	No Yes
Multibay Header	No
Integrated Gigabit Ethernet	Yes, dual port.
Access Panel Solenoid Lock Header	Νο
Access Panel Intrusion Sensor Header	Yes, as part of Front UI (Control Panel) cable header
Memory Fan Connector	Yes, blind-mate



System Technical Specifications

System Configurations

Example Z8 G4	Processor Info	1x Intel Xeon	3106 1.7 2133	8C 85 1stCPU							
Configuration #1	Memory Info	16GB DDR4-2	2666 (2x8GB) Re	gRAM CPU1							
	Graphics Info	1x NVIDIA Qu	adro P600								
	Disks/Optical/Floppy	1x 256GB SATA 1st SSD /1x DVD-ROM SATA									
	Power Supply	1125W 90% (Custom PSU								
	Other	-									
		115	5 VAC	230	VAC	100	VAC				
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled				
Energy Consumption	Windows Idle (SO)	7	5.4	74	1.8	75	5.7				
	Windows Busy Typ(SO)	12	2.04	11	1.9	113.6					
	Windows Busy Max (SO)	12	25.4	12	4.6	12	6.6				
	Sleep (S3)	6.22	6.26	6.26	6.26	6.33	6.25				
	Off (S5)	4.23	4.19	4.19	4.16	4.13	4.12				
	Zero Power Mode (ErP)	0	.31	0.	40	0.	29				
		115	5 VAC	230	VAC	100	VAC				
Heat Dissipation		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled				
(Btu/hr)	Windows Idle (SO)	25	57.5	25	5.3	25	8.5				
	Windows Busy Typ(SO)	41	16.4	38	2.0	38	7.6				
	Windows Busy Max (SO)	42	27.9	42	5.1	43	2.0				
	Sleep (S3)	21.2	21.1	21.3	21.2	21.6	21.3				
	Off (S5)	14.4	14.0	14.3	14.2	14.1	14.1				
	Zero Power Mode (ErP)	1	.04	1.	38	0.99					

Example Z8 G4	Processor Info	2x Intel Xeon	4114 2.2 2400	10C 85 1stCP	U							
Configuration #2	Memory Info	48GB DDR4-2	666 (6x8GB) R	egRAM CPU2								
	Graphics Info	1x NVIDIA Qu	adro P2000									
	Disks/Optical/Floppy	4x 512GB SA1	A 1st SSD /1x l	DVD-ROM SAT	A							
	Power Supply	1125W 90% 0	125W 90% Custom PSU									
	Other	-										
		115	5 VAC	230	VAC	100	VAC					
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled					
Energy Consumption	Windows Idle (SO)	1()5.2	10	3.3	102.5						
	Windows Busy Typ(SO)	25	57.4	24	6.3	26	0.9					
	Windows Busy Max (S0)	29	96.2	28	9.9	29	7.6					
	Sleep (S3)	8.46	8.35	8.57	8.45	8.58	8.57					
	Off (S5)	4.15	4.14	4.31	4.19	4.21	4.15					
	Zero Power Mode (ErP)	0	.31	0.	40	0.	29					
		115	5 VAC	230	VAC	100	VAC					
Heat Dissipation		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled					
(Btu/hr)	Windows Idle (SO)	35	59.0	35	2.5	34	9.8					
	Windows Busy Typ(SO)	87	78.3	84	0.5	890.2						



Windows Busy Max (SO)	10	10.7	98	9.1	10'	15.6
Sleep (S3)	28.8	28.5	29.2	28.8	29.2	29.2
Off (S5)	14.1	14.1	14.6	14.2	14.3	14.1
Zero Power Mode (ErP)	1	.04	1.	36	0.	99

Example Z8 G4	Processor Info	2x Intel Xeon	5120 2.2 2400	14C 105 1stC	PU			
Configuration #3	Memory Info	96GB DDR4-2	666 (12x8GB) I	RegRAM CPU2				
	Graphics Info	1x NVIDIA Quadro P4000						
	Disks/Optical/Floppy	4x 2TB 7200	RPM SATA 1st H	IDD /1x DVDR	W SATA			
	Power Supply	1125W 90% (Custom PSU					
·	Other	-						
		115	5 VAC	230	VAC	100	VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	
Energy Consumption	Windows Idle (SO)	125.7		12	3.6	125.8		
	Windows Busy Typ(SO)	34	10.7	33	2.9	343.7		
	Windows Busy Max (SO)	417.1		411.8		426.1		
	Sleep (S3)	9.28	9.10	9.24	9.15	9.49	9.26	
	Off (S5)	4.15	4.14	4.32	4.10	4.21	4.16	
	Zero Power Mode (ErP)	0	.31	0.	41	0.	30	
		115	5 VAC	230	VAC	100	VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled	
Heat Dissipation	Windows Idle (SO)	42	29.3	42	2.0	42	9.5	
(Btu/hr)	Windows Busy Typ(SO)	11	62.7	1136.0		1172.9		
	Windows Busy Max (SO)	14	23.4	140)5.3	1453.9		
	Sleep (S3)	31.6	31.0	31.5	31.2	32.4	31.5	
	Off (S5)	14.1	14.1	14.7	13.9	14.3	14.2	
	Zero Power Mode (ErP)	1	.05	1.	38	1.	03	

Example Z8 G4	Processor Info	2x Intel Xeon	6152 2.1 2666	5 22C 140 CPU			
Configuration #4	Memory Info	192GB DDR4-2666 (24x8GB) RegRAM CPU					
	Graphics Info	2x NVIDIA Qua	dro P5000				
	Disks/Optical/Floppy	6x 1 TB SATA	SSD /1x DVD	RW SATA			
	Power Supply	1125W 90% C	ustom PSU				
	Other	-	-				
		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled
Energy Consumption	Windows Idle (SO)	161.1		157.8		160.4	
	Windows Busy Typ(SO)	524.7		500.7		496.1	
	Windows Busy Max (SO)	644	1.2	624	4.2	65	2.7
	Sleep (S3)	10.3	10.2	10.2	10.1	10.1	10.1
	Off (S5)	4.14	4.01	4.19	4.19	4.16	4.15
	Zero Power Mode (ErP)	0.3	31	0.41		0.31	



System Technical Specifications

		115 VAC		230 VAC		100 VAC		
Heat Dissipation		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled	
(Btu/hr)	Windows Idle (SO)	549.6		538.4		547.5		
	Windows Busy Typ(SO)	1790.4		170	708.6		1692.6	
	Windows Busy Max (SO)	2198.1		2129.8		2227.0		
	Sleep (S3)	35.3	34.9	35.0	34.7	34.5	134.3	
	Off (S5)	14.1	13.6	14.3	14.3	14.2	14.1	
	Zero Power Mode (ErP)	1.(06	1.	39	1.0	04	

Example Z8 G4	Processor Info	2x Intel Xeon	6136 3.0 266	5 12C 150 CPU				
Configuration #5	Memory Info	768GB DDR4-	2666 (24x320	6B) RegRAM CF	2U2			
	Graphics Info	2x NVIDIA Quadro P6000						
	Disks/Optical/Floppy	HP Z Turbo Q	uad Pro 4x1TE	3 + 4x 1 TB SA ⁻	TA SSD /1x D	/DRW SATA		
	Power Supply	1450W 90% C	ustom PSU					
	Other	-						
		115	VAC	230	VAC	100	VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	
Energy Consumption	Windows Idle (SO)	194.0		19	2.6	197.0		
	Windows Busy Typ(SO)	640.2		622.0		647.0		
	Windows Busy Max (SO)	788.0		761.3		800.6		
	Sleep (S3)	21.1	19.7	19.7	18.8	21.3	19.8	
	Off (S5)	4.24	4.22	4.53	4.51	4.24	4.21	
		115	VAC	230	VAC	100	VAC	
Heat Dissipation		LAN Enabled	LAN Disabled	LAN Enabled	LAN Enabled	LAN Disabled	LAN Enabled	
(Btu/hr)	Windows Idle (SO)	667	2.1	657.2		672.3		
	Windows Busy Typ(SO)	218	4.3	2122.3		2207.7		
	Windows Busy Max (SO)	268	8.8	259	97.8	2731.7		
	Sleep (S3)	72.3	67.5	67.5	64.1	72.6	67.7	
	Off (S5)	14.4	14.4	15.4	15.4	14.4	14.3	

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

System Configuration (Entry level)	Processor Info	2-Intel [®] Xeon [®] Gold 6134 processor 3.2GHz 8C CPU
	Memory Info	96GB (12x8GB) DDR4-2666 ECC Memory RDIMMs
	Graphics Info	1-NVIDIA [®] Quadro [®] P400 2GB
	Disks/Optical	1-500GB SATA 7200RPM 3.5" HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer
	Power Supply	1125 W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.6	19



System Technical Specifications

Hard drive Operating (random reads)	3.7	19
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System Configuration (Mid-range)	Processor Info	2-Intel [®] Xeon [®] Gold 6146 processor 3.2GHz 12C CPU
	Memory Info	384GB (24x16GB) DDR4-2666 ECC Memory RDIMMs
	Graphics Info	1-NVIDIA® Quadro® P6000 24GB
	Disks/Optical	2-300GB 12Gb/s 15KRPM SAS HDD / 1-HP 9.5mm Slim Blu Ray Disc Writer
	Power Supply	1450 W

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.6	20
	Hard drive Operating (random reads)	3.8	23

ENVIRONMENTAL DATA

Environmental Requirements	Temperature	Operating: 5° to 35° C (40° to 95° F) Non-operating: -40° to 60° C (-40° to 140° F)
	Humidity	Operating: 8% to 85% RH, non-condensing Non-operating: 8% to 90% RH, non-condensing
	Maximum Altitude	Operating: 3,048 m (10,000 feet) Non-operating: 9,144 m (30,000 feet)
	Dynamic (new)	Shock Operating: ½-sine: 40g, 2-3ms (~62 cm/sec) Non-operating: ½-sine: 160 cm/s, 2-3ms (~105g) square: 422 cm/s, 20g NOTE: Values represent individual shock events and do not indicate repetitive shock events.
		Vibration Operating random: 0.5g (rms), 5-300 Hz, up to 0.0025g²/Hz Non-operating random: 2.0g (rms), 5-500 Hz, up to 0.0150 g²/Hz NOTE: Values do not indicate continuous vibration.
	Cooling	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, up to 3048 m (10,000 feet)

Physical Security and Serviceability

Access Panel	Tool-less Includes system board and memory information.
Optical Drive	Tool-less, 2 nd Optical Drive requires a 5.25" bay carrier
Hard Drives	Tool-less
Expansion Cards	Tool-less
Processor Socket	Tool-less



Blue User Touch Points	Yes, on tool-free internal chassis components.
Color-coordinated Cables	Yes
and Connectors Memory	Tool-less
System Board	Tool-less, retained by Front Card Guide and Top Memory Fan Holder
Dual Color Power and HD	
LED on Front of Computer	
Configuration Record SW Over-Temp Warning on	Yes. Temp-Caution and Temp Critical are provide via the WMI interface. Tools like the HPPA can display
Screen	the Critical and Caution state.
Restore CD/DVD Set	Restores the computer to its original factory shipping image; can be obtained via HP Support.
Dual Function Front Power Switch	Yes, causes a fail-safe power off when held for 4 seconds
Power Switch Padlock Support	Νο
Cable Lock Support	Yes, Kensington Cable Lock (optional): Prevents entire system theft only. 3mm x 7mm slot at rear of
	system
Universal Chassis Clamp	No
Lock Support Solenoid Lock and Hood	Νο
Sensor	
Rear Port Control Cover	No
Serial, USB, Audio, Network,	Yes. USB disablement zones are Front, Rear and Internal
Enable/Disable Port	
Control	
Removable Media	No
Write/Boot Control Power-On Password	Yes, prevents an unauthorized person from booting up the workstation
Setup Password	Yes, prevents an unauthorized person from changing the workstation configuration
3.3V Aux Power LED on	No
System PCA	···
NIC LEDs (integrated) (Green & Amber)	Yes
CPUs and Heatsinks	A torx driver (T30) is needed to remove the heatsink(s). CPU attached to heatsink via tool-less clip
Power Supply Diagnostic	Yes
LED	
Front Power Button Front Power LED	Yes Yes, white (normal), red (fault)
Front Hard Drive Activity	Yes, white
LED Exant ODD Activity LED	Vac
Front ODD Activity LED	Yes
Internal Speaker	Yes
System/Emergency ROM Flash Recovery	Recovers corrupted system BIOS
Cooling Solutions	Air cooled forced convection
Power Supply Fans	2x – Dual Side Inlet Blowers
CPU Heatsink Fan	80mm x 25mm 5-wire PWM for each CPU
Chassis Fan	Rear: 120mm x 38mm
	Front: 120mm x 25mm (PCIe zone)



Memory Heatsink Fan	Front 92mm x 25mm (upper memory bank); Front 80mm x 25mm (lower memory bank)
HP PC Hardware Diagnostics UEFI	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.
Access Panel Key Lock	Yes, prevents removal of the access panel and all internal components including optical and storage devices
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI).
	 Allows the system to wake from a low-power mode. 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
Trusted Platform Module Chip	Yes
Integrated Chassis Handles	Yes, front and rear
Power Supply	Tool-less, rear access direct-connect (blind-mate)
PCIe Card Retention	Yes, tool-less
	Rear (all) Middle (full-height cards)
	Front (full-length cards with extenders)
Flash ROM	Yes.SPI ROM
Diagnostic Power Switch LED on board	Yes
Clear Password Jumper	Yes
Clear CMOS Button	Yes
CMOS Battery Holder	Yes
DIMM Connectors	Yes
BIOS	
BIOS 32-bit Services	Standard BIOS 32-bit Service Directory Proposal v0.4 BIOS supports 32 and 64-bit Operating systems.
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces.
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0.
BBS	BIOS Boot Specification v1.01.
WMI Support	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.
BIOS Boot Spec 1.01+	Provides more control over how and from what devices the workstation will boot.
BIOS Power On	Users can define a specific date and time for the system to power on.
ROM Based Computer	Review and customize system configuration settings controlled by the BIOS.
Setup Utility (F10)	Personana sustain BIOC in community of Flack BOM
System/Emergency ROM Flash Recovery with Video	Recovers system BIOS in corrupted Flash ROM.
Replicated Setup	Saves BIOS settings to USB flash device in human readable file (HpSetup.txt). BiosConfigurationUtility.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
SMBIOS	System Management BIOS 2.8, for system management information.



Boot Control	Disables the ability to boot from removable media on supported devices.
Memory Change Alert	Alerts management console if memory is removed or changed.
Thermal Alert	Monitors the temperature state within the chassis. Three modes: • NORMAL - normal temperature ranges.
	• ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown.
	• SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console.
ACPI (Advanced	Allows the system to enter and resume from low power modes (sleep states).
Configuration and Power Management Interface)	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.
	Supports ACPI 5.0 for full compatibility with 64-bit operating systems.
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
Remote Wakeup/Remote Shutdown	System administrators can power on, restart, and power off a client computer from a remote location.
Instantly Available PC (Suspend to RAM - ACPI sleep state S3)	Allows for very low power consumption with quick resume time.
Remote System Installation via F12 (PXE 2.1) (Remote Boot from	Allows a new or existing system to boot over the network and download software, including the operating system.
Server)	
ROM revision levels	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.
System board revision	Allows management SW to read revision level of the system board.
level	Revision level is digitally encoded into the HW and cannot be modified.
Start-up Diagnostics (Power-on Self-Test)	Assesses system health at boot time with selectable levels of testing.
Auto Setup when new hardware installed	System automatically detects addition of new hardware.
Keyboard-less Operation	The system can be booted without a keyboard.
Localized ROM Setup	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 14 languages with local keyboard mappings.
Asset Tag	The user or MIS to set a unique tag string in non-volatile memory.
Per-slot Control	Allows I/O slot parameters (option ROM enable/disable, bus latency) to be configured individually.
Adaptive Cooling	Control parameters are set according to detected hardware configuration for optimal acoustics.
Pre-boot Diagnostics	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
Industry Standard Specification Support	
Industry Standard	Revision Supported by the BIOS
UEFI Specification Revision	2.5
ACPI	Advanced Configuration and Power Management Interface, Version 5.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6), Revision 3b
CD Boot	"El Torito" Bootable CD-ROM Format Specification Version 1.0
EDD	- Enhanced Disk Drive Specification Version 1.1 - BIOS Enhanced Disk Drive Specification Version 3.0
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision 1.0
PCI	PCI Local Bus Specification, Revision 2.3



System Technical Specifications

	PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0, Draft .7
PCI Express	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0
РММ	POST Memory Manager Specification, Version 1.01
SATA	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
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
ТРМ	Trusted Computing Group TPM Specification Version 2.0 (Infineon SLB 9670). Common Criteria EAL4+ certified. FIPS 140-2 Certification TCG TPM Certified products list: http://www.trustedcomputinggroup.org/certification/tpm-certified-products/
UHCI	Universal Host Controller Interface Design Guide, Revision 1.1
USB	Universal Serial Bus Revision 1.1 Specification
	Universal Serial Bus Revision 2.0 Specification
SMBIOS	Universal Serial Bus Revision 3.1 Specification System Management BIOS Reference Specification, Version 2.8
	External BIOS simulator found at: http://h20464.www2.hp.com/index.html

Social and Environmental Responsibility

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Eco-Label Certifications & 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 Z8 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 3rd party
option store for solar generator accessories at http://www.hp.com/go/optionsBatteriesThe battery in this product complies with EU Directive 2006/66/EC
Battery size: CR2032 (coin cell)
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



System Technical Specifications

Low Halogen Statement End-of-Life Management	This product is low-halogen except for power cords, external cables and peripherals. The following customer-configurable internal components may not be low-halogen: 3 ½" SAS HDDs. Service parts obtained after purchase may not be low-halogen. HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To
and Recycling	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.
HP Inc. Corporate Environmental Information	For more information about HP's commitment to the environment: Sustainability Report
	Eco-label certifications: http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
Additional Information	ISO 14001 certificate: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html 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	• This product is >90% recycle-able when properly disposed of at end of life. 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 External	Cushions and plastic bags made of low density polyethylene (LDPE). Outer carton, accessories carton, and insert made of corrugated paper board.
Manageability Industry Standard Specifications	This product meets the following industry standard specifications for manageability functionality:
••••	• DASH 1.1 (via Intel [®] LAN on motherboard)
Intel® Active Managemen Technology (AMT)	tIntel® Active Management Technology (AMT) 11.2x
	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 11.2x 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)



QuickSpecs

System Technical Specifications

•	Hardware Inventory	(includes B	IOS and firmware	revisions)
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- Hardware Alerting
- Agent Presence
- System Defense Filters
- 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 Z8 G4 Workstation supports Intel® vPro™ technology when configured as outlined below:

- Intel[®] Xeon[®] processor E5-1600 v5 or E5-2600 v5 product family featuring Intel[®] vPro[™] Technology
- Intel[®] C622 chipset
- Intel[®] I219LM GbE LAN

Remote Manageability Software Solutions	The HP Z8 G4 Workstation is supported on the following remote manageability software consoles:
	 LANDesk Management Suite (HP recommended solution) Microsoft System Center Configuration Manager HP Client Automation Enterprise
System Software	For questions or support for manageability needs, please visit http://www.hp.com/go/clientmanagement For questions or support for SSM, please visit: http://www.hp.com/go/ssm
Manager 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 are extended service contracts that go beyond the standard limited warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product,



System Technical Specifications

use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Additional HP Care Pack Services information by product is available at: http://www.hp.com/hps/carepack. Service levels and response times for HP Care Packs may vary depending on your geographic location. HP services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

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

Global Series SKUs	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 and software 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.			
Stable & Consistent Offerings	HP Stable & Consistent Offerings are available worldwide to all HP Workstation customers-no special programs, no additional cost-no kidding. Simply select your hardware and software 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		
	2DL76AV	Intel [®] Xeon [®] Gold 6128 processor		
	2DL77AV / 1XM69AA	Intel [®] Xeon [®] Gold 6128 2 nd processor		
	2DL66AV	Intel [®] Xeon [®] Silver 4114 processor		
	2DL67AV / 1XM74AA	Intel [®] Xeon [®] Silver 4114 2 nd processor		
	2DL62AV	Intel [®] Xeon [®] Silver 4108 processor		
	2DL63AV / 1XM76AA	Intel [®] Xeon [®] Silver 4108 2 nd processor		
Hard Drives	Product #	Offering		
	Z5J60AV / LQ037AA	1TB SATA 7200 RPM 3.5" HDD		
Graphics	Product #	Offering		
	2TF08AA	AMD Radeon™ Pro WX 3100 4GB Graphics		
Memory	Product #	Offering		
	TBD	TBD		
Optical and Removable	Product #	Offering		
Storage	TBD	TBD		



Technical Specifications - Processors

Intel® Xeon® Platinum 8280 processor Intel[®] Xeon[®] Platinum 8260M processor Intel® Xeon® Platinum 8260 processor Intel[®] Xeon[®] Platinum 8180 processor Intel[®] Xeon[®] Platinum 8160M processor Intel[®] Xeon[®] Platinum 8160 processor Intel[®] Xeon[®] Gold 6254 processor Intel[®] Xeon[®] Gold 6252 processor Intel[®] Xeon[®] Gold 6248 processor Intel[®] Xeon[®] Gold 6244 processor Intel[®] Xeon[®] Gold 6242 processor Intel[®] Xeon[®] Gold 6240Y processor Intel[®] Xeon[®] Gold 6240 processor Intel[®] Xeon[®] Gold 6230 processor Intel[®] Xeon[®] Gold 6152 processor Intel[®] Xeon[®] Gold 6154 processor Intel[®] Xeon[®] Gold 6148 processor Intel[®] Xeon[®] Gold 6146 processor Intel[®] Xeon[®] Gold 6144 processor Intel[®] Xeon[®] Gold 6142M processor Intel[®] Xeon[®] Gold 6142 processor Intel[®] Xeon[®] Gold 6140M processor Intel[®] Xeon[®] Gold 6140 processor Intel[®] Xeon[®] Gold 6138 processor Intel[®] Xeon[®] Gold 6136 processor Intel[®] Xeon[®] Gold 6134M processor Intel[®] Xeon[®] Gold 6134 processor Intel[®] Xeon[®] Gold 6132 processor Intel[®] Xeon[®] Gold 6130 processor Intel[®] Xeon[®] Gold 6128 processor Intel[®] Xeon[®] Gold 6126 processor* Intel[®] Xeon[®] Gold 5222 processor Intel[®] Xeon[®] Gold 5220 processor Intel[®] Xeon[®] Gold 5218 processor Intel[®] Xeon[®] Gold 5215M processor Intel[®] Xeon[®] Gold 5215 processor Intel[®] Xeon[®] Gold 5120 processor Intel[®] Xeon[®] Gold 5118 processor Intel[®] Xeon[®] Gold 5122 processor Intel[®] Xeon[®] Gold 4216 processor Intel[®] Xeon[®] Gold 4215 processor Intel[®] Xeon[®] Gold 4214Y processor Intel[®] Xeon[®] Gold 4214 processor Intel[®] Xeon[®] Gold 4210 processor



QuickSpecs

Technical Specifications - Processors

Intel® Xeon® Gold 4208 processor Intel® Xeon® Silver 4116 processor Intel® Xeon® Silver 4114 processor Intel® Xeon® Silver 4112 processor Intel® Xeon® Silver 4110 processor Intel® Xeon® Silver 4108 processor Intel® Xeon® Gold 3204 processor Intel® Xeon® Bronze 3106 processor Intel® Xeon® Bronze 3104 processor *Intel® Xeon® Gold 6126 processor (selected North America public sector customers only), Availability date TBD. **Available May 2019



STORAGE/HARD DRIVES

HP SAS (Serial Attached SCSI) Hard Drives for HP	HP 300GB SAS 15K SFF HDD	Capacity	300GB	
		Height	5.9 in; 15 cm	
Workstations		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)



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



	• ·	4.70		
1TB SATA 7200 rpm 6Gb/s 3.5" HDD (Enterprise Class)	Capacity	1TB		
	Protocol	SATA		
(Enterprise Class)	Form Factor	3.5"		
	Controller	AHCI		
	Reliability (MTBF)	2.0M hours		
	Rated Power On Hours	8760/yr		
	Annualized Failure Rate (based on Rated POH)	<0.62%		
	Rated for 24/7/365 operation	YES		
	Physical Size (Height)	1 in; 2.54 cm		
	Physical Size (Width)	4 in; 10.17 cm		
	Media Diameter	3.5 in; 8.9 cm		
	Interface	Serial ATA (6Gb/s), NCQ	enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s		
	Buffer	128MB		
	Seek Time (typical reads,	Single Track	0.32ms	
	includes controller	Average	7.45ms	
	overhead, including settling)	Full Stroke	14.2ms	
	Operating Temperature	41° to 140° F (5° to 60° (<u>[</u>)	
	Performance	Sequential Read	up to 226MB/s	
		Sequential Write	up to 226MB/s	
	Enterprise Class Features	High Reliability		

4TB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity Height	4TB 0.275 in; 0.7 cm		
(Enterprise Class)	Width	Media Diameter	2.5 in; 6.36 cm	
		Physical Size	2.75 in; 6.99 cm	
	Interface	Serial ATA (6Gb/s), NCQ enabled		
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s		
	Buffer	128MB		
	Seek Time (typical reads,	Single Track	0.7ms	
	includes controller	Average	8.5ms	
	overhead, including settling)	Full Stroke	15.7ms	
	Rotational Speed	7,200 rpm		
	Operating Temperature	32° to 140° F (0° to 60°	C)	
500GB SATA 7.2K SED	Capacity	500GB		
SFF HDD	Height	0.275 in; 0.7 cm		
	Width	Media Diameter	2.5 in; 6.36 cm	
		Physical Size	2.75 in; 6.99 cm	
	Interface	Serial ATA (6Gb/s)		
	Synchronous Transfer	Up to 600MB/s		

	Filysical Size	2.75 m, 0.99 cm
Interface	Serial ATA (6Gb/s)	
Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
Buffer	32MB	
Seek Time (typical reads,	Single Track	1ms
includes controller overhead, including settling)	Average	4.2ms
	Full Stroke	25ms (typical)
Rotational Speed	7,200 rpm	
Operating Temperature	32° to 140° F (0° to 60° (()



SATA SSDs for HP	HP 256GB SATA 6Gb/s	Capacity	256GB	
Workstations	SSD	Capacity Protocol	SATA	
		Form Factor	2.5"	
		Controller	AHCI	
		NAND Type Endurance	3D TLC	
			192TBW (TB Written) 1.5M hours	
		Reliability (MTTF)	0.28 in; 0.7 cm	
		Physical Size (Height) Physical Size (Width)		
		Interface	2.5 in; 6.36 cm SATA 6Gb/s	
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
		Operating Temperature	32° to 158° F (0° to 70°	° C)
		Performance	Sequential Read	530MB/s (max)
			Sequential Write	500MB/s (max)
			Random Read	55K IOPS (max)
			Random Write	83K IOPS (max)
	HP 256GB SATA 6Gb/s	Capacity	256GB	
	SED Opal 2 SSD	Protocol	SATA	
		Form Factor	2.5"	
		Controller	AHCI	
		NAND Type	3D TLC	
		Endurance	192TBW (TB Written)	
		Reliability (MTTF)	1.5M hours	
		Physical Size (Height)	0.28 in; 0.7 cm	
		Physical Size (Width)	2.5 in; 6.36 cm	
		Interface	6Gb/s SATA	
		Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Seque	ntial Read)
		Operating Temperature	32° to 158° F (0° to 70°	° C)
		Performance	Sequential Read	530MB/s
			Sequential Write	500 MB/s
			Random Read	55K IOPS
			Random Write	83K IOPS
		Self-Encrypting Drive Support	OPAL 2	
	HP 512GB SATA 6Gb/s	Capacity	512GB	
	SSD	Protocol	SATA	
		Form Factor	2.5"	
		Controller	AHCI	
		NAND Type	3D TLC	
		Endurance	388TBW (TB Written)	
		Reliability (MTTF)	1.5M hours	
		Physical Size (Height)	0.28 in; 0.7 cm	
			0.20, 0.7	



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



HP 2TB SATA 6Gb/s SSD	Capacity	2TB	
	Protocol	SATA	
	Form Factor	2.5"	
	Controller	AHCI	
	NAND Type	3D TLC	
	Endurance	400TBW (TB Written)	
	Reliability (MTTF)	1.5M hours	
	Physical Size (Height)	0.28 in; 0.7 cm	
	Physical Size (Width)	2.5 in; 6.36 cm	
	Interface	SATA 6Gb/s	
	Synchronous Transfer Rate (Maximum)	Up to 550MB/s (Sequent	tial Read)
	Operating Temperature	32° to 158° F (0° to 70° ([)
	Performance	Sequential Read	530 MB/s
		Sequential Write	500 MB/s
		Random Read	95K IOPS
		Random Write	83K IOPS
HP Enterprise Class	Capacity	240GB	
240GB SATA SSD	Protocol	SATA	
	Form Factor	2.5"	
	Controller	AHCI	
	NAND Type	3D TLC	
	Endurance	2,200TBW (TB Written)	
	Reliability (MTTF)	2.0M hours	
	Physical Size (Height)	0.28 in; 0.7 cm	
	Physical Size (Width)	2.5 in; 6.36 cm	
	Interface	6Gb/s SATA	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Operating Temperature	32° to 158° F (0° to 70° (
	Performance	Sequential Read	540 MB/s
		Sequential Write	310 MB/s
		Random Read	93K IOPS
		Random Write	48K IOPS
	Enterprise Class Features	High Endurance NAND Power Loss Protection End-to-End Data Protec	tion
HP Enterprise Class	Capacity	480GB	
480GB SATA SSD	Protocol	SATA	
	Form Factor	2.5"	
	Controller	AHCI	
	NAND Type	3D TLC	
	Endurance	4,400TBW (TB Written)	
	Reliability (MTTF)	2.0M hours	
	Physical Size (Height)	0.28 in; 0.7 cm	
 	רוואסונמו סוצפ (הפוטוונ)	0.20 11, 0.7 (11)	



		Physical Size (Width)	2.5 in; 6.36 cm	
		Interface	6Gb/s SATA	
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
		Operating Temperature	32° to 158° F (0° to 70°	C)
		Performance	Sequential Read	540 MB/s
			Sequential Write	460 MB/s
			Random Read	93K IOPS
			Random Write	74K IOPS
		Enterprise Class Features	High Endurance NAND Power Loss Protection End-to-End Data Protect	ction
PCIe SSDs for HP	HP Z Turbo Drive G2	Capacity	256GB	
Workstations	256GB SSD	Protocol	PCle	
		Form Factor	M.2	
		Controller	NVMe	
		NAND Type	MLC	
		Endurance	150TB	
		Reliability (MTBF)	1.5M hours	
		Interface	PCI Express 3.0 x4 elect	rical x4 physical
		Operating Temperature	32° to 158° F (0° to 70°	
		Performance	Sequential Read	2800 MB/s
			Sequential Write	1100 MB/s
			Random Read	250K 10PS
			Random Write	180K IOPS
	HP Z Turbo Drive G2	Capacity	512GB	
512GB	512GB SSD	Protocol	PCle	
		Form Factor	M.2	
		Controller	NVMe	
		NAND Type	3D MLC	
		Endurance	300TB	
		Reliability (MTBF)	1.5M hours	
		Interface	PCI Express 3.0 x4 elect	rical x4 physical
		Operating Temperature	32° to 158° F (0° to 70°	C)
		Performance	Sequential Read	2800 MB/s
			Sequential Write	1600 MB/s
			Random Read	260K IOPS
			Random Write	260K IOPS
	HP Z Turbo Drive G2 1TB	Capacity	1TB	
	SSD	Protocol	PCIe	
		Form Factor	M.2	
		Controller	NVMe	

330K IOPS

Technical Specifications - Hard Drives

NAND Type	3D MLC	
Endurance	600TB	
Reliability (MTTF)	1.5M hours	
Interface	PCI Express 3.0 x4 ele	ectrical x4 physical
Operating Temperature	32° to 158° F (0° to 70° C)	
Performance	Sequential Read	3000 MB/s
	Sequential Write	1700 MB/s
	Random Read	360K IOPS

Random Write



HP Z Turbo Drive Quad Pro 2x256GB PCIe SSD	Capacity Protocol Form Factor Controller NAND Type Endurance Reliability (MTBF) Interface Operating Temperature Performance	512GB PCIe PCIe Card, Full Height I NVMe MLC 150TB 1.5M hours PCIe Gen3 x4 architect 32° to 158° F (0° to 70 Sequential Read Sequential Write Random Read Random Write	ure
HP Z Turbo Drive Quad Pro 2x512GB PCIe SSD	Capacity Protocol Form Factor Controller NAND Type Endurance Reliability (MTBF) Interface Operating Temperature Performance	1TB PCIe PCIe Card, Full Height I NVMe 3D MLC 300TB 1.5M hours PCIe Gen3 x4 architect 32° to 158° F (0° to 70 Sequential Read Sequential Write Random Read Random Write	ure
HP Z Turbo Drive Quad Pro 2x1TB PCIe SSD HP Z Turbo Drive G2	Capacity Protocol Form Factor Controller NAND Type Endurance Interface Operating Temperature Performance	2TB PCIe PCIe Card, Full Height I NVMe 3D MLC 600TB PCI Express 3.0 x4 elec 32° to 158° F (0° to 70 Sequential Read Sequential Write Random Read Random Write	ctrical x4 physical
256GB SED SSD	Protocol	PCIe	



	Form Factor	M.2	
	Controller	NVMe	
		MLC	
	NAND Type Endurance		
		150TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elec	
	Operating Temperature	32° to 158° F (0° to 70°	
	Performance	Sequential Read	2800 MB/s
		Sequential Write	1100 MB/s
		Random Read	250K IOPS
		Random Write	180K IOPS
	Self-Encrypting Drive Support	OPAL 2	
HP Z Turbo Drive G2	Capacity	512GB	
512GB SED SSD	Protocol	PCle	
	Form Factor	M.2	
	Controller	NVMe	
	NAND Type	MLC	
	Endurance	300TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elec	trical x4 physical
	Operating Temperature	32° to 158° F (0° to 70°	C)
	Performance	Sequential Read	2800 MB/s
		Sequential Write	1600 MB/s
		Random Read	260K IOPS
		Random Write	260K IOPS
	Self-Encrypting Drive Support	OPAL 2	
HP Z Turbo Drive G2	Capacity	256GB	
256GB TLC SSD	Protocol	PCle	
	Form Factor	M.2	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	75TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elec	trical x4 physical
	Operating Temperature	32° to 158° F (0° to 70°	C)
	Performance	Sequential Read	3000 MB/s
		Sequential Write	320 MB/s (1300 MB/s max/Turbo)
		Random Read	130K IOPS
		Random Write	310K IOPS
	Capacity	512GB	
	capacity	51200	



QuickSpecs

HP Z Turbo Drive G2	Protocol	PCle	
512GB TLC SSD	Form Factor	M.2	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	150TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elect	rical v4 physical
	Operating Temperature	32° to 158° F (0° to 70°)	
	Performance	Sequential Read	3000 MB/s
	renomance	Sequential Write	660 MB/s (1800 MB/s max/Turbo)
		Random Read	270K 10PS
		Random Write	420K 10PS
HP Z Turbo Drive G2 1TB	Capacity	1TB	
TLC SSD	Protocol	PCIe	
	Form Factor	M.2	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	300TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elect	rical v4 physical
	Operating Temperature	32° to 158° F (0° to 70°	
	Performance	Sequential Read	3200 MB/s
	Perrormance	-	1150 MB/s (2400 MB/s
		Sequential Write	max/Turbo)
		Random Read	380K IOPS
		Random Write	440K IOPS
HP Z Turbo Drive G2 2TB	Capacity	2TB	
TLC SSD	Protocol	PCIe	
	Form Factor	M.2	
	Controller	NVMe	
	NAND Type	3D TLC	
	Endurance	600TBW (TB Written)	
	Reliability (MTBF)	1.5M hours	
	Interface	PCI Express 3.0 x4 elect	rical x4 physical
	Operating Temperature	32° to 158° F (0° to 70°	C)
	Performance	Sequential Read	3200 MB/s
		Sequential Write	1150 MB/s (2400 MB/s max/Turbo)
		Random Read	340K IOPS
		Random Write	440K IOPS
HP Z Turbo Drive Quad Pro 256GB SSD module	Capacity	256GB (one M.2 PCIe NV	'Me module)
	Interface	PCI Express 3.0 x4 elect	rical x4 physical

		Form Factor	PCIe Card, Half Height
Intel® 905p Series AIC PCIe SSD	Intel® 905p Series AIC 280GB PCIe SSD	Capacity Protocol	280GB PCle
Operating Temperature	32° to 158° F (0°	to 70° C)	
		4 electrical x4 physical	
Capacity:	2TB (one M.2 PCI		
HP Z Turbo Drive Dual Pr	o 2TB SSD		
Operating Temperature	32° to 158° F (0°	to /0° L)	
Interface	-	4 electrical x4 physical	
Capacity:	1TB (one M.2 PCI	-	
HP Z Turbo Drive Dual Pr			
Operating Temperature	32° to 158° F (0° to 70° C)		
Interface	-	4 electrical x4 physical	
Capacity:		PCIe NVMe module)	
HP Z Turbo Drive Dual Pr			
Operating Temperature	32° to 158° F (0°	to 70° C)	
Interface	PCI Express 3.0 x	4 electrical x4 physical	
Capacity:	256GB (one M.2	PCIe NVMe module)	
HP Z Turbo Drive Dual Pr	o 256GB SSD		
		Operating Temperature	32° to 158° F (0° to 70° C)
		Interface	PCI Express 3.0 x4 electrical x4 physical
	HP Z Turbo Drive Quad Pro 2TB SSD module	o Capacity	2TB (one M.2 PCIe NVMe module)
			32° to 158° F (0° to 70° C)
	1TB SSD module	Interface	PCI Express 3.0 x4 electrical x4 physical
	HP Z Turbo Drive Quad Pro	o Capacity	1TB (one M.2 PCIe NVMe module)
		Operating Temperature	32° to 158° F (0° to 70° C)
		Interface	PCI Express 3.0 x4 electrical x4 physical
	HP Z Turbo Drive Quad Pro 512GB SSD module	o Capacity	512GB (one M.2 PCIe NVMe module)
			32° to 158° F (0° to 70° C)
		• ·· -	



NVMe

3DXPoint

Controller

NVM Туре

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



Technical Specifications - Hard Drive Controllers

HARD DRIVE CONTROLLERS

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

QuickSpecs

Technical Specifications - Graphics

GRAPHICS

NVIDIA® Quadro® P400 2GB Graphics	Form Factor	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	Graphics Controller	NVIDIA® Quadro® P400 Graphics Card GP107 GPU 256 NVIDIA® CUDA® cores Max Power: 30 Watts
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 64-bit Memory Bandwidth: 32 GB/s
	Connectors	3mDP Outputs
	Maximum Resolution	DisplayPort™ 1.4: - up to 3x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Image Quality Features	10-bit internal display processing pipeline 10-bit scan-out support
	Display Output	3 mDP Connectors
	Shading Architecture	Full Microsoft DirectX [®] 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL [®] 4.5 DirectX [®] 12 Vulkan™ 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL™
	Available Graphics Drivers	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	
NVIDIA® Quadro® P600 2GB Graphics	Form Factor	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	Graphics Controller	NVIDIA® Quadro® P600 Graphics Card GP107 GPU 384 NVIDIA® CUDA® cores Max Power: 40 Watts
	Bus Type	PCI Express 3.0 x16



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	Memory	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 128-bit Memory Bandwidth: 64 GB/s
	Connectors	4mDP Outputs
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Image Quality Features	10-bit internal display processing pipeline 10-bit scan-out support
	Display Output	4 mDP Connectors
	Shading Architecture	Full Microsoft DirectX [®] 12 Shader Model 5.1
	Supported Graphics APIs	OpenGL [®] 4.5 DirectX [®] 12 Vulkan™ 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL™
	Available Graphics Drivers	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	
NVIDIA® Quadro® P620 2GB Graphics	Form Factor	Dimensions: 2.713" H x 5.7" L Single Slot, Low Profile Cooling: Active Weight: 129 grams
	Graphics Controller	NVIDIA® Quadro® P620 Graphics Card GP107 GPU 512 CUDA cores Max Power: 40 Watts
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 2 GB GDDR5, 2000 MHz Memory Interface: 128-bit Memory Bandwidth: 64 GB/s
	Connectors	4mDP Outputs *
	Maximum Resolution	DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)
	Image Quality Features	10-bit internal display processing pipeline 10-bit scan-out support
	Display Output	4 mDP Connectors
	Shading Architecture	Full Microsoft DirectX 12 Shader Model 5.1
		4 mDP Connectors



	Supported Graphics APIs Available Graphics Drivers	OpenGL 4.5 DirectX 12 Vulkan 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL Microsoft Windows 10 Microsoft Windows 7 Linux®
	Notes	HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html *P620 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
AMD FirePro™ W2100 2GB Graphics	Form Factor	Low Profile, half length (full-height bracket included)
	Graphics Controller	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
	Bus Type	PCI Express® x8, Generation 3.0
	Memory	2GB DDR3 memory Memory Bandwidth: up to 28.8 GB/s Memory Width: 128 bit
	Connectors	2x DisplayPort [™] 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.
	Maximum Resolution	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



- up to 1920 x 1200 x 32 bpp @ 60Hz Image Quality Features Advanced support for 8-bit, 10-bit, and 16-bit per RGB color componentiation of the base of	ıt.
High bandwidth scaler for high quality up and downscaling.	
Display Output 2 x DisplayPort™ 1.2a Maximum number of displays: 2	
Shading Architecture Shader Model 5.0	
Supported Graphics APIs 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	
Available GraphicsWindows10 (64-bit)DriversWindows 7 (64-bit)Linux®	
HP qualified drivers may be preloaded or available from the HP suppor Web site: http://welcome.hp.com/country/us/en/support.html	t
NotesDepending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your mon native input to your card's DisplayPort™ or Mini-DisplayPort™ connect may be required. See www.amd.com/FirePro™ for details.	
NVIDIA® Quadro® P1000 Form Factor Dimensions:2.713" H x 5.7" L 4GB Graphics Single Slot, Low Profile Cooling: Active Weight: 129 grams	
Graphics Controller NVIDIA® Quadro® P1000 Graphics Card GP107-860 GPU 640 NVIDIA® CUDA® cores Max Power: 47 Watts	
Bus Type PCI Express 3.0 x16	
MemorySize: 4 GB GDDR5, 2500 MHzMemory Interface: 128-bit memory interfaceMemory Bandwidth: 80 GB/s memory bandwidth	
Connectors 4mDP Outputs	
Maximum Resolution DisplayPort™ 1.4: - up to 4x 5120 x 2880 x 24 bpp @ 60Hz - supports Multi-Stream Transport (MST)	
Image Quality Features 10-bit internal display processing pipeline 10-bit scan-out support	
Display Output 4 mDP Connectors	
Shading Architecture Full Microsoft DirectX [®] 12 Shader Model 5.1	



	Supported Graphics APIs Available Graphics Drivers	OpenGL [®] 4.5 DirectX [®] 12 Vulkan [™] 1.0 API support includes: CUDA C, CUDA C++, DirectCompute , OpenCL [™] Microsoft Windows 10 Microsoft Windows 7 Linux [®]
	Notes	HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
NVIDIA® Quadro® P2000 5GB Graphics	Form Factor	Dimensions: 4.4"Hx7.9"L Single Slot Cooling: Active Weight: 260 grams
	Graphics Controller	NVIDIA® Quadro® P2000 Graphics Card Power: 75 Watts
	Bus Type	PCI Express 3.0 x16
	Memory	Size: 5GB GDDR5 Memory Bandwidth: 140 GB/s Memory Width: 160-bit
	Connectors	4x DisplayPort™ 1.4
	Maximum Resolution	Factory Configured Option: No adapter included with card After Market Option: No video cable adapter included Additional DVI to VGA, DisplayPort [™] to VGA, DisplayPort [™] to DVI, and DisplayPort [™] to Dual-Link DVI adapters available as accessories. DisplayPort [™] : - up to 5120 × 2880 × 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
		HDMI 2.0 (requires DP to HDMI adapter): 5120 x 2880 x 24 bpp @ 60Hz
	Image Quality Features	12-bit internal display pipeline (hardware support for 12-bit scanout on supported panels, applications and connection)
		Stereoscopic 3D display support including NVIDIA® 3D Vision™ technology, NVIDIA® Mosaic and nView.
	Display Output	Maximum number of displays - 4 direct attached monitors



		Maximum number of monitors across all available NVIDIA® Quadro® P2000 outputs is 4.
	Shading Architecture	Shader Model 5.1
	Supported Graphics APIs	OpenGL [®] 4.5 DirectX [®] 12
		API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran software
	Available Graphics Drivers	Microsoft Windows 10 Microsoft Windows 7 Professional 64bit Linux® - Full OpenGL® implementation, complete with NVIDIA® Quadro® and ARB extensions
		HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Notes	
AMD Radeon™ Pro WX	Form Factor	Low-Profile Single Slot (6.6" Length)
3100 4GB Graphics	Graphics Controller	Polaris12 GL GPU: 512 Stream Processors organized into 8 Compute Units Power: 50 Watts Cooling: Active
	Memory	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit
	Connectors	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
		Additional Mini DisplayPort™-to-DisplayPort™, DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories.
	Maximum Resolution	5K support @ 60Hz • 1x single-cable 5K monitor, or 2x dual-cable 5K monitors 3x 4K support @ 60Hz
	Image Quality Features	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
	Display Output	3 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
	GPU Architecture	Polaris
	Supported Graphics APIs	DirectX [®] 12 OpenGL [®] 4.5 OpenCL™ 2.0





	Available Graphics Drivers	Vulkan™ 1.0		
		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		
	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. 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 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. 		
AMD Radeon™ Pro WX	Form Factor	Low-Profile Single Slot (6.6" Length)		
4100 4GB Graphics	Graphics Controller	Polaris 11 Baffin GL XT GPU: 1024 Stream Processors organized into 16 Compute Units Power: 50 Watts Cooling: Active		
	Memory	4GB GDDR5 memory Memory Bandwidth: 6 Gbps / 96 GB/s Memory Width: 128 bit		
	Connectors	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		
		Additional DisplayPort™-to-VGA or DisplayPort™-to-DVI adapters are available as Factory Configuration or Option Kit accessories.		
	Maximum Resolution	 5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors 4x 4K support @ 60Hz 		
	Image Quality Features	Advanced support for 8-bit and 10-bit per RGB color component. High bandwidth scaler for high quality up and downscaling		
	Display Output	4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support		



	GPU Architecture Supported Graphics APIs Available Graphics Drivers	GCN 4th Generation DirectX°12 OpenGL° 4.5 OpenCL™ 2.0 Vulkan™ 1.0 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	 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. 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 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.
NVIDIA® Quadro® P4000 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 2 x SLI connectors
		Factory Configured Option: No video cable adapter included

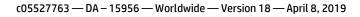


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	After Market Option: No video cable adapter included			
	Additional DisplayPort-to-VGA, DisplayPort-to-HDMI, or DisplayPort-to- DVI adapters are available as accessories			
Maximum Resolution	Dual-link internal TMDS (DVI 1.0): - up to 2560 x 1600 x 32 bpp @ 60 Hz			
	Single-link internal TMDS (DVI 1.0): - up to 1920 x 1200 x 32 bpp @ 60 Hz			
	HDMI™ 2.0b (requires DP to HDMI adapter): - up to 5120 x 2880 x 24 bpp @ 60Hz			
	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)			
	Using two DP outputs, the P4000 can drive one dual DP input display with 5120 x 2880 x 30 bpp @ 60Hz resolution.			
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			
Display Output	Maximum number of displays - 4 direct attached monitors			
	Maximum number of monitors across all available Quadro P4000 outputs is 4.			
Shading Architecture	Shader Model 5.1			
Supported Graphics APIs	OpenGL 4.5 DirectX 12 Vulcan 1.0			
	API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran			
Available Graphics Drivers	Microsoft Windows 10 Microsoft Windows 7 Linux® - Full OpenGL implementation, complete with NVIDIA and ARB extensions			
	HP qualified drivers may be preloaded or available from the HP support Web site:			
	http://welcome.hp.com/country/us/en/support.html			
Notes	 Quadro P4000 offered as Factory Configured Option does not include a video cable adapter. Video cable adapters must be ordered separately. Quadro P4000 offered as an After Market Option does not include 			
	2. Quadro P4000 offered as an After Market Option does not include			



QuickSpecs

NVIDIA® Quadro® P5000 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 ¹	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)
	GPU Architecture	NVIDIA Pascal™





	Supported Graphics APIs Available Graphics Drivers	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 Windows [®] 10 64-bit Windows [®] 7 64-bit Linux [®] 64-bit
	Notes	HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html 1- Supports up to a total of 4 displays
NVIDIA® Quadro® P6000 24GB Graphics	Form Factor	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 967 grams / 2.14 lbs
	Graphics Controller	NVIDIA® Quadro® P6000 graphics GPU: 3840 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
	Memory	24GB GDDR5X memory Memory Bandwidth: Up to 432 GB/s Memory Width: 384 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 Display Outputs ¹	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 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)
	GPU Architecture	NVIDIA Pascal™
	Supported Graphics APIs	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
	Available Graphics Drivers	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:
	Notes	http://welcome.hp.com/country/us/en/support.html1- Supports up to a total of 4 displays
NVIDIA® Quadro® RTX 4000 8GB Graphics	Form Factor	Full-Height Single Slot (4.4" Height x 9.5" Length) Weight: 550 grams / 1.21 lbs
	Graphics Controller	NVIDIA® Quadro® RTX 4000 Graphics TU104 GPU
		GPU: 2304 NVIDIA® CUDA® Parallel Processing Cores Power: 160 Watts Cooling: Active
	Memory	8GB GDDR6 memory Memory Bandwidth: Up to 416 GB/s Memory Width: 384 bit



	Connectors	3x DP 1.4a and VirtualLink 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.
	Maximum Resolution	7680x4320 @ 60Hz
	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
	Display Outputs ¹	3x DP 1.4a and VirtualLink (7680x4320 @ 60Hz)
	Supported Graphics APIs	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
	Available Graphics Drivers	Windows® 10 64-bit Windows® 7 64-bit Linux® 64-bit
	Notes	HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html 1- Supports up to a total of 4 displays
NVIDIA® Quadro® RTX 5000 16GB Graphics	Form Factor	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1050 grams / 2.31 lbs
	Graphics Controller	NVIDIA® Quadro® RTX 5000 Graphics TU104 GPU GPU: 3072 NVIDIA® CUDA® Parallel Processing Cores Power: 265 Watts Cooling: Active



	Memory	16GB GDDR6 memory Memory Bandwidth: Up to 448 GB/s Memory Width: 384 bit
	Connectors	4x DP 1.4a and VirtualLink Quadro Sync connector (compatible with Quadro II Sync) One 8-pin + 6-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	7680x4320 @ 60Hz
	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
	Display Outputs ¹	4x DP 1.4a and VirtualLink (7680x4320 @ 60Hz)
	Supported Graphics APIs	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
	Available Graphics Drivers	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	1- Supports up to a total of 4 displays
NVIDIA® Quadro® RTX 6000 24GB Graphics	Form Factor	Full-Height Dual Slot (4.4" Height x 10.5" Length) Weight: 1070 grams / 2.35 lbs



Graphics Controller	NVIDIA® Quadro® RTX 6000 Graphics TU102 GPU GPU: 4608 NVIDIA® CUDA® Parallel Processing Cores Power: 295 Watts Cooling: Active
Memory	24GB GDDR6 memory Memory Bandwidth: Up to 672 GB/s Memory Width: 384 bit
Connectors	4x DP 1.4a and VirtualLink Quadro Sync connector (compatible with Quadro II Sync) One 8-pin + 6-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	7680x4320 @ 60Hz
Image Quality Features	a 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
Display Outputs ¹	4x DP 1.4a and VirtualLink (7680x4320 @ 60Hz)
Supported Graphics APIs	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
Available Graphics Drivers	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:
Notes	http://welcome.hp.com/country/us/en/support.html1- Supports up to a total of 4 displays



NVIDIA® Quadro®	Form Factor	Dual Slot (4.4" Height x 10.5" Length)
GP100 16GB Graphics	Graphics Controller	Weight: 989 grams +72 grams extender NVIDIA® QUADRO® GP100 GPU: 3584 NVIDIA CUDA® Parallel Processing Cores Power: 235 Watts Cooling: Active
	Memory	16GB HBM2 Memory Bandwidth: Up to 717 GB/s Memory Width: 4096-bit ECC Memory (disabled by default)
	Connectors	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. 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.
	Maximum Resolution	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors
	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
	Display Outputs	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
	GPU Architecture	NVIDIA Pascal™



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Supported Graphics APIs	DirectX®12 , OpenGL® 4.5, Vulkan™ 1.0 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
Available Graphics Drivers	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 (Z840 Workstations): No adapters included Factory Configured (Z4 G4/ Z6 G4/ Z8 G4 Workstations): No adapters included After market option kit: No adapters included

NVIDIA® Quadro® GV100 32GB Graphics	Form Factor Graphics Controller	Dual Slot (4.4" Height x 10.5" Length) Weight: 980 grams + 72 gram extender NVIDIA® QUADRO® GV100 GPU: 5120 NVIDIA® CUDA® Parallel Processing Cores Power: 250 Watts Cooling: Active
	Memory	32GB HBM2 memory Memory Bandwidth: Up to 870 GB/s Memory Width: 5120-bit ECC Memory (disabled by default)
	Connectors	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.
	Maximum Resolution	5K support @ 60Hz 1x single-cable 5K monitor, or 2x dual-cable 5K monitors



	Image Quality Features	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
	Display Outputs	4x DP1.4 HDR2 outputs (up to 5120 x 2880 @ 60Hz)
	GPU Architecture	NVIDIA [®] Volta™
	Supported Graphics APIs	DirectX®12, OpenGL® 4.5 Developer API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL™, Java, Python, and Fortran
	Available Graphics Drivers	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
		Factory Configured (Z4/Z8 G4 Workstation): No adapters included After market option kit: No adapters included
AMD Radeon™ Pro WX	Form Factor	Full-Height Single Slot (9.5" Length)
7100 8GB Graphics	Graphics Controller	Radeon™ Pro WX 7100 graphics GPU: 2304 Stream Processors organized into 36 Compute Units Power: 130 Watts Cooling: Active
	Memory	8GB GDDR5 memory Memory Bandwidth: 7 Gbps / 224 GB/s Memory Width: 256 bit
	Connectors	4x Display Port 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.
	Maximum Resolution	5K support @ 60Hz



Technical Specifications - Graphics

	• 1x single-cable 5K monitor, or 2x dual-cable 5K monitors
Image Quality Features	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color component. High bandwidth scaler for high quality up and downscaling
Display Output	4 full physical DP1.3 HBR3 / DP1.4 HDR outputs FreeSync support
GPU Architecture	GCN 4th Generation
Supported Graphics APIs	DirectX°12 OpenGL [™] 4.5 OpenCL [™] 2.0 Vulkan [™] 1.0
Available Graphics Drivers	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™ 1.4 HDR based on independent verification by DisplayPort™ 1.4 HDR based on independent verification. Video content must be graded in HDR and viewed with an HDR-ready player. Windowed mode content requires operating system support.

Form Factor

Dual Slot (4.4" Height x 10.5" Length)



AMD Radeon™ Pro WX			
9100 16GB Graphics	Graphics Controller	Radeon™ Pro WX 9100 graphics GPU: 4096 Stream Processors Power: 250 Watts Cooling: Active	
Memory16GB HBM2 memoryMemory Bandwidth: Up to 483 0Memory Width: 2048 bit		Memory Bandwidth: Up to 483 GB/s	
	Connectors	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.	
	Maximum Resolution	8K support @ 60Hz Single monitor, single or dual-cable	
	Image Quality Features	Advanced support for 8-bit, 10-bit, and 16-bit per RGB color componen High bandwidth scaler for high quality up and downscaling	
Display Output		6 full physical mDP 1.4 HDR Ready outputs FreeSync support	
	GPU Architecture	Vega™	
	Supported Graphics APIs	5 DirectX [®] 12.1 OpenGL [®] 4.5 OpenCL [™] 2.0 Vulkan [™] 1.0	
	Available Graphics Drivers	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: 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. 	

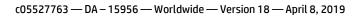


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3. AMD PowerTune and AMD ZeroCore Power are technologies offered by certain FirePro[™] and Radeon[™] Pro products, which are designed to intelligently manage GPU power consumption in response to certain GPU load conditions.

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.

NVIDIA® Quadro® Sync II	Part number	1WT20AA
	Dimensions (HxD)	6.0 inches × 4.2 inches
	Devices Supported	NVIDIA® Quadro® P4000 NVIDIA® Quadro® P5000 NVIDIA® Quadro® P6000
	Bus Type	Requires one free mechanical PCIe bus slot. 6-pin PCI or SATA power connector
	PCI Form Factor	Full Height, half length, single slot
	Ports	2 RJ45 connectors for carrying frame lock signals over CAT5 cables. BNC Connector for external house synchronization.
	Internal Connectors	 6 NVIDIA SLI® style edge fingers for connection to compatible GPUs Included with the board are 4 12-Inch Short Sync Cables to connect to GPU's Included with the board are 2 24-Inch Long Sync Cables to connect to GPU's
	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:





- Quadro Sync II Card
- 4 x 12-Inch Short Sync Cables
- 2 x 24-Inch Long Sync Cables (Two)
- Quick Start Guide

OPTICAL AND REMOVABLE STORAGE

HP 9.5mm Slim DVD Writer	Description Mounting Orientation Interface Type Dimensions (WxHxD) Supported Media Types	9.5mm height, tray-load Either horizontal or vertical SATA/ATAPI 128 x 9.5 x 127mm DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	Disc Capacity	DVD-ROM	8.5 GB DL or 4.7 GB standard
		Full Stroke DVD	< 200 ms (seek)
		Full Stroke CD	< 200 ms (seek)
	Maximum Data Transfer Rates	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
	Power	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
	Operating Environmental (all conditions non- condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 80%
		Maximum Wet Bulb Temperature	84° F (29° C)
	Operating Systems Supported	Windows 10, Windows 7 Professional 64-bit, Windows Vista Business 64*, Windows 2000. Red Hat [®] Enterprise Linux [®] (RHEL) 6, 7 Desktop/Workstation SUSE Linux [®] Enterprise Desktop 12	
		* No driver is required for this device. Native support is provided by the operating system.	
	Kit Contents	HP SATA DVD Writer drive, installat	tion guide.
HP 9.5mm Slim DVD-ROM	Description	9.5mm height, tray-load	
Drive	Mounting Orientation	Either horizontal or vertical	



	Interface Type	SATA / ΑΤΑΡΙ	
	Dimensions (WxHxD)	128 x 9.5 x 127mm	
	Disc Capacity	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	Access Times	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)
	Power	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC – <800mA typical, < 1600 mA maximum
	Operating Environmental	Temperature	41° to 122° F (5° to 50° C)
	(all conditions non-	Relative Humidity	10% to 80%
	condensing)	Maximum Wet Bulb Temperature	84° F (29° C)
Operating Systems Supported		Windows 10, Windows 8.1, Windows 7 Professional 64-bit Red Hat® Enterprise Linux® (RHEL) 6, 7 Desktop/Workstation SUSE Linux® Enterprise Desktop 12	
		No driver is required for this device. operating system.	Native support is provided by the
	Kit Contents	9.5mm Slim DVD-ROM Drive, 5.25" data/power cable, installation guide	ODD Bay adapter/carrier, slim SATA e
	Description	O Farm height travelaged	
HP 9.5mm Slim BDXL Blu- Ray Writer	-	9.5mm height, tray-load	
Nay Writer	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA/ATAPI	
	Dimensions (WxHxD)	128 x 9.5 x 127mm	
	Supported Media Types	BD-ROM BD-R BD-RE DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	Disc Capacity	DVD-ROM	8.5 GB DL or 4.7 GB standard
		Blu-ray	25 GB (single-layer) 50 GB (dual-layer) 100/128 GB (BDXL)
		Full Stroke DVD	< 230 ms (seek)
		Full Stroke CD	< 220 ms (seek)



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	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) 255 / 285
		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
Maximum Data Transfer Rates	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 DL Up to 6X BD-R Up to 6X
		BD-RE SL/DL Up to 6X
Power	Source	SATA DC power receptacle
ruwei	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
	DC Current	5 VDC -900 mA typical, 2000mA
		maximum
Operating Environmental	Temperature	41° to 122° F (5° to 50° C)
(all conditions non- condensing)	Relative Humidity	10% to 80%
-	Maximum Wet Bulb Temperature	84° F (29° C)
Operating Systems Supported	Windows 10, Windows 7 Professional 64-bit, Red Hat® Enterprise Linux® (RHEL) 6, 7 Desktop/Workstation SUSE Linux® Enterprise Desktop 12 No driver is required for this device. Native support is provided by the operating system.	
Kit Contents	 9.5mm Slim BDXL Blu-Ray Writer, 5.25" ODD Bay adapter/carrier, slim SATA data/power cable, installation guide 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. 	



HP SD Card Reader	Description	Supports hardware ECC (Error Correction Code) function Supports hardware CRC (Cyclic Redundancy Check) function Supports SD 4-bit parallel transfer mode
	Interface Type	USB 3.1 Gen 1 High-speed interface
	Dimensions (WxHxD)	1.15 x .9 x .15 in (29.00 x 23.6 x 3.15 mm) Fits conveniently in the Front IO Bay
	Supported Media Types	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. Memory Stick Micro (M2) miniSD
		miniSD High Capacity
		Micro SD Memory Card (MicroSD) Micro SD High Capacity Memory Card (MicroSDHC)
		Test Parameters/Conditions - Power applied, unit operating on system ±5%
	Operating Systems Supported	Windows 10
		No driver is required for this device. Native support is provided by the operating system.
	Kit Contents	Media card reader
	Approvals	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
	Weight	0.35 lbs. (0.16 kg)

Technical Specifications - Controller Cards

CONTROLLER CARDS

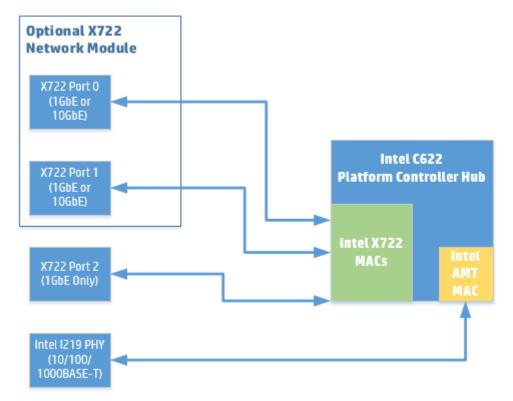
HP Thunderbolt-3 Dual	Data Transfer Rate	Supports up to 40 Gb/s (40,000 Mb/s)
Port2 PCIe 1-port I/O Card	Devices Supported	Thunderbolt™, Thunderbolt™ 2 and Thunderbolt™ 3 certified for Windows devices
	Bus Type	PCIe card, full height PCIe slots
	Ports	Two Thunderbolt™ 3 external USB type-C output connectors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

HP Z6 Gen4 and HP Z8 Gen 4 Integrated Network Architecture



Note: When an optional X722 network module is not installed in the system, a "dummy" port is enumerated as Function 0 of the Intel X722 MACs, which allows for the X722 Port 2 on the Motherboard to enumerate.

Integrated Intel I219LM	Connector	RJ-45
	Controller	Intel I219LM
	Data Rates Supported	10/100/1000 Mbps
	Boot ROM Support	PXE, UEFI
	Connect Speed LED	Link/Activity LED
	Indicators	 Off = No link
		 Blinking = Activity
		Speed LED
		 Off = 10Mbps
		 Amber = 100Mbps

- Green = 1000Mbps
- Management Capabilities Intel[®] Active Management Technology™ 11



Integrated Intel X722 for	Connector	1 RJ-45
1GbE	Controller	Intel X722 for 1GbE
	Data Rates Supported	1000 Mbps
	Boot ROM Support	PXE, UEFI
	Connect Speed LED	Link/Activity LED
	Indicators	• Off = No link
		Blinking = Activity
		Speed LED Off = No Link
		 Green = 1000Mbps
	Management Capabilities	Wake-On-LAN
HP Z Dual 10GbE Network	Networking Interface	2 RJ-45
Module	System Interface	Cabled from Dedicated Rear I/O Slot
	Networking Speeds Supported	1Gbps, 10Gbps
	Cabling (up to 100m)	Cat5e (or higher) for 1Gbps Cat6a (or higher) for 10Gbps
	Power Consumption (active-typical)	5.5W at 1Gbps 11.2W at 10Gbps
	Physical Dimensions	0.875 in x 3 in x 2.75 in
	Connect Speed LED	Link/Activity LED
	Indicators	Off = No link Blinking = Activity
		Blinking = Activity Speed LED
		Amber = 1Gbps
		• Green = 10Gbps
	Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)
Intel [®] I210-T1	Networking Interface	1 RJ-45
	System Interface	PCI Express 2.1 x1
	Networking Speeds Supported	10Mbps, 100Mbps, 1Gbps
	Cabling (up to 100m)	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
	Power Consumption (active-typical)	0.81W
	Physical Dimensions	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)



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	Connect Speed LED Indicators Operating Temperature Hardware Certifications	Link/Activity LED • Off = No link • Blinking = Activity Speed LED • Off = 10Mbps • Green = 100Mbps • Amber = 1Gbps 0 °C to 55 °C (32 °F to 131 °F) USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003
Intel® I350-T2	Networking Interface	2 RJ-45
	System Interface	PCI Express 2.1 x4
	Networking Speeds Supported	10Mbps, 100Mbps, 1Gbps
	Cabling (up to 100m)	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps
	Power Consumption (active-typical)	4.4W
	Physical Dimensions	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)
	Connect Speed LED Indicators	Link/Activity LED • Off = No link • Blinking = Activity Speed LED • Off = 10Mbps • Green = 100Mbps • Amber = 1Gbps
	Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)
	Hardware Certifications	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003
Intel® I350-T4	Networking Interface	4 RJ-45
	System Interface Networking Speeds Supported	PCI Express 2.1 x4 10Mbps, 100Mbps, 1Gbps

Cabling (up to 100m)	Cat3 (or higher) for 10Mbps Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps	
Power Consumption (active-typical)	5W	
Physical Dimensions	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)	
Connect Speed LED Indicators	Link/Activity LED Off = No link Blinking = Activity Speed LED Off = 10Mbps Green = 100Mbps Amber = 1Gbps 	
Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)	
Hardware Certifications	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003	

Aquantia® AQN-108	Networking Interface	RJ-45
	System Interface	PCI Express 3 x1
	Networking Speeds Supported	100Mbps, 1Gbps, 2.5Gbps, 5Gbps
	Cabling (up to 100m)	Cat5e (or higher) for all speeds
	Power Consumption (active-typical)	3.5W at 5Gbps, 3.0W at 2.5Gbps
	Physical Dimensions	3.72 in x 3.18 in (without bracket)
	Connect Speed LED Indicators	Link/Activity LED Off = No link Blinking = Activity Speed LED Off = No link Amber = <5Gbps Green = 5Gbps
	Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)
	Hardware Certifications	USA: FCC B, EU: UL CE, Japan: VCCI, Taiwan: BSMI, Australia/New Zealand: CTICK, Korea: KCC, Canada: ICES-003/NMB-003



QuickSpecs

Intel® X550-T2	Networking Interface	2 x RJ-45
	System Interface	PCI Express 3 x4
	Networking Speeds	100Mbps, 1Gbps, 2.5Gbps, 5Gbps, 10Gbps
	Supported	
	Cabling (up to 100m)	Cat5 (or higher) for 100Mbps Cat5e (or higher) for 1Gbps, 2.5Gbps, or 5Gbps Cat6a (or higher) for 10Gbps
	Power Consumption (active-typical)	3.9W at 100Mbps 5.5W at 1Gbps 11.2W at 10Gbps
	Physical Dimensions	5.2 in x 2.7 in (without bracket)
	Connect Speed LED	Link/Activity LED
	Indicators	• Off = No link
		Blinking = Activity Speed LED
		Off = No link
		• Amber = <10Gbps
		• Green = 10Gbps
	0	
	Operating Temperature Hardware Certifications	0 °C to 55 °C (32 °F to 131 °F)
	naruware certifications	USA: FCC B, EU: UL CE,
		Japan: VCCI,
		Taiwan: BSMI,
		Australia/New Zealand: CTICK,
		Korea: KCC, Canada: ICES-003/NMB-003
Intel® X710-DA2	Networking Interface	2 SFP+ Ports for LC SFP+ Transceivers
10GBASE-SR Converged	System Interface	PCI Express 3.0 x8
Network Adapter		
	Networking Speeds Supported	1Gbps, 10Gbps
	Cabling	LC fiber optic cabling with LC SFP+ Transceivers
	Power Consumption (active-typical)	4.3W
	Physical Dimensions	6.578 in x 2.703 in
	Connect Speed LED	Link/Activity LED
	Indicators	• Off = No link
		Blinking = Activity
		 Speed LED Off = 10Mbps
		 Off = TOMOPS Green = 100Mbps
		 Amber = 1Gbps
	Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)

	Hardware Certifications	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 s	upported
10GbE SFP+ SR	Connector Type	LC
Transceiver	Cable Type	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.
	Cable Length	2-300m
	Wavelength	850nm
	Form Factor	SFP+
	Physical Dimensions	0.47(h) x 0.54(w) x 2.19(d) inches (1.19 x 1.38 x 5.57 cm)
	Operating Temperature	0C to 45C (32F to 113F)
	Operating Humidity	0% to 85%, noncondensing
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
Intel® 9260 WLAN	Networking Speeds	802.11ac MU-MIMO (up to 1.73Gbps using 160MHz channels)
	IEEE WLAN Standards	IEEE 802.11a/b/g/n/ac
	Bluetooth	5.0
	System Interface	PCI Express 2.1 x1
	Antenna	2x2



QuickSpecs

Summary of Changes

SUMMARY OF CHANGES

Date of change:	Version History:		Description of change:
September 20, 2017	From v1 to v2	Added	Specs for the Power Supply section
		Changed	The System Configurations section and changed notes for the NVIDIA
			Quadro P4000, P5000 & P6000 Graphics
November 1, 2017	From v2 to v3	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, Networking and Communications, Other
			Hardware and Memory sections, changed Front view info on the Overview
			section, changed Operating Systems section, changed Processors section,
			changed System Board section, Physical Security and Serviceability section
November 10, 2017	From v3 to v4	Added	Windows 10 to the supporting systems by the 9.5mm Slim DVD-ROM drive
		Removed	Microsemi 3152-8i SAS ROC RAID Controller from SAS controller on the Hard Drive Controllers section.
November 29, 2017	From v4 to v5	Added	Processors, hard drives and graphics to offerings, added Declared Noise Emissions information
		Changed	Wattage links on power supply section updated and Voltage links on efficientcy section updated
January 30, 2018	From v5 to v6	Changed	Factory configured option to yes on Networking and communications for :
January 50, 2010		changeu	Intel® 8265 802.11 a/b/g/n/ac&BT PCIe
		Removed	NVIDIA SLI Graphics Connector from Graphics Cable Adapters section
February 14, 2018	From v6 to v7	Removed	RAID 5 and 10 references from "Factory integrated" in interfaces supported
			section
March 27, 2018	From v7 to v8	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
		Added	Intel Xeon processors added
August 13, 2018	From v8 to v9	Added	Footnote to Networking and Communications section
		Changed	Operating Systems section
September 6, 2018	From v9 to v10	Added	Integrated Network Architecture Diagram on The Networking and
			Communications section
September 6, 2018	From v10 to v11	Changed	Power Supply section
September 21, 2018	From v11 to v12	Added	Intel Optane SSD 905p AiC 280GB & 480GB
November 19, 2018	From v12 to v13	Added	Intel Xeon Gold 6128 processor
		Changed	NVIDIA Quadro P6000 Graphics specs
January 2, 2019	From v13 to v14	Added	NVIDIA Quadro P620 2GB Graphics
January 8, 2019	From v14 to v15	Added	HP DX175 Removable HDD Carrier into the HDD Frame/Carriers section
		Changed	Intel Xeon Gold 6126 processor specs
January 9, 2019	From v15 to v16	Added	Intel Xeon Gold 6126 processor footnote
January 23, 2019	From v16 to v17	Added	Intel 9260 802.11 a/b/g/n/ac&BT PCIe to Networking section and added HP
			Z Turbo Drive Dual Pro series to Storage section
April 8, 2019	From v17 to v18	Added	New Intel Xeon Processors and graphics
		Changed	Storage / Hard Drives, Memory sections and format changes

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