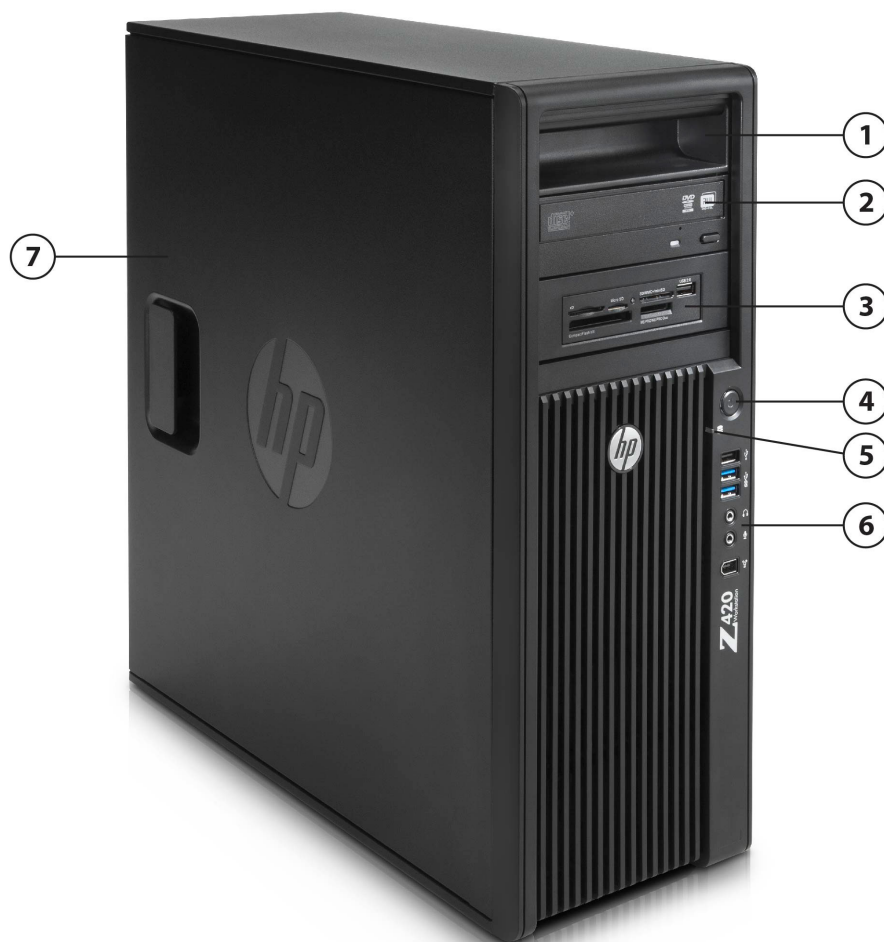# QuickSpecs

Overview

1. Handle in Top Optical Bay (optional)
2. 3 External 5.25" Bays
3. 22-in-1 Media Card Reader (optional)
4. Power Button
5. HDD Activity LED
6. Front I/O: 1 USB 2.0, 2 USB 3.0, 1 Headphone, 1 Microphone, 1 1394a
7. Easy-open Side Panel

Overview

8. 3 External 5.25" Bays

9. 3 Internal 3.5" Bays

10. 8 DIMM Slots for DDR3 ECC Memory

11. 600W, 90% Efficient Power Supply

12. Rear I/O: Rear Power Button & LED, PS/2 Ports, 1 1394a, 4 USB 2.0, 2 USB 3.0, 1 RJ-45 to Integrated GbE, 1 Audio Line In, 1 Audio Line Out, 1 Microphone

13. Intel Xeon Processors E5-1600 family (4C/6C) or E5-2600 family (8C)

14. 2 PCIe x16 Gen3 Slots

15. 1 PCIe x8 Gen3, 1 PCIe x8(x4) Gen2, 1 PCIe x4(x1) Gen2, 1 PCI Slot

16. 6 Internal USB 2.0 Ports

17. 10 SATA Ports

Form Factor	Convertible Minitower
Operating Systems	Preinstalled: ● Genuine Windows® 7 Ultimate 64-Bit* ● Genuine Windows® 7 Professional 32-Bit* ● Genuine Windows® 7 Professional 64-Bit*

Overview

- HP Installer Kit for Linux (includes drivers for 64-bit OS versions of RHEL 5 & 6 and SUSE Linux Enterprise Desktop 11)
- SUSE Linux Enterprise Desktop 11
- Red Hat Enterprise Linux Desktop (Preinstall NOT available; 1 year paper license only)

Supported:

- Genuine Windows® 7 Enterprise 32/64

* Systems may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://www.microsoft.com/windows/windows-7/ for details.

Notes: For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_matrix

Available Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MHz)	QPI Speed (GT/s)	Hyper-Threading	Featuring Intel® vPro™ Tech-nology	Intel® Turbo Boost Tech-nology[1]	TDP (W)
Intel® Xeon® E5-2687W processor	8	3.1	20	1600	8.0	Y	Y	3, 7	150
Intel Xeon E5-2665 processor	8	2.4	20	1600	8.0	Y	Y	4, 7	115
Intel Xeon E5-1660 processor	6	3.3	15	1600	-	Y	Y	3, 6	130
Intel Xeon E5-1650 processor	6	3.2	15	1600	-	Y	Y	3, 6	130
Intel Xeon E5-1620 processor	4	3.6	10	1600	-	Y	Y	2, 3	130
Intel Xeon E5-1607 processor	4	3.0	10	1066	-	N	Y	N/A	130
Intel Xeon E5-1603 processor	4	2.8	10	1066	-	N	Y	N/A	130

Available Processor Disclaimers

Intel's numbering is not a measurement of higher performance. Processor numbers differentiate features within each processor family, not across different processor families. See: http://www.intel.com/products/processor_number/ for details.
64-bit computing on Intel® 64 architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel 64 architecture. Processor will not operate (including 32-bit operation) without an Intel 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. See: http://www.intel.com/info/em64t for more information.
Quad-Core, Six-Core, and Eight-Core technologies are designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefits. Check with software provider to determine suitability. Not all customers or software applications will necessarily benefit from use of these

Overview

	technologies.
Color	Jack Black
Convertibility	Yes. 5.25" drives rotate for Minitower or Desktop orientation.
Expansion Slots (see system board section for more details)	Slot 1 (top): PCI Express Gen2 x4(1)* Full-height, Half-length Slot 2: PCI Express Gen3 x 16 Full-height, Full-length (with extender) Slot 3: PCI Express Gen2 x 8(4)* with open-ended connector** Full-height, Full-length (with extender) Slot 4: PCI Express Gen3 x8 with open-ended connector** Full-height, Full-length (with extender) Slot 5: PCI Express Gen3 x16 Full-height, Full-length (with extender) Slot 6: PCI 32bit/33MHz Full-height, Full-length (with extender) * x<number> = number of lanes or size of the physical/mechanical connector. (number) = number of lanes supported electrically. Typically communicated as x# mechanical, x(#)electrical. ** open-ended connector allow a greater bandwidth (e.g. x16) card to be installed physically into a lower bandwidth connector/slot.
Expansion Bays (see storage section for more details)	3 internal 3.5" bays (with acoustic dampening rail assemblies pre-installed) 3 external 5.25" bays (4th HDD occupies one external bay) Top and Middle 5.25" bay device depth limit: 206mm (8.11 inches) Bottom 5.25" bay device depth limit: 173mm (6.81 inches)
Front I/O	2 USB 3.0, 1 USB 2.0, 1 IEEE 1394a standard, 1 Headphone,1 Microphone
Internal I/O	6 USB 2.0 ports available by three separate 2x5 headers: each header supports either a HP Internal USB Port Kit or USB Media Card Reader, one on each header. Each Internal Port Kit has two USB 2.0 connectors.
Rear I/O	2 USB 3.0, 4 USB 2.0,1 IEEE 1394a port, 2 PS/2, RJ-45 (NIC), 1 Audio Line-In, 1 Audio Line-Out, 1 Microphone Serial supported with optional connector on PCI bracket cabled to system board connector
Interfaces Supported	22-in-1 Media Card Reader (optional) 10-channel SATA interface (2 @ 6.0 Gb/s, 8 @ 3.0 Gb/s). 6 channels are eSATA configurable (2 @ 6Gb/s, 4 @ 3Gb/s) for use with eSATA CTO/AMO Kit. USB 2.0, USB 3.0, IEEE 1394a interface
On-board RAID Support	TBD

QuickSpecs

Overview

Chassis Dimensions (HxWxD)	Standard minitower orientation: 44.76 x 17.78 x 44.52 cm (17.63 x 7.0 x 17.5 in) Converted desktop orientation: 17.9 x 44.76 x 44.52 cm (7.0 x 17.63 x 17.5 in)	
Weight	Exact weights depend upon configuration. Minimum: 12.5kg (27.5 lbs) Standard: 13.2kg (29.2 lbs) Maximum: 17.7kg (39 lbs)	
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% relative humidity, non-condensing
	Non-operating	8% to 90% relative humidity, non-condensing
Maximum Altitude (non-pressurized)	Operating:	3,048m (10,000ft)
	Non-operating	9,144m (30,000ft)
Power Supply	600 watts wide-ranging, active Power Factor Correction, 90% Efficient The Z420 600W power supply efficiency report can be found at this link: TBD	
Workstation ISV Certifications	See the latest list of certifications at http://www.hp.com/united-states/campaigns/workstations/partnerships.html	

Supported Components

Processors

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Intel Xeon E5-2600 Series - CTO				
Intel® Xeon® Processor E5-2687W 8C 3.10GHz	Y	N		See note 1
Intel® Xeon® Processor E5-2665 8C 2.40GHz	Y	N		
Intel Xeon E5-1600 Series				
Intel® Xeon® Processor E5-1660 6C 3.30GHz	Y	N		
Intel® Xeon® Processor E5-1650 6C 3.20GHz	Y	N		
Intel® Xeon® Processor E5-1650 6C 3.20GHz	Y	N		
Intel® Xeon® Processor E5-1620 4C 3.60GHz	Y	N		
Intel® Xeon® Processor E5-1607 4C 3.00GHz	Y	N		
Intel® Xeon® Processor E5-1603 4C 2.80GHz	Y	N		

Note 1: HP Liquid Cooling option available for all the above processors. HP Liquid Cooling option is required on the E5-2687W processor model.
Note 2: Intel's numbering is not a measurement of higher performance.

Hard Drives

SAS Hard Drives

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations				
600GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	VM647AA	
450GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	LU968AA	
300GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	LU967AA	
HP 300GB SAS 10K SFF HDD	Y	Y	A2Z20AA	
HP 600GB SAS 10K SFF HDD	Y	Y	A2Z21AA	

Sub-Section Description/Notes

Up to (4) 3.5-inch 15K rpm SAS drives: 300, 450, 600 GB; 2.4 TB max

Up to (4) 2.5-inch 10K rpm SAS drives: 300, 600 GB; 2.4 TB max

NOTE: SAS controller add-in card required

NOTE: 4th SFF HDDs will be automatically installed into the top optical bay in a Handle/HDD carrier

Removable Boot Drive option

SATA Hard Drives

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
SATA (Serial ATA) Hard Drives for HP Workstations				
250GB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ034AA	
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ036AA	
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	LQ037AA	

Supported Components

2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	QB576AA	
3.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	Y	Y	QF298AA	

Sub-Section Description/Notes

Up to (4) 3.5-inch 7200 rpm SATA drives: 250, 500 GB, 1.0, 2.0, 3.0 TB; 11.0 TB max

NOTE: 3.0 TB drive not available as HDD1

Removable Boot Drive option

SATA Solid State Drives   HP Solid State Drives (SSDs) for Workstations

HP 300GB SATA SSD	Y	Y	LZ069AA
HP 160GB SATA SSD	Y	Y	LZ704AA
HP 256GB SATA SSD	Y	Y	A3D26AA
HP 128GB SATA SSD	Y	Y	A3D25AA

Up to (4) 2.5-inch SATA Solid State Drives: 160, 300 GB: 1.2 TB max

NOTE: 128, 256 GB Solid State Drives only available as HDD1

NOTE: 4th SSDs will be automatically installed into the top optical bay in a Handle/HDD carrier

For hard drives, 1 GB = 1 billion bytes; TB = 1 trillion bytes. Actual formatted capacity is less.

Hard Drive Controllers		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	Integrated SATA 6.0 Gb/s Controller				
	Integrated SATA 6.0 Gb/s Controller	Y	N		Two ports
	Integrated SATA 3.0 Gb/s Controller				
	Integrated SATA 3.0 Gb/s Controller	Y	N		Eight ports
	Factory integrated RAID on motherboard for SATA drives				
	RAID 0 Configuration - Striped Array	Y	N		See note 1
	RAID 0 Data Configuration -- Boot/OS Drive + 2 Drive Striped Array	Y	N		See note 1
	RAID 1 Configuration - Mirrored Array	Y	N		See note 1
	RAID 10 Configuration - Striped/Mirrored Array	Y	N		See note 1
	LSI 9212 4-Port SAS 6Gb/s RAID Card				
	LSI 9212 4-Port SAS 6Gb/s RAID Card	Y	Y	XP310AA	See note 2 and 3
	LSI MegaRAID® 9260-8i SAS 6Gb/s ROC RAID Card and iBBU08 Battery Backup Unit				
	LSI MegaRAID® 9260-8i SAS 6Gb/s ROC RAID Card	N	Y	WE465AA	See note 2 and 3
	Optional: LSI iBBU08 Battery Backup Unit for LSI 9260-8i	N	Y	LA783AA	

SATA hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.

Supported Components

All drives must be identical in type and capacity

All RAID arrays must be less than 2 TB

NOTE 1: Requires hard drives with identical speed, capacity, and interface. Specific user-configured hardware SAS RAID configurations are supported on this Linux system. Please visit: http://www.hp.com/support/linux_hardware_matrix for details.
NOTE 2: Specific user-configured hardware SAS RAID configurations are supported on this Linux system. Please visit: http://www.hp.com/support/linux_hardware_matrix for details.
NOTE 3: Not supported when HD drive 1 is SATA

Graphics

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes	Supported Multi Mixed
Professional 2D					
AMD FirePro 2270 512MB Graphics Card	Y	Y	LA524AA	See note 1	3
NVIDIA NVS300 512MB PCIe Graphics Card	Y	Y	XP612AA	See note 1	3
NVIDIA NVS 310 512MB Graphics Card	Y	Y	A7U59AA		2
NVIDIA Quadro NVS 450 512 MB PCIe Graphics Card	Y	Y	FH519AA	See note 2	2
Entry 3D					
NVIDIA Quadro 410 512MB Graphics	Y	Y	A7U60AA		2
NVIDIA Quadro 600 1GB Graphics Card	Y	Y	WS093AA		2
AMD FirePro V3900 1GB Graphics Card	Y	Y	A6R69AA		2
AMD FirePro V4900 1GB Graphics Card	Y	Y	A3J92AA		2
Mid-range 3D					
NVIDIA Quadro 2000 1GB Graphics Card	Y	Y	WS094AA		2
AMD FirePro V5900 2GB Graphics	Y	Y	LS992AA		2
High End 3D					
AMD FirePro V7900 2GB Graphics	Y	Y	LS993AA		1
NVIDIA Quadro 4000 2GB Graphics Card	Y	Y	WS095AA		1
NVIDIA Quadro 5000 2.5GB Graphics Card	Y	Y	WS096AA		1

NOTE 1: For thermal reasons, when configuring a 3rd NVS 300 or NVS 310 as an After Market Option, customers must also install the Fan and Front Card Guide Kit (A2Z46AA).
NOTE 2: If 1st graphics card is NVS 450 then 2nd graphics card must be NVS 450 or NVS 310.

Supported Components

High Performance GPU Computing		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	NVIDIA Tesla C2075 Compute Processor	Y	Y	QB035AA	See note 1

NOTE 1: Tesla C2075 does not have an operational graphics output and is only supported in combination with NVIDIA Quadro 410 1st graphics.

Memory	CTO	Option Kit Part Number	Support Notes
	DDR3-1600 ECC Unbuffered DIMMs - CTO		
	8GB DDR3-1600 ECC Unbuffered RAM		
	4GB DDR3-1600 ECC Unbuffered RAM		
	2GB DDR3-1600 ECC Unbuffered RAM		

Sub-Section Description/Notes

For details on the supported memory configurations on the HP Z420 Workstation, please refer to the System Technical Specifications - System Board section toward the beginning of this document. DIMMs should be distributed across all four memory channels for optimal performance.

Each processor supports up to 4 channels of DDR3 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 1066MHz capable CPU is used in the system, the maximum speed the memory will run at is 1066MHz regardless of the specified speed of the memory.

AMO

	DDR3-1600 ECC Unbuffered DIMMs - AMO		
	HP 8GB (1x8GB) DDR3-1600 ECC RAM	A2Z50AA	
	HP 4GB (1x4GB) DDR3-1600 ECC RAM	A2Z48AA	
	HP 2GB (1x2GB) DDR3-1600 ECC RAM	A2Z47AA	

NOTE: Only unbuffered DDR3 DIMMs are supported.

Multimedia and Audio Devices		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
	Integrated Intel/Realtek HD ALC262 Audio	Y	N		
	HP Thin USB Powered Speakers	Y	Y	KK912AA	

Supported Components

Optical and Removable Storage

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 16X DVD-ROM SATA Drive (non Lightscribe)	Y	Y	AR629AA	See note 1
HP 16X DVD+/-RW SuperMulti SATA Drive (non-Lightscribe)	Y	Y	QS208AA	
HP Blu-ray Writer	Y	Y	AR482AA	See note 2
HP 22-in-1 Media Card Reader Kit (Workstations)	Y	Y	NK361AA	

Actual speeds may vary. 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. 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.

NOTE 1: Not supported as a 2nd drive option.
NOTE 2: Cannot be ordered in combination with another Blu-ray Writer.

Controller Cards

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP IEEE 1394b FireWire PCIe Card	Y	Y	NK653AA	

Networking and Communications

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Broadcom NetXtreme Gigabit Ethernet Plus NIC (PCIe)	Y	Y	FS215AA	See notes 1 and 2
Intel Gigabit CT Desktop NIC	N	Y	FH969AA	See note 2
HP NC360T PCI Express Dual Port Gigabit NIC	N	Y	KU004AA	See note 2
HP Wireless NIC 802.11b/g/n PCIe Card	N	Y	FH971AA	

NOTE 1: This is a PCI Express card based on the Broadcom 5761 chip. This card does not support DASH 1.1 manageability on this platform.
NOTE 2: "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

Supported Components

Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Security Cable with Kensington Lock	N	Y	PC766A	
HP Solenoid Hood Lock & Hood Sensor	Y	N		
HP (CMT) Solenoid Lock	N	Y	DE618A	

Input Devices

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP PS/2 Standard Keyboard	Y	Y	DT527A	
HP USB Standard Keyboard	Y	Y	DT528A	
HP PS/2 Optical Scroll Mouse	Y	Y	EY703AA	
HP USB 2-Button Optical Scroll Mouse	Y	Y	DC172B	
HP USB Laser Mouse	Y	Y	GW405AA	
HP USB Optical 3-Button Mouse	Y	Y	DY651A	
HP USB Smart Card Keyboard	N	Y	ED707AA	
HP 2.4GHz Wireless Keyboard & Mouse	N	Y	NB896AA	
HP USB Optical 3-Button 2.9M OEM Mouse	N	Y	ET424AA	
HP SpaceExplorer 3D USB Controller	N	Y	RY429AA	
HP SpacePilot 3D USB Intelligent Controller	N	Y	WH343AA	

Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Z420 Handle in Top Optical Bay	Y	Y	A9A48AA	See note 1
HP Z4 Fan and Front Card Guide Kit	Y	Y	A2Z46AA	
HP Serial Port Adapter	Y	Y	PA716A	
HP eSATA PCI Cable Kit	Y	Y	GM110AA	
HP Internal USB Port Kit	N	Y	EM165AA	
HP Optical Bay HDD Mounting Bracket	N	Y	NQ099AA	
HP Power Cord Kit	N	Y	DM293A	
Configure minitower in desktop orientation	Y	N		
HP Workstation Mouse Pad	Y	N		Japan only
HP Energy Star Enabled Configuration	Y	N		

NOTE 1: The HP Z420 Handle in Top Optical Bay kit, which contains two SFF internal drive bays, is installed automatically when customers order a 4th SFF hard drive.

Supported Components

Software

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Performance Advisor	Y	N		See note 1
HP Remote Graphics Software (RGS) V5	Y	N		See note 2
HP ProtectTools Security	Y	N		See note 3
MS Office Home & Business 2010	Y	N		See note 4
HP Power Assistant	Y	N		
Roxio Easy Media Creator (DVD/Blu-ray Disc burner software)	Y	N		
Intervideo WinDVD (DVD player/burner software	Y	N		
PDF Complete - Trial Edition	Y	N		

NOTE 1: Available as a free download here: www.hp.com/go/performanceadvisor
NOTE 2: Supports both 32 and 64 bit versions of Windows 7 Professional and Enterprise, Windows XP Professional and Enterprise, and RHEL V6
NOTE 3: Must select as a Configure to Order option. Delivered as a "Drop in the Box" CD
NOTE 4: Must select as a Configure to Order option

Operating Systems

	Support Notes
Genuine Windows® 7 Ultimate 64-bit	See note 1
Genuine Windows® 7 Professional 32-bit	See note 1
Genuine Windows® 7 Professional 64-bit	See note 1
SUSE Linux Enterprise Desktop 11	
HP Linux Installer Kit	
Red Hat Enterprise Linux (RHEL) Workstation - Paper License (1yr)	See note 2

NOTE 1: See http://www.microsoft.com/windows/windows-7/ for support details.
NOTE 2: This second OS must be ordered with the HP Linux Installer Kit as the first OS.

System Technical Specifications

	NOTE: Restricted Material Usage updated to match GSE.

System Board

System Board Form Factor	ATX 243.84 x 304.8 mm (9.6 x 12 inches)
Processor Socket	Single LGA2011
CPU Bus Speed	QPI: Up to 8.0GT/sec
Chipset	Intel® C602 Chipset
Super I/O Controller	Nuvoton NPCD379H (SIO-12)
Memory Expansion Slots	8 DDR3 memory slots
Memory Type Supported	DDR3, UDIMM (Unbuffered), ECC
Memory Modes	Channel Interleaved
Memory Speed Supported	1066MHz, 1333MHz, and 1600MHz DDR3
Memory Protection	ECC available on data, parity on address and command
Memory	
Memory Configuration Table	Please refer to the table below for details on how supported memory configurations are installed in your system.

		Front Slots				Rear Slots			
Capacity (GB)	Type	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7	DIMM 8
2	UDIMM	2GB							
4	UDIMM	2GB							2GB
6	UDIMM	2GB		2GB					2GB
8	UDIMM	2GB		2GB			2GB		2GB
16	UDIMM	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB
16	UDIMM	4GB		4GB			4GB		4GB
32	UDIMM	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
32	UDIMM	8GB		8GB			8GB		8GB
64	UDIMM	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB
Slot Load Order		1	5	3	7	8	4	6	2

For a detailed diagram, please refer to the label located on the inside of the system side panel.	
Maximum Memory	Supports up to 64GB
Memory Configuration (Supported)	Only ECC DIMMs are supported.
Note on Maximum Memory	*Maximum memory capacities assume 64-bit operating systems such as Genuine Windows® 7 Ultimate 64-bit or Genuine Windows® 7 Professional 64-bit. Genuine Windows® 7 Professional 32-bit supports up to 4GB. Linux 32-bit supports up to 8GB.
PCI Express Connectors	2 x16 PCIe Gen2 1 x8 PCIe (x4)Gen2 1 x8 PCIe (x4) Gen1
PCI Connectors (5.0V)	2 PCI
Supported Drive Interfaces	SATA — Integrated 6-channel SATA 3.0Gb/sec controller with RAID 0, 1, 5, 10 and NCQ. (Factory integrated RAID is Microsoft Windows

System Technical Specifications

		only)
	Serial Attached SCSI	Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit: http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf for RAID capabilities with Linux.
	Integrated RAID	NOTE: Requires identical hard drives (speeds, capacity, interface)
	Integrated Graphics	No
	Network Controller	Integrated HP Gbit LAN by Broadcom with the following management capabilities: WOL, PXE 2.1 and ASF 2.0
	External SATA (eSATA)	4 ports are eSATA configurable with optional eSATA After-Market Option cable kit.
	IDE connector	No
	Floppy connector	Yes
	Audio	High Definition Integrated Realtek ALC262 Audio with Line in, Line Out, Microphone, Headphone
	CD-ROM input (Audio)	No
	AUX INPUT (Audio)	Yes
IEEE 1394 Connector(s)	Front	6-DIMM Z400: 1 IEEE 1394a standard
	Rear	2 optional IEEE 1394a or IEEE 1394b, requires optional PCI card
	Internal	No
USB Connector(s)	Front	2 USB 2.0
	Rear	6 USB 2.0; 2 USB 3.0, requires optional PCIe card
	Internal	4 USB 2.0 ports available by two separate 2x5 headers: supports either up to two HP Internal USB Port Kits, AMO-EM165AA (one port on each Kit), or up to two USB Media Card Readers, or one Internal Port kit and one USB Media Card Reader.
HD Integrated Audio		High Definition Integrated Realtek ALC262 Audio with Line in, Line Out, Microphone, Headphone
Flash ROM		Yes
CPU Fan Header		Yes
Chasiss Fan Header		1 Rear System Chassis Fan Header, 1 Optional Front Chassis Fan Header
Front PCI Fan Header		Yes
Front Control Panel/Speaker Header		Yes
CMOS Battery Holder - Lithium		Yes
Integrated Trusted Platform Module		Integrated TPM 1.2
Power Supply Headers		Yes

System Technical Specifications

Power Switch, Power LED & Hard Drive LED Header	Yes
Clear Password Jumper	Yes
Serial Port	Single Port (Requires optional Serial Port Adapter)
Parallel Port	No
Keyboard/Mouse	USB or PS/2

Z420 Required power supply info

Power Supply	600W 90%, Custom (Wide Ranging, Active PFC)
Operating Voltage Range	90 - 269 VAC
Rated Voltage Range	100-240 VAC
Rated Line Frequency	50-60 Hz
Operating Line Frequency Range	47 - 66 Hz
Rated Input Current	10A @ 100-127 VAC 6A @ 200-240 VAC
Heat Dissipation	Typical: TBD btu/hr (TBD kg-cal/hr) Maximum: TBD btu/hr (TBD kg-cal/hr)
Power Supply Fan	92x25 mm variable speed
ENERGY STAR Qualified (Configuration dependent)	NO
80 PLUS® Compliant	Yes, 90% Efficient The 600W Z420 power supply efficiency report can be found at this link: TBD
FEMP Standby Power Compliant @115V (Wake-on LAN disabled) (<2W in S5 - Power Off)	YES
EuP Compliant @ 230V (<1 W in S5 - Power Off)	YES
Power Consumption in sleep mode (as defined by ENERGY STAR) - Suspend to RAM (S3) (Instantly Available PC) measured at 115V.	<6W
Built-in Self Test LED	YES
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V)	YES
Hood Lock Header	YES
Hood Sensor Header	YES
Memory Fan	1 Memory Fan Header
ErP Lot 6 Tier 2, 230V (Wake-on LAN disabled)(<0.5W in S5 - Power Off)	Yes
CECP Compliant, 220V (Wake-on LAN disabled)(<4W in S3)	Yes, Config Dependent

System Technical Specifications

System Configuration

Example Configuration	Processor Info Memory Info Graphics Info Disks/Optical/Floppy PSU	xxxxx xxxxx xxxxx xxxxx xxxxx					
Energy Consumption		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)						
	Windows Busy Typ (S0)						
	Windows Busy Max (S0)						
	Sleep (S3)						
	Off (S5)						
	Zero Power Mode (EuP)						
Heat Dissipation**		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)						
	Windows Busy Typ (S0)						
	Windows Busy Max (S0)						
	Sleep (S3)						
	Off (S5)						
	Zero Power Mode (EuP)						

Declared Noise Emissions (Entry-level and High-end configurations)

System Configuration (Entry level)	Processor Info	Intel Xeon E5-2665 2.40 GHz
	Memory Info	4 - DDR3 2 GB 1600 MHz UDIMM
	Graphics Info	NVIDIA Q400
	Disks/Optical/Floppy	Single 500 GB 7200 RPM SATA DVD-RW

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels
	Idle	3.4	18
	SATA Hard drive Operating (random reads)	3.6	18
	DVD-ROM Operating (sequential reads)	5.2	37

System Configuration (High-end)	Processor Info	Intel Xeon E5-1660 3.30 GHz
	Memory Info	8 - 4 GB DDR3 1600 MHz UDIMM
	Graphics Info	NVIDIA Q4000
	Disks/Optical/Floppy	2 - 600 GB 15K RPM SAS 3.5" DVD-RW

System Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels
	Idle	4.9	32
	SATA Hard drive Operating (random reads)	5.0	33
	DVD-ROM Operating (sequential reads)	5.3	41

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: 3,000 m (10,000 feet) Non-operating: 9,100 m (30,000 feet)
	Dynamic (new)	Shock Operating: ½-sine: 40g, 2-3ms Non-operating: ½-sine: 160 cm/s, 2-3ms (~100g) 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 Non-operating random: 2.0g (rms), 10-500 Hz NOTE: Values do not indicate continuous vibration.
	Cooling	Above 1524 m (5,000 ft) altitude, maximum operating temperature is de-rated by 1° C (1.8° F) per 305 m (1,000 ft) elevation increase

Physical Security and Serviceability

Access Panel	Tool-less Includes system board and memory information
Optical Drive	Tool-less, no carrier or rails required.
Hard Drives	Tool-less Integrated blind-mate drive carriers Optional 5.25" external bay carriers
Expansion Cards	Tool-less
Processor Socket	1st socket on main system board. 2nd socket on optional 2nd CPU/Memory Module.
Green User Touch Points	Yes, on primary serviceable components
Color-coordinated Cables and Connectors	Yes
Memory	Tool-less
System Board	Tool-less 2nd CPU/Memory Module: Tool-less

System Technical Specifications

Dual Color Power and HD LED on Front of Computer	Yes
Configuration Record SW	Yes
Over-Temp Warning on Screen	Yes, at POST screen on reboot
Restore CD/DVD Set	Yes, restores the computer to its original factory shipping image - Can be obtained via HP Support.
Dual Function Front Power Switch	Yes, also acts as a reset switch when held for 4 seconds.
Padlock Support	No
Cable Lock Support	Yes, Kensington Cable Lock (optional): Prevents entire system theft only. 3mm x 7mm slot at rear of system
Universal Chassis Clamp Lock Support	No
Solenoid Lock and Hood Sensor	Access Panel Solenoid Lock: Yes (optional). Activated remotely to prevent system entry. Access Panel Intrusion Sensor: Yes (optional).
Rear Port Control Cover	No
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Yes, enables or disables serial, USB, audio, and network ports
Removable Media Write/Boot Control	Yes, user can prevent the workstation from writing to or booting from removable media.
Power-On Password	Yes, prevents an unauthorized person from booting up the computer.
Setup Password	Yes, prevents an unauthorized person from changing the system configuration.
3.3V Aux Power LED on System PCA	Yes
NIC LEDs (integrated) (Green & Amber)	Yes
CPUs and Heatsinks	CPU heatsink removal requires a T-15 Torx or flat blade screwdriver. CPU removal is tool-less.
Power Supply Diagnostic LED	Yes
Front Power Button	Yes
Rear Power Button	Yes
Front Power LED	Yes, blue (normal), red (fault)
Front Hard Drive Activity LED	Yes, green
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	1 - 92mm
CPU Heatsink Fan	1st CPU: 1 - 92mm Optional 2nd CPU: 1 - 92mm

System Technical Specifications

Memory Heatsink Fan	System Board Memory: rear bank: 1 - 60mm, front bank: 1 - 40mm Optional 2nd CPU/Memory Module: rear bank: 1 - 80mm.
HP Vision Diagnostics Offline Edition	HP Vision Diagnostics Offline Edition The diagnostics utility enables you to perform testing and to view critical computer hardware and software configuration information from various sources. This utility enables you to: • Run diagnostics • View the hardware configuration of the system Key features and benefits HP Vision Diagnostics simplifies the process of effectively identifying, diagnosing, and isolating the hardware issues. In addition to robust management tools, service tools can be invaluable in quickly resolving system problems. To streamline the service process and resolve problems quickly, it is necessary to have the right information available at the time that a service call is placed. The primary information requirement, which is also the one that provides the greatest Vision into potential system issues, is the configuration of the system. Vision diagnostics helps provide higher system availability. Typical uses of the Vision Diagnostics are: • Testing and diagnosing apparent hardware failures • Documenting system configurations for upgrade planning, standardization, inventory tracking, disaster recovery, and maintenance • Sending configuration information to another location for more in-depth analysis
Access Panel Key Lock	Yes, prevents removal of the access panel and all internal components including devices installed in the external 5.25" bays.
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 with optional ProtectTools Software	Yes, Infineon SLB9635TT1.2
Integrated Chassis Handles	Yes
Power Supply	Tool-less. Includes integrated handle.
PCI Card Retention	Yes, tool-less Rear (all) Middle (full-height cards) Front (full-length cards with extender)
Flash ROM	Yes
Diagnostic Power Switch LED on board	Yes
Clear Password Jumper	Yes
Clear CMOS Button	Yes
CMOS Battery Holder	Yes
DIMM Connectors	Yes

System Technical Specifications

HP ProtectTools Security Manager	Yes - Not supported on Linux

BIOS	
BIOS 32-bit Services	Standard BIOS 32-Bit Service Directory Proposal v0.4
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 Setup Utility (F10)	Review and customize system configuration settings controlled by the BIOS
System/Emergency ROM Flash Recovery with Video	Recovers system BIOS in corrupted Flash ROM
Replicated Setup	Saves BIOS settings to diskette or USB flash device in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
SMBIOS	System Management BIOS 2.7 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 Configuration and Power Management Interface)	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. Supports ACPI 2.0 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

System Technical Specifications

Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system
ROM revision levels	Reports the system BIOS revision level in Computer Configuration Utility (F10 Setup). Version is available through an industry standard interface (SMBIOS) so that management SW applications can use and report this information.
System board revision level	Allows management SW to read revision level of the system board 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 the 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 12 languages with local keyboard mappings
Asset Tag	Allows 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	Fan control parameters are set according to detected hardware configuration for optimal acoustics
Pre-boot Diagnostics	Early (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
ACPI	Advanced Configuration and Power Management Interface, Version 2.0
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 PCI Power Management Specification, Revision 1.1 PCI Firmware Specification, Revision 3.0, Draft .7
PCI Express	PCI Express Base Specification, Revision 2.0
PMM	POST Memory Manager Specification, Version 1.01
SATA	- Serial ATA Specification, Revision 1.0a - Serial ATA 3 Gb/s: Extensions to Serial ATA 1.5 Gb/s, Revision 1.0
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 1.2
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 Universal Serial Bus Revision 3.0 Specification
SMBIOS	System Management BIOS Reference Specification, Version 2.7

System Technical Specifications

Social and Environmental Responsibility	
Eco-Label Certifications & Declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: ● ENERGY STAR® (energy-saving features available on selected configurations-Windows only) ● US Federal Energy Management Program (FEMP) ● China Energy Conservation Program ● IT ECO declaration ● Japan PC Green label *This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'
Batteries	The battery in this product complies with EU Directive 2006/66/EC Battery size: CR2032 (coin cell) Battery type: Lithium Metal Batteries used in the product do 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. http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf Hewlett-Packard 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. This product is brominated flame retardant and polyvinyl chloride-free (BFR/PVC-free); meeting the evolving definition of "BFR/PVC-free" as set forth in the "iNEMI Position Statement on the 'Definition of Low-Halogen Electronics (BFR/CFR/PVC-Free).'" Plastic parts contain <1,000 ppm (0.1 percent) of bromine (if the Br source is from BFRs) and <1,000 ppm (0.1 percent) of chlorine (if the Cl source is from CFRs or PVC or PVC copolymers). All printed circuit board (PCB) and substrate laminates contain bromine/chlorine total <1,500 ppm (0.15 percent) with a maximum chlorine of 900 ppm (0.09 percent) and maximum bromine being 900 ppm (0.09 percent). Service parts after purchase may not be BFR/PVC-free. Exceptions to this claim that may be shipped with the product include the power cord, keyboard, mouse and video adapters which may not be BFR/PVC-free.
BFR/PVC-Free Statement	Configurations of the HP Z420 Workstation where SAS 3 ½" HDDs, Intel SAS Controller Module, Creative Recon3D PCIe Audio Card, Broadcom 5761 Gigabit PCIe NIC, or LSI 9260-8i SAS 6Gb/s ROC RAID Card are not selected are brominated flame retardant and polyvinyl chloride free (BFR/PVC-free), meeting the evolving definition of "BFR/PVC-free" as set forth in the iNEMI Position Statement on the Definition of Low-Halogen Electronics (BFR/CFR/PVC-Free). http://thor.inemi.org/webdownload/projects/ese/HFR-Free/Low-Halogen_Def.pdf
End-of-Life Management and Recycling	Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment, please see the Global Citizenship Report: http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html

System Technical Specifications

Additional Information	This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986). EPEAT Gold - ENERGY STAR qualified configurations of this product are in compliance with the IEEE 1680 (EPEAT) standard at the Gold level where HP registers workstation products. See <Insert platform specific EPEAT link...TBD> for registration status in your country
Packaging	HP Workstation product packaging meets the following (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html: ● Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment (see link above). ● 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. ● Maximize 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. ● Reduce size and weight of packages to improve transportation fuel efficiency. ● Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards
Packaging Materials	
Internal	LDPE Foam and Bag: .465 kg
External	Cardboard carton and insert: 1.610 kg

Manageability	
Industry Standard Specifications	This product meets the following industry standard specifications for manageability functionality: ● DASH 1.1 required functionalities via Intel LAN on motherboard
Intel Active Management Technology (AMT)	Intel Active Management Technology (AMT) 7.0 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 7.0 includes the following advanced management functions: ● Power Management (on, off, reset) ● Hardware Inventory (includes BIOS and firmware revisions) ● Hardware Alerting ● Agent Presence ● System Defense Filters ● SOL/IDER ● Cisco NAC/SDN Support ● ME Wake-on-LAN ● 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

System Technical Specifications

	- PC Alarm Clock - Microsoft NAP Support - Host Base set-up and configuration - Management Engine (ME) firmware roll back
Intel® vPro™ Technology	The HP Z420 Workstation supports Intel vPro technology when configured as outlined below: - Intel Xeon processor E5-1600 product family or E5-2600 product family featuring Intel vPro Technology - Intel C600 series chipset - Intel 82579LM GbE LAN
Remote Manageability Software Solutions	The HP Z420 Workstation is supported on the following remote manageability software consoles: o LANDesk Management Suite (HP recommended solution) o Microsoft System Center Configuration Manager o HP Client Automation Enterprise For questions or support for manageability needs, please visit http://www.hp.com/go/easydeploy
System Software Manager	For questions or support for SSM, please visit: http://www.hp.com/go/ssm
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. NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply. NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24x7 support service may not be available in some countries. HP Care Pack Services extend service contracts beyond the standard warranties. Service starts from date of hardware purchase. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. 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.
Product Change Notification	- Program to proactively communicate Product Change Notifications (PCNs) and Customer Advisories by email to customers, based on a user-defined profile. - PCNs provide advance notification of hardware and software changes to be implemented in the factory providing time to plan for transition. - Customer Advisories provide concise, effective problem resolution, greatly reducing the need to call technical support.

Stable & Consistent Offerings

As part of its commitment to hardware, software, and solution innovation, HP is proud to introduce this breakthrough platform configuration stability to HP Workstation customers. HP Stable & Consistent Offerings are built on the foundation of a carefully chosen set of hardware 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.

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
	A2H76AV	Intel® Xeon® Processor E5-1620 4C 3.60GHz

Hard Drives	Product #	Offering
	QE198AV	HP 500GB SATA 7200 1st HDD
	QE199AV	HP 500GB SATA 7200 2nd HDD
	QE200AV	HP 500GB SATA 7200 3rd HDD
	QE201AV	HP 500GB SATA 7200 4th HDD
	QE190AV	HP 1TB SATA 7200 1st HDD
	QE191AV	HP 1TB SATA 7200 2nd HDD
	QE192AV	1 TB SATA 7200 3rd HDD
	QE193AV	1 TB SATA 7200 4th HDD

Graphics	Product #	Offering
	A7U44AV	NVIDIA NVS 310 512MB Graphics
	A7U45AV	NVIDIA NVS 310 512MB Graphics (2nd)

Memory	Product #	Offering
	QE252AV	2GB (1x2GB) DDR3-1600 ECC Unbuffered RAM
	QE254AV	4GB (2x2GB) DDR3-1600 ECC Unbuffered RAM
	B0Q75AV	6GB (3x2GB) DDR3-1600 ECC Unbuffered RAM
	QE256AV	8GB (4x2GB) DDR3-1600 ECC Unbuffered RAM
	QE258AV	16GB (8x2GB) DDR3-1600 ECC Unbuffered RAM
	QE257AV	16GB (4x4GB) DDR3-1600 ECC Unbuffered RAM
	QE260AV	32GB (8x4GB) DDR3-1600 ECC Unbuffered RAM

Optical and Removable Storage	Product #	Offering
	QE236AV	HP 16X DVD+-RW SuperMulti SATA 1st Drive
	FX682AV	HP 16X DVD+-RW SuperMulti SATA 2nd Drive

Stable & Consistent Offerings

Input Devices	Product #	Offering
	FX677AV	HP 16X DVD+-RW SuperMulti SATA 1st Drive
	QE237AV	HP 16X DVD+-RW SuperMulti SATA 2nd Drive

Operating Systems	Product #	Offering
	QD971AV	Genuine Windows® 7 Professional 64-bit

Technical Specifications - Processors

Processors	Intel® Xeon® Processor E5-2665 8C 2.40GHz
	Intel® Xeon® Processor E5-2687W 8C 3.10GHz
	Intel® Xeon® Processor E5-1660 6C 3.30GHz
	Intel® Xeon® Processor E5-1650 6C 3.20GHz
	Intel® Xeon® Processor E5-1620 4C 3.60GHz
	Intel® Xeon® Processor E5-1607 4C 3.00GHz
	Intel® Xeon® Processor E5-1603 4C 2.80GHz
	Intel Xeon W3690, 3.46GHz, 12MB cache, 1333 memory, 6.4GT/s QPI, Six-Core, HT, Turbo

Processor Note

For detailed processor specifications, please refer to the Overview section at the beginning of this document.

Technical Specifications - Hard Drives

HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations	600GB SAS 15K rpm 6Gb/s 3.5" HDD	Capacity	600GB	
		Height	1 in; 2.54 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.17 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	6.0 Gb/s	
		Buffer	16 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.2 ms
			Average	3.4 ms
			Full Stroke	6.6 ms
		Rotational Speed	15,000 rpm	
		Logical Blocks	1,172,123,568 - 512 byte blocks	
		Operating Temperature	50° to 95° F (10° to 35° C)	
	450GB SAS 15K rpm 6Gb/s 3.5" HDD	Capacity	450GB	
		Height	1 in; 2.54 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.17 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	6Gb/s	
		Buffer	16MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.2 ms
			Average	3.4 ms
			Full Stroke	6.6 ms
		Rotational Speed	15,000 rpm	
		Operating Temperature	50° to 95° F (10° to 35° C)	
	300GB SAS 15K rpm 6Gb/s 3.5" HDD	Capacity	300GB	
		Height	1 in; 2.54 cm	
		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4 in; 10.17 cm
		Interface	SAS	
		Synchronous Transfer Rate (Maximum)	6Gb/s	
		Buffer	16MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.2 ms
			Average	3.4 ms
			Full Stroke	6.6 ms

Technical Specifications - Hard Drives

	Rotational Speed	15,000 rpm	
	Operating Temperature	50° to 95° F (10° to 35° C)	

HP 300GB SAS 10K SFF HDD			
	Capacity	300GB	
	Height	0.6 in; 1.53 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 6.99 cm
	Interface	SAS 6Gb/s	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	64MB	
	Cache	multi-segmentable cache buffer	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.4 ms (max)
		Average	3.6 ms
		Full Stroke	7.3 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	585,937,500	
	Operating Temperature	41° to 131° F (5° to 55° C)	

HP 600GB SAS 10K SFF HDD			
	Capacity	600GB	
	Height	0.6 in; 1.53 cm	
	Width	Media Diameter	2.5 in; 6.36 cm
		Physical Size	2.75 in; 6.99 cm
	Interface	SAS 6Gb/s	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	64MB	
	Cache	multi-segmentable cache buffer	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	0.4 ms (max)
		Average	3.6 ms
		Full Stroke	7.3 ms
	Rotational Speed	10,000 rpm	
	Logical Blocks	1,172,123,568	
	Operating Temperature	41° to 131° F (5° to 55° C)	

SATA (Serial ATA) Hard Drives for HP Workstations	3.0TB SATA 7200 rpm 6Gb/s 3.5" HDD		
	Capacity	3.0TB	
	Height	1 in; 2.54 cm	
	Width	Media Diameter	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	

Technical Specifications - Hard Drives

	Synchronous Transfer Rate (Maximum)	Up to 6.0 Gb/s	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.6 ms
		Average	11 ms
		Full Stroke	Not Specified
	Rotational Speed	7,200 rpm	
	Operating Temperature	41° to 140° F (5° to 60° C)	
1TB SATA 7200 rpm 6Gb/s 3.5" HDD	**Capacity**	1 Terabyte (1000 GB)	
	Height	1 in; 2.54 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4.0 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600 MB/s	
	Buffer	32MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	1,953,525,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500GB SATA 7200 rpm 6Gb/s 3.5" HDD	**Capacity**	500GB	
	Height	1 in; 2.5 cm	
	Width	**Media Diameter**	3.5 in; 8.9 cm
		Physical Size	4 in; 10.17 cm
	Interface	Serial ATA (6.0Gb/s), NCQ enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
	Buffer	16 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2 ms
		Average	11 ms
		Full Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
250GB SATA 7200 rpm 6Gb/s 3.5" HDD	**Capacity**	250 GB	
	Height	1 in; 2.54 cm	

Technical Specifications - Hard Drives

		Width	Media Diameter	3.5 in; 8.9 cm
			Physical Size	4.0 in; 10.17 cm
		Interface	Serial ATA (6.0Gb/s), NCQ enabled	
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2 ms
			Average	11 ms
			Full Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	488,397,168	
		Operating Temperature	41° to 131° F (5° to 55° C)	

HP Solid State Drives for Workstations	HP 160GB SATA SSD	Capacity	160GB	
		Width	Media Diameter	NaN in; NaN cm
			Physical Size	2.5 in; 6.36 cm
		Interface	SATA	
		Synchronous Transfer Rate (Maximum)	3Gb/s	
		Operating Temperature	32° to 158° F (0° to 70° C)	
	HP 300GB SATA SSD	Capacity	300GB	
		Width	Physical Size	2.5 in; 6.36 cm
		Interface	SATA	
		Synchronous Transfer Rate (Maximum)	3Gb/s	
		Operating Temperature	32° to 158° F (0° to 70° C)	

Technical Specifications - Hard Drive Controllers

LSI 9212 4-Port SAS 6Gb/s RAID Card			
PCI Bus	8-lane, 5GT/s PCI Express 2.0		
PCI Modes	Bus Master DMA		
RAID Levels	RAID 0, 1, 1E and 10		
PCI Data Burst Transfer Rate	Half Duplex, x4 PCIe 2000 MB/s Full Duplex, x8 PCIe 4000 MB/s		
SAS Bandwidth	**Half Duplex**	Single lane - 600 MB/s Wide Port (2 lanes) - 1200 MB/s Wide Port (4 lanes) - 2400 MB/s	
	Full Duplex	Single SAS Lane - 1200 MB/s Wide Port (2 lanes) -2400 MB/s Wide Port (4 lanes) - 4800 MB/s	
PCI Card Type	3.3V Add-in card		
PCI Voltage	12 V ± 10%		
PCI Power	13.5 Watts		
Bracket	Full height and Low-profile		
Certification Level	PCI-Express 2.0		
IO Bus	1x4 6Gb/s SAS ports		
SAS Processor	LSISAS2008		
Internal Connectors	Four x1 SATA		
External Connectors	None		
Maximum Number of SCSI Devices	256		
LED Indicators	Internal Activity/Fault per x4 port - Heartbeat		

LSI MegaRAID® 9260-8i SAS 6Gb/s ROC RAID Card and iBBU08 Battery Backup Unit	
PCI Bus	PCI-Express (Gen2) V2.0 x8 lanes
PCI Modes	Bus Master DMA
RAID Levels	RAID 0, 1, 5, and 6 RAID spans 10, 50 and 60
PCI Data Burst Transfer Rate	Up to 4GB/s
PCI Card Type	Low profile, single PCIe slot design with full height bracket. The optional iBBU08 Battery Backup unit mounts on the controller card and the assembly remains within a single PCIe slot width.
PCI Voltage	+3.3V Add-in Card
PCI Power	12.5 Watts
Certification Level	PCI-Express 2.0
IO Bus	Eight 3 Gb/s and 6Gb/s compatible SAS/SATA ports
Internal Connectors	Two SAS SFF8087 x4
External Connectors	None
Maximum Number of SCSI Devices	32. NOTE: HP Workstations do not support this many internal drives.

Technical Specifications - Hard Drive Controllers

LED Indicators	Connector LEDs indicate whether the internal connector is active for ports 0-3 and 4-7

Technical Specifications - Graphics

AMD FirePro 2270 512MB Graphics Card	Form Factor	Low Profile, Half Length, 2.3" x 6.6"
	Graphics Controller	AMD FirePro™ 2270 Professional Graphics
	Bus Type	PCI Express™ x16 Generation 2.0
	Memory	512MB DDR3
	Connectors	DMS-59 connector to support breakout cables for dual DisplayPort, DVI and VGA output. DMS-59 to Dual DVI adapter included. (Display Port and VGA adapters sold separately)
	Maximum Resolution	Digital 2560x1600 (DisplayPort) Analog 1920x1200 (DVI 60 Hz/ VGA 75Hz)
	RAMDAC	400 MHz DAC, 10-bit per channel
	Display Output	Card supports up to two displays
	Supported Graphics APIs	DirectX 11 and OpenGL 4.0
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Power Consumption	17W Maximum

NVIDIA NVS 300 512MB Graphics Card	Form Factor	2.7 inches (H) x 5.7 inches (L), Half-Height
	Graphics Controller	NVIDIA NVS 300 Graphics Board
	Bus Type	PCI Express x16, Generation 2.0
	Memory	512 MB GDDR3 SDRAM unified graphics memory
	Connectors	DMS-59 Includes DMS-59 to Dual DVI-I adapter DMS-59 to Dual DisplayPort adapter and DMS-59 to Dual VGA adapter available as an option DMS-59 to Dual DisplayPort adapter required for HP ZR30w Display
	Maximum Resolution	DVI: two digital displays up to 1920 x 1200 DisplayPort: two digital displays up to 2560 x 1600 VGA: two analog displays up to 1920 x 1080
	Image Quality Features	
	Display Output	This card support up to two displays:

- Drives DVI enabled digital displays at resolutions up to 1920×1200 at 60 Hz with reduced blanking
- Drives DisplayPort enabled digital displays at resolutions up to 2560×1600 at 60 Hz with reduced blanking (through optional DMS-59 to DisplayPort adapter)
- Drives VGA enabled analog displays at resolutions up to 1920 x 1080 (through optional DMS-59 to VGA adapter)

Technical Specifications - Graphics

Supported Graphics APIs	OGL 3.3 DirectX 10.1
Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) 5 Desktop/Workstation Red Hat Enterprise Linux(RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html Novell SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
Power Consumption	<18 Watts

NVIDIA Quadro NVS 450 512 MB PCIe Graphics Card		
Form Factor	ATX Full Height, 1/2 length Passive cooling
Bus Type	PCI Express x16, Generation 2.0
Memory	512 MB GDDR3 (256MB per GPU)
Connectors	Four DisplayPort; Four DisplayPort to DVI-D adapters included. ('DisplayPort to VGA' and 'DisplayPort to Dual Link DVI' adapters available as an accessory)
Maximum Resolution	DisplayPort connectors support ultra-high-resolution panels (up to 2560 x 1600) NOTE: This card supports up to four displays
Supported Graphics APIs	OpenGL 3.0 DirectX 10.0
Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Microsoft Windows Vista (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) 5 Desktop/Workstation Red Hat Enterprise Linux(RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
Power Consumption	<40 Watts

Technical Specifications - Graphics

NVIDIA Quadro 600 1GB Graphics Card		
	Form Factor	2.731" H x 6.6" L Single Slot Small Form Factor
	Graphics Controller	NVIDIA Quadro 600 Graphics Card
	Bus Type	PCI Express 2.0 x16
	Memory	1 GB GDDR3 128-bit
	Connectors	1 DVI-I output, 1DisplayPort output One DP to DVI adapter included with card DVI to VGA, DisplayPort to VGA and DisplayPort to DVI adapters available as accessories
	Maximum Resolution	DisplayPort (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz) Dual-link DVI-I output (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz)
	Shading Architecture	Shader Model 5.0
	Supported Graphics APIs	OpenGL 4.0 DirectX 11 CUDA API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) WS4 (64-bit and 32-bit) * WS4 not supported on Z200 and Z200 SFF Red Hat Enterprise Linux (RHEL) 5 Desktop/Workstation (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	Power Consumption	40 Watts

QuickSpecs

Technical Specifications - Graphics

AMD FirePro V3900 1GB Graphics Card		
	Form Factor	Full height, half length (full-height bracket included)
	Graphics Controller	AMD FirePro™ V3900 professional graphics
	Bus Type	PCI Express® x16, Generation 2.1
	Memory	1GB DDR3 memory
	Connectors	1 DL DVI, 1 DP output One DP to DVI adapter included
	Maximum Resolution	2560x1600 per display (5120x1600 max. horizontal resolution)
	Display Output	1 DisplayPort® 1.2 1 Dual-link DVI
	Supported Graphics APIs	OpenCL™ 1.1, DirectX® 11 and OpenGL 4.2
	Available Graphics Drivers	Genuine Windows® 7 Professional (64-bit and 32-bit) Genuine Windows Vista® Business (64-bit and 32-bit) Microsoft® Windows XP® Professional (64-bit and 32-bit) Linux®* (32-bit or 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
	Power Consumption	<50W
	Note	[1] AMD Eyefinity technology can support multiple displays using a single enabled AMD FirePro™ professional graphics card; the number of supported displays varies by card model. Microsoft® Windows® 7, Windows Vista®, or Linux® is required in order to support more than 2 displays. Depending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your monitor's native input to your card's DisplayPort™ or Mini-DisplayPort™ connector(s) may be required. See www.amd.com/firepro for details. * Linux® drivers can be downloaded from support.amd.com.

AMD FirePro V4900 1GB Graphics Card		
	Form Factor	Full height (4.37 in) , half length (6.61 in)
	Graphics Controller	AMD FirePro™ V4900 Professional Graphics
	Bus Type	PCI Express™ x16, Generation 2.1
	Memory	1GB GDDR5
	Connectors	2 DisplayPort, 1 dual link DVI Output, One DP to DVI adapter included
	Maximum Resolution	Up to three digital displays at resolutions up to 2560 x 1600 @ 60Hz or up to three analog displays, one at resolutions up to 2048 x 1536 @ 85Hz, plus two resolutions up to 1920 x 1200 @ 60Hz (165 MHz dot clock) Note: This card supports up to three displays with Windows 7, Vista or Linux, and up to two displays on XP
	RAMDAC	
	Image Quality Features	Up to 3 independent outputs with ATI Eyefinity technology support (More information at: www.amd.com/us/products/technologies/eyefinity/). Full 30-bit display pipeline. Advanced video capabilities, including high fidelity gamma, color correction and scaling. Dedicated hardware (UVD2) for H.264, VC-1, and MPEG2 decode

QuickSpecs

Technical Specifications - Graphics

	NOTE: The use of more than two displays on Linux requires support for xrandr 1.2 or greater in the X server.
Supported graphics APIs	DirectX 11 and OpenGL 4.1. OpenCL 1.2 DirectCompute 11
Available graphics drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Linux®2 (32-bit or 64-bit) HP qualified drivers may be preloaded or available from the HP support Web site.
Power Consumption	<75W
Note	1. AMD Eyefinity technology can support multiple displays using a single enabled AMD FirePro™ professional graphics card; the number of supported displays varies by card model. Microsoft® Windows® 7, Windows Vista®, or Linux® is required in order to support more than 2 displays. Depending on the card model, native DisplayPort™ connectors and/or certified DisplayPort™ active or passive adapters to convert your monitor's native input to your card's DisplayPort™ or Mini-DisplayPort™ connector(s) may be required. See www.amd.com/firepro for details. 2. Linux® drivers can be downloaded from support.amd.com

NVIDIA Quadro 2000 1GB Graphics Card	Form Factor	4.376" H x 7" L Single Slot
	Graphics Controller	NVIDIA Quadro 2000 Graphics Card
	Bus Type	PCI Express 2.0 x16
	Memory	1 GB GDDR5 128-bit
	Connectors	1 DVI-I output, 2 DisplayPort outputs One DP to DVI adapter included with card DVI to VGA, DisplayPort to VGA and DisplayPort to DVI adapters available as accessories
	Maximum Resolution	Dual DisplayPort (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz) Dual-link DVI-I output (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz)
	Image Quality Features	• Up to 16K x16K texture and render processing • Transparent multisampling and super sampling • 16x angle independent anisotropic filtering • 128-bit floating point performance • 32-bit per-component floating point texture filtering and blending • Support for any combination of two connected displays • DisplayPort 1.1a, HDMI 1.3a, and HDCP support • NVIDIA® 3D Vision™ technology, 3D DLP, Interleaved, and other 3D stereo format support • Full OpenGL quad buffered stereo support • Underscan/overscan compensation and hardware scaling

Technical Specifications - Graphics

		● NVIDIA® nView® multi-display technology
	Shading Architecture	Shader Model 5.0
	Supported Graphics APIs	OpenGL 4.0 DirectX 11 CUDA API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) WS4 (64-bit and 32-bit) * WS4 not supported on Z200 and Z200 SFF Red Hat Enterprise Linux (RHEL) 5 Desktop/Workstation (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	Power Consumption	62 Watts

AMD FirePro V5900 2GB Graphics Card	Form Factor	Full-height, full length, single slot
	Graphics Controller	AMD FirePro™ V5900 Professional Graphics
	Bus Type	PCI Express™ x16, Generation 2.1
	Memory	2GB GDDR5
	Connectors	2 x Display Port 1.2 1 x Dual-link DVI
	Maximum Resolution	2560 x 1600
	Display Output	DirectX 11 and OpenGL 4.1
	Supported Graphics APIs	DirectX 11 and OpenGL 4.1
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Linux® (32-bit or 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
	Power Consumption	< 75W
	Note	Monitors should be same model when using DP-DVI connections to use the Eyefinity feature. There are no additional limitations when using DisplayPort cables.

Technical Specifications - Graphics

AMD FirePro V7900 2GB Graphics Card	Form Factor	Full height, full length, single slot
	Graphics Controller	AMD FirePro™ V7900 Professional Graphics
	Bus Type	PCI Express™ x16, Generation 2.1
	Memory	2GB GDDR5
	Connectors	4 x DisplayPort 1.2
	Maximum Resolution	2560 x1600
	Supported Graphics APIs	DirectX 11 and OpenGL 4.1
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Linux® (32-bit or 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
	Power Consumption	< 150W
	Note	Monitors should be same model when using DP-DVI connections to use the Eyefinity feature. There are no additional limitations when using DisplayPort cables.

NVIDIA Quadro 4000 2GB Graphics Card	Form Factor	4.376" H x 9.50" L Single Slot
	Graphics Controller	NVIDIA Quadro 4000 Graphics Card
	Bus Type	PCI Express 2.0 x16
	Memory	2 GB GDDR5 256-bit
	Connectors	1 DVI-I output, 2 DisplayPort outputs; One DP to DVI adapter included with card DVI to VGA, DisplayPort to VGA and DisplayPort to DVI (single- link or dual-link) adapters available as accessories (Optional stereo bracket available from 3rd party)
	Maximum Resolution	Dual DisplayPort (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz) Dual-link DVI-I output (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz)
	RAMDAC	400 MHz integrated RAMDAC
	Image Quality Features	• Up to 16K x16K texture and render processing • Transparent multisampling and super sampling • 16x angle independent anisotropic filtering • 128-bit floating point performance • 32-bit per-component floating point texture filtering and blending • Support for any combination of two connected displays • DisplayPort 1.1a, HDMI 1.3a, and HDCP support • NVIDIA 3D Vision™ technology, 3D DLP, Interleaved, and other 3D stereo format support • Full OpenGL quad buffered stereo support • Underscan/overscan compensation and hardware scaling

Technical Specifications - Graphics

		● NVIDIA nView® multi-display technology
	Shading Architecture	Shader Model 5.0
	Supported Graphics APIs	OpenGL 4.0 DirectX 11 CUDA API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) WS4 (64-bit and 32-bit) * WS4 not supported on Z200 and Z200 SFF Red Hat Enterprise Linux (RHEL) 5 Desktop/Workstation (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html Novell SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	Power Consumption	142 Watts

NVIDIA Quadro 5000 2.5GB Graphics Card	Form Factor	4.376" H x 9.75" L Dual Slot
	Graphics Controller	NVIDIA Quadro 5000 Graphics Card
	Bus Type	PCI Express 2.0 x16
	Memory	2.5 GB GDDR5 320-bit
	Connectors	DVI-I (1), DP (2), Stereo (1) One DP to DVI adapter included with card DVI to VGA, DisplayPort to VGA and DisplayPort to DVI adapters available as accessories
	Maximum Resolution	Dual DisplayPort (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz) Dual-link DVI-I output (up to 2560 x 1600 @ 60Hz and 1920x1200 @ 120Hz)
	Image Quality Features	● Up to 16K x16K texture and render processing ● Transparent multisampling and super sampling ● 16x angle independent anisotropic filtering ● 128-bit floating point performance ● 32-bit per-component floating point texture filtering and blending ● Support for any combination of two connected displays ● DisplayPort 1.1a, HDMI 1.3a, and HDCP support ● NVIDIA 3D Vision™ technology, 3D DLP, Interleaved, and other 3D stereo format support ● Full OpenGL quad buffered stereo support ● Underscan/overscan compensation and hardware scaling

Technical Specifications - Graphics

	• NVIDIA nView® multi-display technology
Shading Architecture	Shader Model 5.0
Supported Graphics APIs	OpenGL 4.0 DirectX 11 CUDA API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Genuine Windows Vista Business (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) WS4 (64-bit and 32-bit) * WS4 not supported on Z200 and Z200 SFF Red Hat Enterprise Linux (RHEL) 5 Desktop/Workstation (64-bit and 32-bit) Red Hat Enterprise Linux (RHEL) 6 Desktop/Workstation SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html Novell SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
Power Consumption	152 Watts

Technical Specifications - High Performance GPU Computing

NVIDIA Tesla C2075 Compute Processor	Form Factor	4.376 inches by 9.75 inches Dual Slot
	System Interface	PCI Express Gen2 ×16
	Video Outputs	One Dual Link DVI-I
		(Entry graphics level of performance)
	Memory	6GB GDDR5
	Peak Memory Bandwidth	+170 GB/s
	Supported APIs	CUDA API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
	Supported Operating Systems	Genuine Windows 7 Professional (64-bit) Genuine Windows Vista Business (64-bit) Microsoft Windows XP Professional (64-bit) Red Hat Enterprise Linux (RHEL) 5, 6 Desktop/Workstation (64-bit) SUSE Linux Enterprise Desktop 11 (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
		Novell SUSE Linux Enterprise drivers may also be obtained from: ftp://download.nvidia.com/novell or http://www.nvidia.com
	Processor Cores	448 CUDA cores
	Power Consumption	~215 Watts NOTE 1: An 1110W PSU is required for Tesla C2075 on the Z800 NOTE 2: A 600W PSU is required for Tesla C2075 on the Z400

Technical Specifications - Multimedia and Audio Devices

HP Thin USB Powered Speakers	Frequency Response (-3dB, 24-bit/96kHz input)	FO to 20kHz
	Dimensions	Speakers: 14.52 x 9.50 x 2.45 cm (5.72 x 3.74 x 0.96 in) per speaker

Technical Specifications - Optical and Removable Storage

HP DVD-ROM Drive	Description	5.25-inch, half-height, tray-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA/ATAPI	
	Dimensions (WxHxD)	15.0 x 4.4 x 20.3 cm (5.9 x 1.7 x 8.0 in)	
	Disc Capacity	DVD-ROM	Single layer: Up to 4.7 GB Double layer: Up to 8.5 GB
	Access Times	DVD-ROM Single Layer	< 140 ms (typical)
		CD-ROM Mode 1	< 125 ms (typical)
		Full Stroke DVD	< 250 ms (seek)
		Full Stroke CD	< 210 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC - < 600 mA typical, < 1400 mA maximum
	Operating Environmental (all conditions non-condensing)	Temperature	5° to 50° C (41° to 122° F)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	30° C (86° F)
		Operating Systems Supported	Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS4**, 5, 6 Desktop/Workstation, Removed reference to "Novell" because of acquisition and changed product reference to "SUSE Linux Enterprise Desktop 10 & 11", No driver is required for this device. Native support is provided by the operating system.

HP DVD+/-RW Drive	Description	5.25-inch, half-height, tray-load
	Mounting Orientation	Either horizontal or vertical
	Interface Type	SATA/ATAPI
	Dimensions (WxHxD)	15.0 x 4.4 x 20.3 cm (5.9 x 1.7 x 8.0 in)
	Disc Formats	DVD-RAM DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW

Technical Specifications - Optical and Removable Storage

		CD-R CD-RW	
Disc Capacity	DVD-ROM	8.5 GB DL or 4.7 GB standard	
	Full Stroke DVD	< 250 ms (seek)	
	Full Stroke CD	< 210 ms (seek)	
Maximum Data Transfer Rates	CD ROM Read	CD-ROM, CD-R Up to 40X CD-RW Up to 32X	
	DVD ROM Read	DVD-RAM	Up to 12X
		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 16X
		DVD-ROM DL	Up to 8X
		DVD+R	Up to 16X
		DVD-R	Up to 16X
Power	Source	SATA DC power receptacle	
	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
	DC Current	5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum	
Operating Environmental (all conditions non-condensing)	Temperature	5° to 50° C (41° to 122° F)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	30° C (86° F)	
	Operating Systems Supported	Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS4**, 5, 6 Desktop/Workstation SUSE Linux Enterprise Desktop 10 & 11 No driver is required for this device. Native support is provided by the operating system.	
	Kit Contents	HP SATA SuperMulti DVD Writer Drive, Roxio Easy Media Creator software, Intervideo WinDVD Software, installation guide, and DVD+R media.	

HP Blu-Ray Writer	Description	5.25-inch, half-height, tray-load
	Mounting Orientation	Either horizontal or vertical
	Interface Type	SATA
	Dimensions (WxHxD)	15.0 x 4.4 x 20.3 cm (5.9 x 1.7 x 8.0 in)

Technical Specifications - Optical and Removable Storage

Disc Formats	BD-ROM		
	BD-R		
	BD-RE		
	DVD-RAM		
	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	50 GB DL or 25 GB standard	
	Full Stroke DVD	< 250 ms (seek)	
	Full Stroke CD	< 210 ms (seek)	
	Blu-ray	Blu-ray	
	Startup Time (Time to drive ready from tray loading)	BD-ROM (SL/DL)	25S / 28S
		BD-R (SL/DL)	25S / 28S
		BD-RE (SL/DL)	25S / 28S
		DVD-ROM (SL/DL)	18S / 18S
		DVD-R (SL/DL)	25S / 25S
		DVD-RW	25S
		DVD+R (SL/DL)	25S / 25S
		DVD+RW	25S
		DVD-RAM	45S
		CD-ROM	45S
Maximum Data Transfer Rates	CD ROM Read	CD-ROM	Up to 40X
		CD-R	Up to 40X
		CD-RW	Up to 40X
	DVD ROM Read	DVD-RAM	Up to 5X
		DVD+RW	Up to 10X
		DVD-RW	Up to 10X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 8X
		DVD-ROM	Up to 16X
		DVD-ROM DL	Up to 8X
		DVD+R	Up to 12X
		DVD-R	Up to 12X
	Blu-Ray	BD-ROM	Up to 6X
		BD-ROM DL	Up to 4.8X
		BD-R	Up to 6X
		BD-R DL	Up to 4.8X
		BD-R	Up to 6X

Technical Specifications - Optical and Removable Storage

	BD-RE SL/DL	Up to 4.8X
Power	Source	SATA DC power receptacle
	DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 10%-100 mV ripple p-p
	DC Current	5 VDC -900 mA typical, 1200 mA maximum 12 VDC -1000 mA typical, 1600 mA maximum
Operating Environmental (all conditions non-condensing)	Temperature	5° to 50° C (41° to 122° F)
	Relative Humidity	15% to 80%
	Maximum Wet Bulb Temperature	30° C (86° F)
	Operating Systems Supported	Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Enterprise Linux(RHEL) WS4**, 5, 6 Desktop/Workstation, SUSE Linux Enterprise Desktop 10 & 11 * No driver is required for this device. Native support is provided by the operating system. ** RHEL WS4 not supported on Z200/Z200SFF
	Kit Contents	HP Blue Laser RW Drive, Roxio Easy Media Creator software, Intervideo WinDVD Software, installation guide.
Disclaimer		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.

Technical Specifications - Optical and Removable Storage

HP 22-in-1 Media Card Reader	Description	The Media Card Reader device uses the same physical form factor and mounting as a Floppy Disk Drive. The device connects to a 2x5 two-channel USB header on the motherboard of the system. There is no USB controller card provided. Please see the Disc Formats section below for a list of flash memory card formats that are supported.
	Mounting Orientation	The Media Card Reader can be mounted in a dedicated Floppy Drive bay (if the chassis provides one) or in an appropriate Optical Bay adapter. It will operate in any orientation.
	Interface Type	USB 2.0 (one channel dedicated to the separate USB port; one channel dedicated to the flash memory card slots)
	Dimensions (WxHxD)	124.5 x 101.6 x 25.4 mm (4.9 x 4.0 x 1.0 in)
	Disc Formats	xD-Picture Micro SD Micro SDHC SD SDHC SDXC Mini SD Mini SDHC MultiMediaCard (MMC) Reduced Size MultiMediaCard (RS MMC) MultiMedia Card 4.2 (MMC Plus, including MMC Plus HC) Reduced Size MultiMedia Card 4.2 (MMC Mobile, including MMC Mobile HC) CompactFlash Card Type I CompactFlash Card Type II MicroDrive Memory Stick (MS) MagicGate Memory Stick (MG) MagicGate Memory Stick Duo Memory Stick Select Memory Stick Duo (MS Duo) Memory Stick PRO (MS PRO) Memory Stick PRO Duo (MS PRO Duo) Memory Stick PRO-HG Duo Two additional formats are usable with adapters (not supplied): MMC Micro Memory Stick Micro (M2)

Technical Specifications - Controller Cards

HP IEEE 1394b FireWire PCIe Card	Data Transfer Rate	Supports up to 800 Mbps
	Devices Supported	IEEE-1394 compliant devices
	Bus Type	PCIe card full height PCIe slots
	Ports	Two IEEE-1394b bilingual 9-Pin Connector (Rear)
	Internal Connectors	One 10-Pin header Custom Connector
	System Requirements	Windows 7 Professional 32-bit and 64-bit, Microsoft® Windows® XP Professional, Windows XP Home, Windows Vista. Not supported on Linux. Pentium® III or higher processor 128-MB RAM 1-GB Hard Drive CD-ROM drive Built in sound system Available PCI 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	Windows 7 Professional 32-bit and 64-bit, Windows Vista® Business 32-bit and 64-bit, Windows® XP Professional, XP Professional 64-bit. Not supported on Linux.

Technical Specifications - Networking and Communications

NOTE 1: "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

Broadcom (5761) NetXtreme Gigabit Ethernet Plus NIC		
	Connector	RJ-45
	Controller	Broadcom 5761 PCI-Express LAN Controller
	Memory	8 MB NVRAM serial Flash
	Data Rates Supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB, 802.3u, and 802.3x
	Bus Architecture	PCI-Express
	Data Path Width	Single Channel PCI-Express
	Data Transfer Mode	Bus Master DMA
	Hardware Certifications	FCC class B, Canada and US NRTL Mark, C-Tick for Australia, BSMI for Taiwan, VCCI for Japan, MIC for Korea, GOST for Russia, UL listed (E212044), European Union Notice (CE 0682)
	Power Requirement	1.8W @ 3.3V
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex Half-duplex (not available for the 1000BASE-T transceiver)
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating Temperature	32° to 131°F (0° to 55° C)
	Operating Humidity	131° F (55° C) with 5% to 95% non-condensing humidity
	Dimensions	7 cm x 10.5 cm (2.75 in x 4.13 in), low profile compatible
	Operating System Driver Support	Windows 7 Professional 32-bit and 64-bit, Windows Vista 32-bit SP1, Windows Vista x64 SP1, Windows XP 32 bit professional, Windows XP x64 Red Hat Enterprise Linux(RHEL) WS4*, 5, 6 Desktop/Workstation Novell SLED 10 & 11 *RHEL WS4 not supported on Z200/Z200SFF
	Management Capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility, ASF2.0, DASH 1.0 and DASH 1.1 profiles
	Kit Contents	Broadcom NetXtreme Gigabit Ethernet Plus NIC, Broadcom NetXtreme Gigabit Ethernet Plus NIC USB Cable Assembly, CD, drivers, quick install guide, product warranty statement

Technical Specifications - Networking and Communications

Intel Gigabit CT Desktop NIC		
	Connector	RJ-45
	Controller	Intel WG82574L Gigabit Ethernet Controller
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
	Data Rates Supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus Architecture	PCI-E 1.0a
	Data Path Width	X1, 250 MB/s, Bi-directional interface
	Data Transfer Mode	Bus-master DMA
	Hardware Certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power Requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T
	Boot ROM Support	Yes
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating Temperature	32° to 131°F (0° to 55° C)
	Operating Humidity	85% at 131° F (55° C)
	Dimensions	12.1 x 5.7 x 2.0 cm (4.75 x 2.25 x 0.8 in)
	Operating System Driver Support	Windows 7 Professional 32-bit and 64-bit, Windows Vista Business 64, Windows Vista Business 32, Windows XP Professional, Windows XP x64. Red Hat Enterprise Linux 4 (RHEL4.8 or newer)*, Red Hat Enterprise Linux 5 (RHEL5.3 or newer), Red Hat Enterprise Linux 6 * RHEL WS4 not supported on Z200/Z200SFF
	Management Capabilities	WOL , PXE, DMI, WFM 2.0
	Kit Contents	Intel Gigabit CT Desktop NIC, low profile bracket, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement

Technical Specifications - Networking and Communications

HP NC360T PCI Express Dual Port Gigabit NIC		
	Connector	Two RJ-45
	Controller	Intel 82571EB
	Memory	Integrated 96KB
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.3, 802.3u, 802.3x, 802.3ab, 802.3ad, 802.1p, 802.1Q
	Bus Architecture	PCI-E 1.0a
	Data Path Width	Four lane (x4) PCI Express compatible with x4, x8, and x16 PCI Express slots
	Data Transfer Mode	Bus-master DMA
	Hardware Certifications	FCC Class B, VCCI Class B, BSMI Class A, CISPR 22 Class B, EN 55022 Class B, EN55024-1, ICES-003 Class B, MIC Class B, ACA Class B, UL, Canada UL, EN60950
	Power Requirement	1280 mA @ 3.3V typical
	Boot ROM Support	Yes
	Network Transfer Rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
	Operating Temperature	32° to 131°F (0° to 55° C)
	Operating Humidity	0% to 95% non-condensing
	Dimensions	12.95 x 6.8 cm (5.1 x 2.7 in)
	Operating System Driver Support	Windows Vista Business 64, Windows Vista Business 32, Windows XP Professional, Windows XP Professional x64 Edition. Red Hat Enterprise Linux(RHEL) WS4, 5, 6 Desktop/Workstation Novell SLED 10 & SLED 11
	Management Capabilities	WOL , PXE 2.1
	Kit Contents	HP NC360T PCI Express Dual Port Gigabit NIC, low profile bracket, CD containing Intel PROset II NIC drivers, quick install guide, product warranty statement