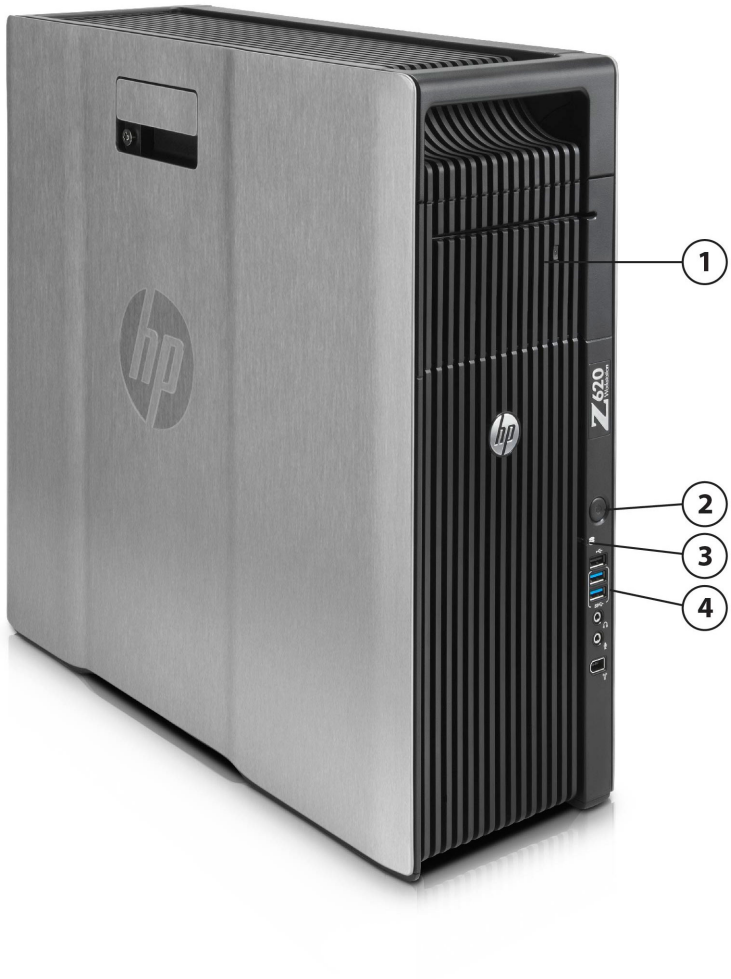
Overview



1. 2 External 5.25" Bays (shown with optional slot-load optical drive)
2. Power Button
3. HDD Activity LED
4. Front I/O: 1 USB 2.0, 2 USB 3.0, 1 Headphone, 1 Microphone, 1 1394a

Overview

5. 2 External 5.25" Bays
6. 3 Internal 3.5" Bays
7. 12 DIMM Slots for DDR3 ECC Memory
8. 800W, 90% Efficient Power Supply
9. Rear I/O: Rear Power Button & LED, PS/2 Ports, 1 1394a, 4 USB 2.0, 2 USB 3.0, 2 RJ-45 to Integrated GbE, 1 Audio Line In, 1 Audio Line Out, 1 Microphone
10. Intel Xeon Processors E5-1600 family or E5-2600 family
11. 2nd CPU & Memory Module
12. 2 PCIe x16 Gen3 Slots
13. 1 PCIe x8 Gen3, 1 PCIe x8(x4) Gen2, 1 PCIe x4(x1) Gen2, 1 PCI Slot
14. 6 Internal USB 2.0 Ports
15. 10 SATA Ports

Form Factor	Minitower
Operating Systems	Preinstalled: • Genuine Windows 7® Ultimate 64-bit* • Genuine Windows 7® Professional 64-bit*

Overview

- Genuine Windows 7® Professional 32-bit*
- HP Installer Kit for Linux (includes drivers for 64-bit OS versions of RHEL 5 & 6 and 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
- SUSE Linux Enterprise Desktop 11

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

Notes: *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.

Available Processors

Name	Cores	Clock Speed (GHz)	Cache (MB)	Memory Speed (MHz)	QPI Speed (GT/s)	Hyper-Threading	Featuring Intel® vPro™ Technology	Intel® Turbo Boost Technology[1]	TDP (W)
Intel® Xeon® E5-2690 processor	8	2.9	20	1600	8.0	Y	Y	4, 9	135
Intel Xeon E5-2680 processor	8	2.7	20	1600	8.0	Y	Y	4, 8	130
Intel Xeon E5-2670 processor	8	2.6	20	1600	8.0	Y	Y	4, 7	115
Intel Xeon E5-2667 processor	6	2.9	15	1600	8.0	Y	Y	3, 6	130
Intel Xeon E5-2665 processor	8	2.4	20	1600	8.0	Y	Y	4, 7	115
Intel Xeon E5-2660 processor	8	2.2	20	1600	8.0	Y	Y	5, 8	95
Intel Xeon E5-2650 processor	8	2.0	20	1600	8.0	Y	Y	4, 8	95
Intel Xeon E5-2643 processor	4	3.3	10	1600	8.0	Y	Y	1, 2	130
Intel Xeon E5-2640 processor	6	2.5	15	1333	7.2	Y	Y	3, 5	95
Intel Xeon E5-2630 processor	6	2.3	15	1333	7.2	Y	Y	3, 5	95
Intel Xeon E5-2620 processor	6	2.0	15	1333	7.2	Y	Y	3, 5	95
Intel Xeon E5-2609 processor	4	2.4	10	1066	6.4	N	Y	N/A	80
Intel Xeon E5-2603 processor	4	1.8	10	1066	6.4	N	Y	N/A	80
Intel® Xeon® E5-1660 processor	6	3.3	15	1600	-	Y	Y	3, 6	130
Intel Xeon E5-1650 processor	6	3.2	12	1600	-	Y	Y	3, 6	130

Overview

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

[1]The specifications shown in this column represent the following: (all core maximum turbo steps, one core maximum turbo steps). Turbo boost stepping occurs in 100MHz increments. Processors that do not have turbo functionality are denoted as N/A.

NOTE: Z620 systems configured with E5-1600 series processors may not add a 2nd processor. To support two processors, E5-2600 series processor must be chosen.

Available Processor 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. See: http://www.intel.com/products/processor_number/ for details

Multi-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 technologies.

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.

Additional Details

- Intel® Sandy Bridge Architecture
- Intel® C602 Chipset
- Intel® Xeon® processor E5-2600 product family
  Intel® Xeon® processor E5-1600 product family
  (Sandy Bridge, Socket R)
- Up to 8.0GT/s QPI support with two QPI links between processors
- 4-channel per processor 1066/1333/1600 MHz DDR3 memory* subsystem
- Up to 96 GB Memory capacity with up to 12 DIMM slots and 8 GB DIMMs
- PCI Express I/O and dual PCIe x16 Gen3 graphics support
- Dual Integrated Intel Gigabit LAN on Motherboard (LOM)
- 2 channels of Serial ATA (SATA) 6.0 Gb/s and 8 channels of SATA 3.0 Gb/s natively supported internally
- SATA RAID** 0, 1, 5, and 10 support standard on motherboard
- SAS RAID 0, 1, and 10 supported using the LSI 9212-4i 6Gb/s controller
- SATA optical drives
- High Definition integrated audio with internal speaker
- 800W 90% efficient power supply
- ENERGY STAR® qualification and energy-saving features available on selected configurations (Not supported by Linux)
- Protected by HP Services, including a 3 years parts, 3 years labor, and 3 years onsite service (3/3/3) standard warranty. Terms and conditions vary by country. Certain restrictions and exclusions apply.

*Each processor supports up to 4 channels of DDR3 memory. To realize full performance at least 1

Overview

	DIMM must be inserted into each channel. To get full 8 channel support, 2 processors MUST be installed. **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.
Form Factor	Rackable Minitower
Color	Brushed aluminum & black
I/O Expansion Slots	Slot 1 (top): PCI Express Gen2 x4(1)* Full-height, Half-length (not available when 2nd CPU/Memory Module is installed) Slot 2: PCI Express Gen3 x16 Full-height, Full-length (with extender) Slot 3: PCI Express Gen2 x8(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.
Mass Storage Bays (see Storage section for more details)	Total bays = 5
Internal Bays	3 internal 3.5" bays (with acoustic dampening rail assemblies pre-installed)
External Bays	2 external 5.25" bays (4th HDD occupies one external bay)
Front I/O	2 USB 3.0, 1 USB 2.0, 1 Headphone, 1 Microphone, 1 IEEE 1394a
Rear I/O	2 USB 3.0, 4 USB 2.0, 2 RJ-45 integrated Gigabit LAN, 2 PS/2, 1 Audio Line-In, 1 Audio Line-Out, 1 Microphone Serial supported with optional connector on PCI bracket cabled to system board connector
Internal USB	6 USB 2.0
Chassis Dimensions (H x W x D)	44.45 x 17.15 x 46.48 cm (17.5 x 6.75 x 18.3 in)

Overview

System Weight	Actual weight depends upon configuration Minimum config: 15.5 kg (34.2 lb) Typical config: 17.9 kg (39.4 lb) Maximum config: 22.6 kg (49.9 lb)	
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	Tool-free 800W 90% Efficient wide-ranging, active Power Factor Correction The Power Supply Efficiency Report for this product may be found at this link: TBD	
Interfaces Supported	10-channel SATA Interface (2 @ 6.0 Gb/s and 8 @ 3.0 Gb/s). 6 channels are eSATA configurable (2 @ 6 Gb/s, 4 @ 3 Gb/s) for use with eSATA CTO/AMO Kit. SAS interface supported USB 3.0, USB 2.0, IEEE 1394a interface	
Hard Drive Controllers Supported	SATA and SAS controllers	
Backup Devices	For a complete listing of compatible DAT tape drives, LTO tape drives and RDX Removable Disk Backup System offerings, please visit http://www.hp.com/go/connect	
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 E5-2603 4C 1.80GHz	Y	N		
Intel® Xeon® Processor E5-2609 4C 2.40GHz	Y	N		
Intel® Xeon® Processor E5-2620 6C 2.00GHz	Y	N		
Intel® Xeon® Processor E5-2630 6C 2.30GHz	Y	N		
Intel® Xeon® Processor E5-2640 6C 2.50GHz	Y	N		
Intel® Xeon® Processor E5-2643 4C 3.30GHz	Y	N		
Intel® Xeon® Processor E5-2650 8C 2.00GHz	Y	N		
Intel® Xeon® Processor E5-2660 8C 2.20GHz	Y	N		
Intel® Xeon® Processor E5-2665 8C 2.40GHz	Y	N		
Intel® Xeon® Processor E5-2667 6C 2.90GHz	Y	N		
Intel® Xeon® Processor E5-2670 8C 2.60GHz	Y	N		
Intel® Xeon® Processor E5-2680 8C 2.70GHz	Y	N		
Intel® Xeon® Processor E5-2690 8C 2.90GHz	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 E5-1620 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		
Intel Xeon E5-2600 Series - Z620 AMO				
Z620 Xeon E5-2603 4C 1.80 10MB 1066 CPU2	N	Y	A6S72AA	
Z620 Xeon E5-2609 4C 2.40 10MB 1066 CPU2	N	Y	A6S73AA	
Z620 Xeon E5-2620 6C 2.00 15MB 1333 CPU2	N	Y	A6S74AA	
Z620 Xeon E5-2630 6C 2.30 15MB 1333 CPU2	N	Y	A6S75AA	
Z620 Xeon E5-2640 6C 2.50 15MB 1333 CPU2	N	Y	A6S76AA	
Z620 Xeon E5-2643 4C 3.30 10MB 1600 CPU2	N	Y	A6S77AA	
Z620 Xeon E5-2650 8C 2.00 20MB 1600 CPU2	N	Y	A6S78AA	
Z620 Xeon E5-2660 8C 2.20 20MB 1600 CPU2	N	Y	A6S79AA	
Z620 Xeon E5-2665 8C 2.40 20MB 1600 CPU2	N	Y	A6S80AA	
Z620 Xeon E5-2667 6C 2.90 15MB 1600 CPU2	N	Y	A6S81AA	
Z620 Xeon E5-2670 8C 2.60 20MB 1600 CPU2	N	Y	A6S82AA	
Z620 Xeon E5-2680 8C 2.70 20MB 1600 CPU2	N	Y	A6S83AA	
Z620 Xeon E5-2690 8C 2.90 20MB 1600 CPU2	N	Y	A6S84AA	

NOTE 1: 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. See: http://www.intel.com/products/processor_number/ for details.

Supported Components

Multi-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 technologies.

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.

Intel's numbering is not a measurement of higher performance.
Z620 processor AMO kits include:
- 2nd CPU/Memory Module (riser)
- processor
- heat sink

		Factory Configured	Option Kit	Option Kit Part Number	Support Notes
SAS Hard Drives	HP SAS (Serial Attached SCSI) Hard Drives for HP Workstations				
	HP 300GB SAS 10K SFF HDD	Y	Y	A2Z20AA	
	HP 600GB SAS 10K SFF HDD	Y	Y	A2Z21AA	
	300GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	LU967AA	
	450GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	LU968AA	
	600GB SAS 15K rpm 6Gb/s 3.5" HDD	Y	Y	VM647AA	
	Sub-Section Description/Notes				
	NOTE: SAS Controller add-in card required				
SATA Hard Drives	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	
	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	
SATA Solid State Drives	HP Solid State Drives (SSDs) for Workstations				
	HP 128GB SATA SSD	Y	Y	A3D25AA	
	HP 256GB SATA SSD	Y	Y	A3D26AA	
	HP 160GB SATA SSD	Y	Y	LZ704AA	
	HP 300GB SATA SSD	Y	Y	LZ069AA	

For hard drives, 1 GB = 1 billion bytes; TB = 1 trillion bytes. Actual formatted capacity is less. Up to 12 GB of hard drive (or system disk) is reserved for the system recovery software (XP and XP Pro). Up to 3 GB of system disk is reserved for system recovery software (Vista).
Up to 4 drives are allowed. The 4th drive will occupy one of the external 5.25" bays.

Supported Components

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 1 Configuration - Mirrored Array	Y	N		See note 1
RAID 10 Configuration - Striped/Mirrored Array	Y	N		See note 1
RAID 0 Data Configuration -- Boot/OS Drive + 2 Drive Striped 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	
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	
Optional: LSI iBBU08 Battery Backup Unit for LSI 9260-8i	N	Y	LA783AA	

All RAID arrays must be less than 2 TB in size

NOTE 1: Requires 2 identical hard drives (speeds, capacity, interface). RAID 1 does not support a 3rd HDD. No Linux support for SATA RAID.

NOTE: Specific user-configured hardware SAS RAID configurations are supported on this system with Linux. Please visit: http://www.hp.com/support/linux_hardware_matrix for details.

LSI RAID Definitions:
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.
IS: Striping of 2 or more HDDs into a single logical volume
IM: Mirroring of 2 HDDs into a single logical volume
IME: Mirroring of 3 or more HDDs into a single logical volume

NOTE: 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

Supported Components

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		4
NVIDIA NVS300 512MB PCIe Graphics Card	Y	Y	XP612AA		4
NVIDIA NVS 310 512MB Graphics Card	Y	Y	A7U59AA		3
NVIDIA Quadro NVS 450 512 MB PCIe Graphics Card	Y	Y	FH519AA	2nd card must be NVS 450 or NVS 310	2 X
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		2
NVIDIA Quadro 4000 2GB Graphics Card	Y	Y	WS095AA		2
NVIDIA Quadro 5000 2.5GB Graphics Card	Y	Y	WS096AA		2
NVIDIA Quadro 6000 6GB Graphics Card	Y	Y	WS097AA		2

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.

Supported Components

Memory	CTO	Option Kit Part Number	Support Notes
	DDR3-1600 ECC Unbuffered DIMMs - CTO		
	2GB DDR3-1600 ECC Unbuffered RAM		
	4GB DDR3-1600 ECC Unbuffered RAM		
	DDR3-1600 ECC Registered DIMMs - CTO		
	4GB DDR3-1600 ECC Registered RAM		
	8GB DDR3-1600 ECC Registered RAM		
	Sub-Section Description/Notes		
	The Z620 has a four-channel memory architecture. Four channels are associated with each processor. For optimal performance, populate a DIMM in each channel.		
	AMO		
	DDR3-1600 ECC Registered DIMMs - AMO		
	4GB DDR3-1600 ECC Registered RAM	A2Z49AA	
	8GB DDR3-1600 ECC Registered RAM	A2Z51AA	
	DDR3-1600 ECC Unbuffered DIMMs - AMO		
	HP 2GB (1x2GB) DDR3-1600 ECC RAM	A2Z47AA	
	HP 4GB (1x4GB) DDR3-1600 ECC RAM	A2Z48AA	
	NOTE: Although all of these memory selections incorporate 1600MHz memory modules, the speed at which they operate is dependent upon the processor.		

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	

Optical and Removable Storage	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP 16X DVD-ROM SATA Drive (non-Lightscribe version)	Y	Y	AR629AA	See note 1
HP 16X DVD+/-RW SuperMulti SATA Drive (non-Lightscribe)	Y	Y	QS208AA	
HP Slot Load DVD+/-RW Drive	Y	N		
HP Blu-ray Writer	Y	Y	AR482AA	See note 2
HP 22-in-1 Media Card Reader Kit (Workstations)	Y	Y	NK361AA	
HP DX115 Removable Drive Enclosure				
HP DX115 Carrier with 160GB SATA HDD	N	Y	FZ577AA	
HP DX115 Removable HDD Frame/Carrier	N	Y	FZ576AA	
HP DX115 Removable HDD Carrier	N	Y	NB792AA	
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 Optical Drive.
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
Integrated Intel 82579LM PCIe GbE Controller	Y	N		See note 2
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

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.

Racking and Physical Security

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
Security Cable with Kensington Lock	N	Y	PC766A	
HP (CMT) Solenoid Lock	N	Y	DE618A	
HP Solenoid Hood Lock & Hood Sensor	Y	N		
HP Z6/Z8 Adjustable Sliding Rail Rack Kit	N	Y	NN124AA	

Supported Components

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	Y	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	EF390AA	

Other Hardware

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Workstation Mouse Pad	Y	N		Japan only.
HP Power Cord Kit	N	Y	DM293A	
HP eSATA PCI Cable Kit	N	Y	GM110AA	
HP Serial Port Adapter	N	Y	PA716A	
HP Internal USB Port Kit	N	Y	EM165AA	
HP Optical Bay HDD Mounting Bracket	Y	Y	NQ099AA	For 3.5" HDDs
HP Energy Star Enabled Configuration	Y	N		

Software

	Factory Configured	Option Kit	Option Kit Part Number	Support Notes
HP Performance Advisor	Y	Y		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 64-bit	See Note 1
Genuine Windows® 7 Professional 32-bit	See Note 1
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 Intaller Kit as the first OS.

System Board	
System Board Form Factor	Main System Board: 24 x 31 cm 9.6 x 12.2 inches 2nd CPU/Memory Board (optional): 14.9 x 29.2 cm 5.85 x 11.50 inches
Processor Socket	LGA2011 1st CPU on system board 2nd CPU on optional 2nd CPU/Memory Module
CPU Bus Speed	QPI: Up to 8.0GT/second, depending on processor
Chipset	Intel C602 Chipset
Super I/O Controller	Nuvoton NPCD379H (SIO-12)
Memory Expansion Slots	8 on system board(CPU0) + 4 on optional 2nd CPU/Memory Module (CPU1)
Memory Type Supported	DDR3, UDIMM (Unbuffered), ECC: 2GB and 4GB DDR3, RDIMM (Registered), ECC: 4GB and 8GB
Memory Modes	NUMA (Non-Uniform Memory Architecture), Memory Node Interleave
Memory Speed Supported	1066, 1333, & 1600MHz

		Single Processor							
		CPU0 Front Slots				CPU0 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
12	UDIMM	2GB	2GB	2GB			2GB	2GB	2GB
16	UDIMM	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB
16	UDIMM	4GB		4GB			4GB		4GB
16	RDIMM	4GB		4GB			4GB		4GB
24	UDIMM	4GB	2GB	4GB	2GB	2GB	4GB	2GB	4GB
32	UDIMM	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
32	RDIMM	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
32	RDIMM	8GB		8GB			8GB		8GB
48	RDIMM	8GB	4GB	8GB	4GB	4GB	8GB	4GB	8GB
64	RDIMM	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB
Slot Load Order		1	5	3	7	8	4	6	2

		Dual Processor											
		CPU0 Front Slots				CPU0 Rear Slots				CPU1 Front Slots		CPU1 Rear Slots	
Capacity (GB)	Type	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7	DIMM 8	DIMM 1	DIMM 2	DIMM 3	DIMM 4
4	UDIMM	2GB								2GB			
8	UDIMM	2GB							2GB	2GB			2GB
12	UDIMM	2GB		2GB					2GB	2GB	2GB		2GB
16	UDIMM	2GB		2GB			2GB		2GB	2GB	2GB	2GB	2GB
20	UDIMM	2GB	2GB	2GB			2GB	2GB	2GB	2GB	2GB	2GB	2GB
24	UDIMM	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB	2GB
32	UDIMM	4GB		4GB			4GB		4GB	4GB	4GB	4GB	4GB
32	RDIMM	4GB		4GB			4GB		4GB	4GB	4GB	4GB	4GB
48	UDIMM	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB	4GB
48	RDIMM	8GB		4GB			4GB		8GB	8GB	4GB	4GB	8GB
64	RDIMM	8GB		8GB			8GB		8GB	8GB	8GB	8GB	8GB
80	RDIMM	8GB	4GB	8GB	4GB	4GB	8GB	4GB	8GB	8GB	8GB	8GB	8GB
96	RDIMM	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB	8GB
Slot Load Order		1	9	5	11	12	7	10	3	2	6	8	4

NOTE: CPU0 is located on the main system board. CPU1 (optional) is located on an add-in riser card.

Maximum Memory	Supports up to 96GB
Memory Configuration (Supported)	• Not all memory configurations possible are represented above. • Only ECC DIMMs are supported. • Do not install memory modules into memory slots if corresponding processor is not installed. • Dual processor configurations with memory modules installed for only one processor is not supported. • UDIMM (Unbuffered) and RDIMM (Registered) memory cannot be mixed. All memory installed in the system must be either UDIMM or RDIMM.
PCI Express Connectors	Slot 1 (top): PCI Express Gen2 x4(1)* Full-height, Half-length (not available when 2nd CPU/Memory Module is installed) Slot 2: PCI Express Gen3 x16 Full-height, Full-length (with extender) Slot 3: PCI Express Gen2 x8(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) * 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.	
PCI Connectors (5.0V)	Slot 6: PCI 32bit/33MHz Full-height, Full-length (with extender)	
Supported Drive Interfaces	SATA	Integrated 10-channel SATA interface (2@6Gb/s, 8@3Gb/s). Supports RAID 0, 1, 5, 10 and NCQ. Factory integrated RAID is Microsoft Windows only.
	Serial Attached SCSI	Requires Optional PCIe card
Integrated RAID	• Integrated SATA RAID • RAID 0, RAID 1*, RAID 5, RAID 10 • Supports one RAID array with 2-4 drives • RAID 0 configuration - striped array (supported and configure to order) • RAID 1 configuration - mirrored array (supported and configure to order) • RAID 5 parity striping (supported but not configure to order) • RAID 10 striped and mirrored array (supported but not configure to order) *HW RAID functionality not supported by Linux. Use SW RAID functionality provided in the Red Hat Operating system instead.	
Integrated Graphics	No	
Network Controller	• Integrated Intel 82579 and 82574 Controllers. • Memory Integrated 48KB receive buffer and 8KB transmit buffer • Data rates supported 10/100/1000 Mb/s • Compliance IEEE 802.3, 802.3AB and 802.3u compliant, 802.3x flow control • Bus architecture PCIe 1.0a • Data path width X1 • Data path speed 2.5Gbit per sec per direction transfer rate • Data transfer mode Bus-master DMA • Power requirement 1.0 watts @ +3.3V AUX supply • Boot ROM support Yes • Network transfer rate 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 • Microsoft Windows Vista Business 32 and 64, Microsoft Windows XP Professional 32 and 64 • Management capabilities AMT/vPro Technology	

System Technical Specifications

SATA Connectors	10 ports/connectors (6 ports may be cabled to optional eSATA cable kits [2 ports per cable kit])	
IEEE 1394a or 1394b	1394a is integrated 1394b is optional with PCIe card Cable from Front IO can be plugged into PCIe Card. Not supported in Linux	
IEEE 1394 Connector(s)	Front	1 - 1394a
	Rear	1 - 1394a
	Internal	No
USB Connector(s)	Front	1 - USB 2.0 2 - USB 3.0
	Rear	4 - USB 2.0 2 - USB 3.0
	Internal	6 - USB 2.0 (3x 2x5 headers) Provides connection for optional HP Internal USB Port Kits and Media Card Reader
HD Integrated Audio	Realtek ALC262	
Flash ROM	Yes	
CPU Fan Header	One for each CPU socket	
Chassis Fan Header	Rear System Chassis Fan Header Front System Chassis Fan Header	
CMOS Battery Holder – Lithium	Yes	
Integrated Trusted Platform Module	TPM 1.2, Infineon	
Power Supply Headers	Yes	
Power Switch, Power LED & Hard Drive LED Header	Yes (includes speaker and intrusion sensor signals)	
Clear Password Jumper	Yes	
Serial Port	Optional	
Parallel Port	No	
Keyboard/Mouse	PS/2	

Z620 Required Power Supply Info		
Power Supply	800W 90% Efficient, Custom PSU (Wide Ranging, Active PFC)	
Operating Voltage Range	90–269 VAC	
Rated Voltage Range	100–240 V	118 V
Rated Line Frequency	50–60 Hz	400 Hz
Operating Line Frequency Range	47–66 Hz	393–407 Hz
Rated Input Current	9.7 A @ 100-240 V	9.7 A @ 400 V
Heat Dissipation (Configuration and software dependent)	Typical = 1972 btu/hr (497kg-cal/hr) Maximum = 3139 btu/hr (791 kg-cal/hr)	
Power Supply Fan	92x25 mm variable speed	
ENERGY STAR Qualified (Configuration dependent)	Yes	
80 PLUS® Compliant	Yes, 90% Efficient The Z620 800W 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	
CECP Compliant @ 220V (<4W in S3 - Suspend to RAM)	Yes; Configuration dependent	
Power Consumption in sleep mode (as defined by ENERGY STAR) - Suspend to RAM (S3) (Instantly Available PC) measured at 115V.	<15W	
Built-in Selft Test LED	Yes	
Surge Tolerant Full Ranging Power Supply (withstands power surges up to 2000V	Yes	

Access Panel Solenoid Lock Header	Yes
Access Panel Intrusion Sensor Header	Yes Integrated in Front User Interface (Power Switch, Power LED, HDD LED, Speaker) Cable
Multibay Header	No
Integrated Gigabit Ethernet	Integrated Intel 82579 and 82574 Controllers
Wake on LAN	Yes
ASF 1.0/2.0 (Alert Standard Format)	No
TPM	Integrated TPM 1.2; Infineon
Password Clear Header	Yes
AUX IN (audio)	No
Clear CMOS Button	Yes
Memory Fan Header	CPU0 Memory Fan Header; CPU1 Memory Fan Header

System Configuration

System Technical Specifications

Example Configuration #1 (ENERGY STAR QUALIFIED)	*Processor Info* Memory Info Graphics Info Disks/Optical/Floppy Power Supply Other	1x Intel Xeon E5-2650 (Eight-Core) 4x 2GB DDR3 1600 (UDIMM) 1x NVIDIA Quadro 600 1x 250GB SATA 7200/1x 16X DVD-ROM SATA 800W 90% Custom PSU 1x NVIDIA Tesla C2075					
Energy Consumption		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	111 W		110 W		111 W	
	Windows Busy Typ (S0)	287 W		276 W		286 W	
	Windows Busy Max (S0)	396 W		390 W		398 W	
	Sleep (S3)	4.25 W	4.10 W	4.43 W	4.31 W	4.25 W	4.11 W
	Off (S5)	1.81 W	1.62 W	2.07 W	1.89 W	1.79 W	1.61 W
	Zero Power Mode (ErP)	0.25 W		0.45 W		0.23 W	
Heat Dissipation**		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	379 btu/hr		375 btu/hr		379 btu/hr	
	Windows Busy Typ (S0)	979 btu/hr		942 btu/hr		976 btu/hr	
	Windows Busy Max (S0)	1351 btu/hr		1331 btu/hr		1358 btu/hr	
	Sleep (S3)	14.5 btu/hr	14.0 btu/hr	15.1 btu/hr	14.7 btu/hr	14.5 btu/hr	14.0 btu/hr
	Off (S5)	6.18 btu/hr	5.53 btu/hr	7.06 btu/hr	6.45 btu/hr	6.11 btu/hr	5.49 btu/hr
	Zero Power Mode (ErP)	0.85 btu/hr		1.54 btu/hr		0.78 btu/hr	

Example Configuration #2 (ENERGY STAR QUALIFIED)	*Processor Info* Memory Info Graphics Info Disks/Optical/Floppy Power Supply Other	1x Intel Xeon E5-2643 (Four-Core) 4x 4GB DDR3 1600 (UDIMM) 1x NVIDIA NVS 300 2x 500GB SATA 7200/1x 16X DVD-ROM SATA 800W 90% Custom PSU -					
Energy Consumption		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	66.8 W		66.3 W		66.9 W	
	Windows Busy Typ (S0)	170 W		169 W		171 W	
	Windows Busy Max (S0)	193 W		190 W		193 W	
	Sleep (S3)	4.43 W	4.31 W	4.62 W	4.51 W	4.43 W	4.33 W
	Off (S5)	1.81 W	1.38 W	2.07 W	1.64 W	1.78 W	1.36 W
	Zero Power Mode (ErP)	0.24 W		0.45 W		0.23 W	
Heat Dissipation**		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	228 btu/hr		226 btu/hr		228 btu/hr	
	Windows Busy Typ (S0)	580 btu/hr		577 btu/hr		583 btu/hr	
	Windows Busy Max (S0)	659 btu/hr		648 btu/hr		659 btu/hr	
	Sleep (S3)	15.1 btu/hr	14.7 btu/hr	15.8 btu/hr	15.4 btu/hr	15.1 btu/hr	14.8 btu/hr
	Off (S5)	6.18 btu/hr	4.71 btu/hr	7.06 btu/hr	5.60 btu/hr	6.07 btu/hr	4.64 btu/hr
	Zero Power Mode (ErP)	0.82 btu/hr		1.54 btu/hr		0.78 btu/hr	

System Technical Specifications

Example Configuration #3 (ENERGY STAR QUALIFIED)	*Processor Info*	2x Intel Xeon E5-2690 (Eight-Core)					
	Memory Info	8x 8GB DDR3 1600 (RDIMM)					
	Graphics Info	1x NVIDIA Quadro 2000					
	Disks/Optical/Floppy	2x 250GB SATA 7200/1x 16X DVD+-RW SuperMulti SATA					
	Power Supply	800W 90% Custom PSU					
	Other	-					
Energy Consumption		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	121 W		120 W		122 W	
	Windows Busy Typ (S0)	506 W		494 W		518 W	
	Windows Busy Max (S0)	541 W		531 W		544 W	
	Sleep (S3)	7.75 W	7.57 W	7.84 W	7.67 W	7.82 W	7.62 W
	Off (S5)	1.97 W	1.57 W	2.18 W	1.82 W	1.96 W	1.55 W
	Zero Power Mode (ErP)	0.24 W		0.44 W		0.23 W	
Heat Dissipation**		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	413 btu/hr		409 btu/hr		416 btu/hr	
	Windows Busy Typ (S0)	1727 btu/hr		1686 btu/hr		1767 btu/hr	
	Windows Busy Max (S0)	1846 btu/hr		1812 btu/hr		1856 btu/hr	
	Sleep (S3)	26.4 btu/hr	25.8 btu/hr	26.8 btu/hr	26.2 btu/hr	26.7 btu/hr	26.0 btu/hr
	Off (S5)	6.72 btu/hr	5.36 btu/hr	7.44 btu/hr	6.21 btu/hr	6.69 btu/hr	5.29 btu/hr
	Zero Power Mode (ErP)	0.82 btu/hr		1.50 btu/hr		0.78 btu/hr	

Example Configuration #4	*Processor Info*	2x Intel Xeon E5-2620 (Six-Core)					
	Memory Info	12x 4GB DDR3 1600 (UDIMM)					
	Graphics Info	2x NVIDIA Quadro 5000					
	Disks/Optical/Floppy	4x 600GB SAS 15K/1x 16X DVD+-RW SuperMulti SATA					
	Power Supply	800W 90% Custom PSU					
	Other	LSI 9212 SAS Card					
Energy Consumption		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	216 W		213 W		217 W	
	Windows Busy Typ (S0)	525 W		485 W		512 W	
	Windows Busy Max (S0)	644 W		631 W		647 W	
	Sleep (S3)	9.27 W	8.81 W	9.36 W	8.91 W	9.31 W	8.89 W
	Off (S5)	1.85 W	1.43 W	2.12 W	1.68 W	1.83 W	1.41 W
	Zero Power Mode (ErP)	0.25 W		0.45 W		0.23 W	
Heat Dissipation**		115 VAC		230 VAC		100 VAC	
		LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled	LAN Enabled	LAN Disabled
	Windows Idle (S0)	737 btu/hr		727 btu/hr		740 btu/hr	
	Windows Busy Typ (S0)	1791 btu/hr		1655 btu/hr		1747 btu/hr	
	Windows Busy Max (S0)	2197 btu/hr		2153 btu/hr		2208 btu/hr	
	Sleep (S3)	31.6 btu/hr	30.1 btu/hr	31.9 btu/hr	30.4 btu/hr	31.8 btu/hr	30.3 btu/hr
	Off (S5)	6.31 btu/hr	4.88 btu/hr	7.23 btu/hr	5.73 btu/hr	6.24 btu/hr	4.81 btu/hr
	Zero Power Mode (ErP)	0.85 btu/hr		1.54 btu/hr		0.78 btu/hr	

System Technical Specifications

Declared Noise Emissions (Entry-level and High-end configurations)		
System Configuration (Entry level)	Processor Info	Single Intel Xeon E5-2640 2.50 GHz
	Memory Info	4 - 2 GB DDR3 1333 MHz UDIMM
	Graphics Info	NVIDIA Q400
	Disks/Optical/Floppy	Single 1 TB 7200 RPM SATA DVD ROM

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	3.3	16
	Hard drive Operating (random reads)	3.9	22
	DVD-ROM Operating (sequential reads)	5.1	39

System Configuration (High-end)	Processor Info	Dual Xeon E5-2690 2.90 GHz
	Memory Info	12 - 4GB DDR3 1600 MHz UDIMM
	Graphics Info	NVIDIA Q4000
	Disks/Optical/Floppy	Dual 600 GB 15K RPM SAS 3.5" DVD ROM

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)		Sound Power (LWAd, bels)	Deskside Sound Pressure (LpAm, decibels)
	Idle	4.4	29
	Hard drive Operating (random reads)	4.8	32
	DVD-ROM Operating (sequential reads)	5.1	36

System Technical Specifications

Environmental Requirements	Temperature	Operating: 5°C to 35°C (40°F to 95°F) Non-operating: -40°C to 60°C (-40°F 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 ft) Non-operating: 9,144 m (30,000 ft)
	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 1524m (5,000 ft) altitude, maximum operating temperature is de-rated by 1°C (1.8°F) per 305m (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
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.

System Technical Specifications

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
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	No
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
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	SPI ROM
Diagnostic Power Switch LED on board	Yes
Clear Password Jumper	Yes
Clear CMOS Button	Yes
CMOS Battery Holder	Yes
DIMM Connectors	Yes
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.

System Technical 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
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

System Technical Specifications

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 memor
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 0.7
PCI Express	PCI Express Base Specification, Revision 2.0 PCI Express Base Specification, Revision 3.0
PMM	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 1.2
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

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 (Configuration dependent, Microsoft 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.'

System Technical Specifications

Batteries	This product complies with ISO standards: • EU Directive 91/ 157/ EEC • EU Directive 93/ 86/ EEC • EU Directive 98/ 101/ EEC Batteries used in the product do not contain: • Mercury greater than 5ppm by weight • Cadmium greater than 10ppm by weight • Lead greater than 4,000ppm by weight. Battery size: CR2032 (coin cell) Battery type: Lithium
Restricted Material Usage	This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html): • Asbestos • Batteries – Mercury • Batteries – Cadmium • Batteries – Lead (non-rechargeable) • Batteries – Non-rechargeable Alkaline and Carbon-Zinc Batteries • Batteries – Classification as "Not Restricted" for Transport • Brominated Flame Retardants (PBBs, PBDEs, including DecaBDE) • Brominated Flame Retardants (all BFRs in external case plastic parts) • Cadmium and its compounds • Certain Azo Colorants • Chlorinated Hydrocarbons • Chlorinated Paraffins • Formaldehyde • Formaldehyde – emissions • Hexavalent Chromium and its compounds in metallic applications • Hexavalent Chromium and its compounds in non-metallic applications • Lead and its compounds • Lead in paint • Lead in Polyvinyl Chloride (PVC) coating of external cables, wires and cords • Mercury and its compounds • Nickel on external surfaces • Ozone Depleting Substances (ODS) • Polycyclic Aromatic Hydrocarbons (PAH) • Perfluorooctane sulfonates (PFOS) in parts • Perfluorooctane sulfonates (PFOS) in preparations • Polychlorinated Biphenyls (PCBs) and Polychlorinated Terphenyls (PCTs) • Polychlorinated Naphthalenes • Polyvinyl Chloride (PVC) in external case plastic parts • Radioactive Substances • Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

BFR/PVC-Free Statement	Configurations of the HP Z620 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: Global Citizenship Report: http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications: http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html
Additional Information	• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC. • This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive - 2002/96/EC. • Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043. • This product contains 0% recycled materials (by wt.) • This product is >90% recycle-able when properly disposed of at end of life.
Packaging	HP Workstation product packaging meets the following (refer to the HP General Specification for the Environment (http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/gse.pdf) • 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: 0.5 kg
External	Cardboard carton and insert: 1.5 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 • PC Alarm Clock • Microsoft NAP Support • Host Base set-up and configuration • Management Engine (ME) firmware roll back
Intel® vPro™ Technology	The HP Z620 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 C602 chipset • Intel 82579LM GbE LAN
Remote Manageability Software Solutions	The HP Z620 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 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.

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
	A2A06AV	Intel Xeon E5-2620 2 15M 1333 6C 1 CPU
	A2A19AV	Intel Xeon E5-2620 2 15M 1333 6C 2 CPU
	A2A09AV	Intel Xeon E5-2643 3.3 10M 1600 4C 1 CPU
	A2A22AV	Intel Xeon E5-2643 3.3 10M 1600 4C 2 CPU

Hard Drives	Product #	Offering
	QG001AV	500GB 7200 RPM SATA 1st HDD
	QG011AV	500GB 7200 RPM SATA 2nd HDD
	QG021AV	500GB 7200 RPM SATA 3rd HDD
	QG031AV	500GB 7200 RPM SATA 4th HDD
	QG002AV	1TB 7200 RPM SATA 1st HDD
	QG012AV	1TB 7200 RPM SATA 2nd HDD
	QG022AV	1TB 7200 RPM SATA 3rd HDD
	QG032AV	1TB 7200 RPM SATA 4th HDD

Graphics	Product #	Offering
	A7U49AV	NVIDIA NVS 310 512MB GFX
	A7U50AV	NVIDIA NVS 310 512MB 2nd GFX
	A7U51AV	NVIDIA NVS 310 512MB 3rd GFX
	A7U52AV	NVIDIA NVS 310 512MB 4th GFX

Memory	Product #	Offering
		Any configuration with 2GB DDR3-1600 ECC Unbuffered DIMMs
		Any configuration with 4GB DDR3-1600 ECC Unbuffered DIMMs
		Any configuration with 4GB DDR3-1600 ECC Registered DIMMs
		Any configuration with 8GB DDR3-1600 ECC Registered DIMMs

Optical and Removable Storage	Product #	Offering
	QG049AV	16X SuperMulti DVDRW SATA 1st ODD
	QG053AV	16x SuperMulti DVDRW SATA 2nd ODD

Input Devices	Product #	Offering
	A8Z53AV	HP USB Keyboard (available June 2012)
	A8Z55AV	HP USB Optical Mouse (available June 2012)

Operating Systems	Product #	Offering
	LJ454AV	Windows 7 Professional 64-bit OS

Processors	Intel® Xeon® Processor E5-2603 4C 1.80GHz
	Intel® Xeon® Processor E5-2609 4C 2.40GHz
	Intel® Xeon® Processor E5-2620 6C 2.00GHz
	Intel® Xeon® Processor E5-2630 6C 2.30GHz
	Intel® Xeon® Processor E5-2640 6C 2.50GHz
	Intel® Xeon® Processor E5-2643 4C 3.30GHz
	Intel® Xeon® Processor E5-2650 8C 2.00GHz
	Intel® Xeon® Processor E5-2660 8C 2.20GHz
	Intel® Xeon® Processor E5-2665 8C 2.40GHz
	Intel® Xeon® Processor E5-2667 6C 2.90GHz
	Intel® Xeon® Processor E5-2670 8C 2.60GHz
	Intel® Xeon® Processor E5-2680 8C 2.70GHz
	Intel® Xeon® Processor E5-2690 8C 2.90GHz
	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

Processor Note

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

Z620 Xeon E5-2603 4C 1.80 10MB 1066 CPU2	A6S72AA
Z620 Xeon E5-2609 4C 2.40 10MB 1066 CPU2	A6S73AA
Z620 Xeon E5-2620 6C 2.00 15MB 1333 CPU2	A6S74AA
Z620 Xeon E5-2630 6C 2.30 15MB 1333 CPU2	A6S75AA
Z620 Xeon E5-2640 6C 2.50 15MB 1333 CPU2	A6S76AA
Z620 Xeon E5-2643 4C 3.30 10MB 1600 CPU2	A6S77AA
Z620 Xeon E5-2650 8C 2.00 20MB 1600 CPU2	A6S78AA
Z620 Xeon E5-2660 8C 2.20 20MB 1600 CPU2	A6S79AA
Z620 Xeon E5-2665 8C 2.40 20MB 1600 CPU2	A6S80AA
Z620 Xeon E5-2667 6C 2.90 15MB 1600 CPU2	A6S81AA
Z620 Xeon E5-2670 8C 2.60 20MB 1600 CPU2	A6S82AA
Z620 Xeon E5-2680 8C 2.70 20MB 1600 CPU2	A6S83AA
Z620 Xeon E5-2690 8C 2.90 20MB 1600 CPU2	A6S84AA

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

		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	

	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)	
2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD	Capacity	2.0TB	
	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), NCQ Enabled	
	Synchronous Transfer Rate (Maximum)	Up to 600 MB/s	
	Buffer	64MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	1.0 ms
		Average	11 ms
		Full Stroke	18 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	3,907,029,168	
	Operating Temperature	41° to 131° F (5° to 55° 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	
	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)	

Technical Specifications - Hard Drives

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)	

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	LSISAS2004	
	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.

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)

	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 NVS 310 512MB Graphics Card	Form Factor	Low Profile: 2.713 inches in height × 6.150 inches in length
	Graphics Controller	NVIDIA NVS 310
	Bus Type	PCI Express x16, 2.0 compliant
	Memory	Size: 512MB DDR3 Clock: 875Mhz Memory Bandwidth: 14GB/s
	Connectors	2 x DisplayPort 1.2
	Maximum Resolution	Up to 2560 x 1600 (digital display) per display.
	Image Quality Features	See Display Output section. The following video formats are supported: - MPEG2 - MPEG4 Part 2 Advanced Simple Profile - H.264 SVC codec support - Support for 3D Blu Ray - VC1 - DivX version 3.11 and later - MVC A full range of video resolutions are supported including 1080p, 1080i, 720p, 480p and 480i. The NVS 310 GPU provides hardware acceleration for the computationally intensive parts of video processing, as well as provides improved video playback speeds via faster decode and transcode.
	Display Output	Up to 2 displays in the following configurations: DisplayPort output: • Drives two DisplayPort enabled digital display at resolutions up to 2560 × 1600 at 60 Hz with reduced blanking, when connected natively using the 2 DisplayPort connectors on the NVS 310 graphics card • Supports 2 monitors up to resolution of 1920 × 1200 at 60 Hz with

	reduced blanking using DisplayPort 1.2 multi stream topology technology. DVI-D output: • Drives two digital display at resolutions up to 1920 × 1200 at 60 Hz with reduced blanking using DisplayPort to DVI-D single-link cable adaptors • Drives two digital display at resolutions up to 2560× 1600 at 60 Hz with reduced blanking using DisplayPort to DVI-D dual-link cable adaptors HDMI output: • NVS 310 is capable of driving two high definition (HD) panels up to resolutions of 1920 × 1080P at 60 Hz using DisplayPort to HDMI cable adaptors VGA display output: • Drives two analog display at resolutions up to 1920 × 1200 at 60 Hz using DisplayPort to VGA cable adaptors
Shading Architecture	Shader Model 5.0
Supported Graphics APIs	DX11, OpenGL 4.1
Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or the latest HP qualified drivers are 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	19.5 Watts
Note	The thermal solution used on this card is an active fan heatsink.

Technical Specifications - Graphics

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

NVIDIA Quadro 410 512MB Graphics	Form Factor	Low Profile: 2.713 inches × 5.7 inches, single slot
	Graphics Controller	NVIDIA Quadro 410
	Bus Type	PCI Express x16, 3.0 compliant
	Memory	Size: 512MB DDR3 Clock: 900MHz Memory Bandwidth: 14GB/s
	Connectors	One dual-link DVI-I connector One DisplayPort connector
	Maximum Resolution	Up to 2560 x 1600 (digital display) per display.
	RAMDAC	400 MHz integrated RAMDAC
	Display Output	Maximum resolution over DisplayPort: 2560 × 1600 × 32 bpp at 60 Hz (reduced blanking) Maximum resolution over DVI port: 2560 × 1600 × 32 bpp at 60 Hz (reduced blanking) Maximum resolution over VGA (through DVI to VGA cable): 2048 × 1536 × 32 bpp at 85 Hz

Technical Specifications - Graphics

	Shading Architecture	Shader Model 5.0
	Supported Graphics APIs	DX11, OpenGL 4.2
	Available Graphics Drivers	Genuine Windows 7 Professional (64-bit and 32-bit) Microsoft Windows XP Professional (64-bit and 32-bit) Red Hat Enterprise Linux(RHEL) SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or the latest HP qualified drivers are 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
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) 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

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) Red Hat Enterprise Linux(RHEL) 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
	Power Consumption	<50W
	Note	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.

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 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) Red Hat Enterprise Linux(RHEL) SUSE Linux Enterprise Desktop 11 (64-bit and 32-bit) HP qualified drivers may be preloaded or the latest HP qualified drivers are available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html
	Power Consumption	<75W
	Note	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.
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

		• 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) 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 One DP to DVI adapter included with card
	Maximum Resolution	2560 x 1600
	Display Output	Up to 3 simultaneous displays (using AMD Eyefinity with Windows 7 or Linux)
	Shading Architecture	Shader Model 5.0
	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) Red Hat Enterprise Linux(RHEL) 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
	Power Consumption	< 75W
	Note	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.
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 Two DP to DVI adapters included with card
	Maximum Resolution	2560 x1600
	Display Output	Up to 4 simultaneous displays (using AMD Eyefinity with Windows 7 or Linux)
	Shading Architecture	Shader Model 5.0
	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) Red Hat Enterprise Linux(RHEL) 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
	Power Consumption	< 150W
	Note	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.

Technical Specifications - Graphics

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 • 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) 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

Technical Specifications - Graphics

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 • 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) 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 - Graphics

NVIDIA Quadro 6000 6GB Graphics Card	Form Factor	4.376" H x 9.75" L Dual Slot
	Graphics Controller	NVIDIA Quadro 6000 Graphics Card
	Bus Type	PCI Express 2.0 x16
	Memory	6 GB GDDR5 384-bit ECC Memory
	Connectors	1 DVI-I output, 2 DisplayPort outputs, 1 Stereo(3-pin mini DIN); One DP to DVI adapter included with card DVI to VGA, DisplayPort to VGA and DisplayPort to dual link 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	• 30-bit color • 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 • 64x full scene antialiasing (FSAA) / 128x FSAA in SLI Mode • 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 • 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) 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	<250 Watts

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: A 1110W PSU is required for Tesla C2075 on the Z800 NOTE 2: A 600W PSU is required for Tesla C2075 on the Z400 NOTE 3: A 1125W PSU is required for Tesla C2075 on the Z820

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	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)
		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

	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	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	86° F (30° C)	
	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.	

Technical Specifications - Optical and Removable Storage

HP Slot Load DVD+/-RW Drive	Description	Slim-Line, Slot-load	
	Mounting Orientation	Either horizontal or vertical	
	Interface Type	SATA	
	Dimensions (WxHxD)	12.7 x 1.2 x 12.9 cm (5 x 0.5 x 5 in)	
	Disc Formats	DVD-RAM DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R CD-RW	
	Disc Capacity	DVD-ROM	5/9/10/18 G DVD-Single / Dual (PTP, OTP) (Read Only) 4.7G DVD±R/RW (Read & Write) DVD±R Dual (Read & Write) 80mm DVD DVD-RAM (Read & Write)
		CD-ROM	650 MB CD-ROM (Read Only) 80mm CD 800/700/650/ CD-Recordable (Read & Write) 700/650MB CD-Rewritable (Read & Write) 700/650MB High Speed CD-Rewritable (Read & Write) 700/650MB Ultra & Ultra+ Speed CD-Rewritable (Read & Write)
		Full Stroke DVD	< 270 ms (seek)
		Full Stroke CD	< 250 ms (seek)
	Maximum Data Transfer Rates	CD ROM Read	CD-ROM, CD-R and CD-RW Up to 24X
		DVD ROM Read	DVD-RAM Up to 5X DVD Single layer Up to 8X DVD Dual Layer up to 6X
	Power	Source	SATA DC power receptacle
		DC Power Requirements	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC 40 mA typical, 800 mA maximum
	Operating Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Operating Systems Supported	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, 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	Factory integrated only. Not available as a kit.

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	<275 ms (seek)	
	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

		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	41° to 122° F (5° to 50° C)
	Relative Humidity	15% to 80%
	Maximum Wet Bulb Temperature	86° F (30° C)
	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)
HP DX115 Removable Drive Enclosure	Interface Type	Compatible with SAS or SATA controllers
	Dimensions (WxHxL)	147.6 x 41.1 x 205 mm (5.81 x 1.62 x 8.08 in)
	Weight	Frame and Carrier: 1.73 kg (3.8 lbs) Carrier: 0.45 kg (1 lbs)

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 connectors (Rear)
	Internal Connectors	One 10-Pin Header connector
	System Requirements	Windows 7 Professional 32-bit and 64-bit, Microsoft® Windows® XP Professional, Windows XP Home, Windows Vista, SLED 11 and RHEL 6. Intel Pentium® G series or higher processor, 128-MB RAM, 1-GB Hard Drive, CD-ROM drive, built in sound system, Available 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	Windows 7 Professional 32-bit and 64-bit, Windows Vista® Business 32-bit and 64-bit, Windows® XP Professional, XP Professional 64-bit, RHEL 6 and SLED 11.

Integrated Intel 82579LM PCIe GbE Controller	Connector	RJ-45
	Controller	Intel 82579LM GbE platform LAN connect networking controller
	Memory	24 KB FIFO packet buffer memory
	Data Rates Supported	10/100/1000 Mbps
	Compliance	802.1P, 802.1Q, 802.2, 802.3, 802.3ab, 802.3az, 802.3u
	Bus Architecture	PCI Express and SMBus
	Data Transfer Mode	PCIe-based interface for active state operation (S0 state) and SMBus for host and management traffic (Sx low power state)
	Power Requirement	Requires 3.3V and 1.05V or just 3.3V with integrated regulators
	Boot ROM Support	Yes
	Network Transfer Mode	Full-duplex; Half-duplex (not supported 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
	Management Capabilities	WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic. AMT 7.0 support

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) 5, 6; Novell SLED 10 & 11
	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
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, SUSE Linux Enterprise Desktop (SLED) 11 RHEL 4 and 5, SLED 10, are not supported on the Z220 CMT/SFF
	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