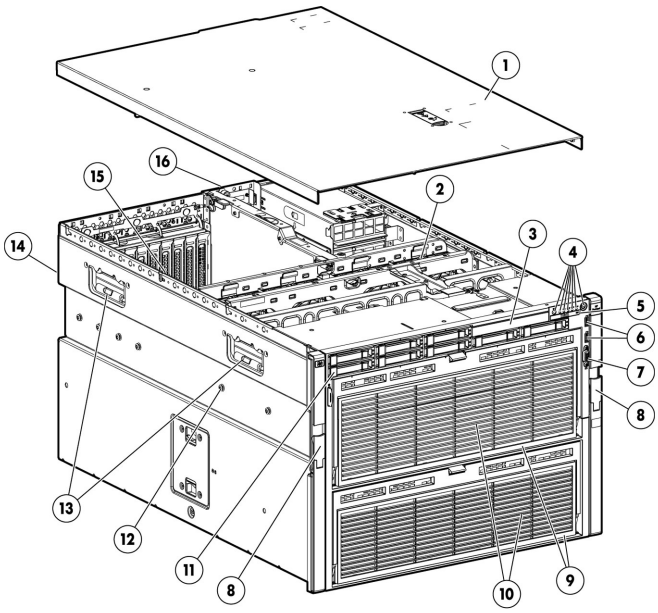
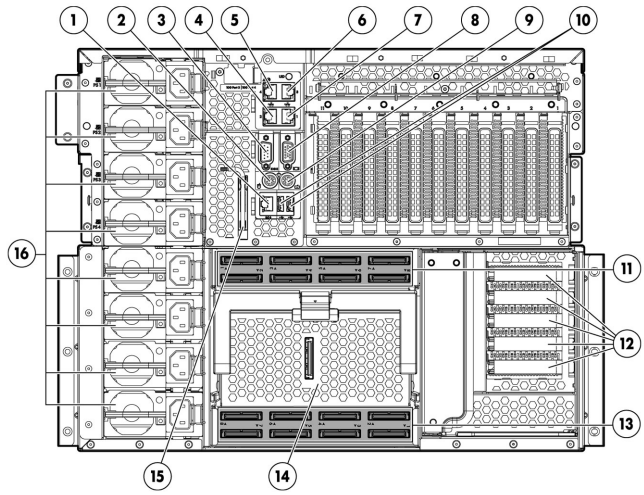
Overview

HP ProLiant DL980 G7 with HP PREMA Architecture is an eight socket server built to handle the largest x86 enterprise environments with confidence. The DL980 G7 blends industry standard economies with advanced mission critical capabilities to deliver balanced scaling, self healing resiliency and breakthrough efficiencies needed in essential enterprise compute environments. Whether housing a single very large data intensive workload, or many consolidated or virtualized workloads to improve resource utilization, the DL980 G7 featuring HP PREMA Architecture with Smart CPU caching and a resilient system fabric, is designed to reduce bottlenecks, improve throughput and performance, as well as deliver enhanced reliability not previously available in an x86 environment.





Front View:

1. Quick removal access panel
2. 8 hot plug redundant fans standard on all models, upper four fan positions shown, lower four not shown
3. DVD drive bay
4. Front panel LED display and Power button
5. Slide-out System Insight Display
6. Two front accessible USB 2.0 ports
7. One front video port
8. Quick release lever for fast server access
9. Upper and lower front accessible processor and memory drawer
10. Support for up to eight 10-core Intel Xeon processors (4 processors in upper and 4 processors in the lower drawer)
11. Support for up to 8 small form factor (SFF) SAS drives
12. Universal tool-less "Snap In" Sliding Rail Solution
13. Server lifting handles
14. 8U rack form factor
15. Up to 11 full height/full length slots supported
16. Hot Plug Redundant Power Supplies (4 or 8 depending on the model)

Rear View:

1. Integrated Lights-Out 3 port
2. Mouse port
3. Serial port
4. Gigabit NIC port
5. Gigabit NIC port
6. Gigabit NIC port
7. Gigabit NIC port
8. Video port
9. Keyboard port
10. Two USB ports
11. Upper XNC ports
12. Up to 5 low profile slots supported
13. Lower XNC ports
14. XNC module
15. Service tool
16. Power supplies (4 or 8 depending on the model)

What's New

- Support for HP StoreFabric SN1000 16Gb Host Bus Adapters
- Support for HP Smart Array P421 Controller
- Support for HP Ethernet 10Gb 2-port 530T Adapter
- Support for HP 3TB G2 Multi Level Cell PCIe ioDrive2 IO Accelerator
- Support for HP ProLiant DL980 331i SPI Board based on integrated 331i quad port 1GbE networking controller
- Support for HP ProLiant NC375i SPI Board based on integrated NC375i quad-port 1GbE networking controller

Standard Features

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.

Processor Four or Eight of the following processors depending on model	**Ten-Core Processors** Intel® Xeon® E7-2850 (2.00GHz/10-core/24MB/130W) Processor Intel® Xeon® E7-2860 (2.26GHz/10-core/24MB/130W) Processor Intel® Xeon® E7-4870 (2.4GHz/10-core/30MB/130W) Processor **Eight-Core Processors** Intel® Xeon® E7-2830 (2.13GHz/8-core/24MB/105W) Processor **Six-Core Processors** Intel® Xeon® E7-4807 (1.86GHz/6-core/18MB/95W) Processor
Cache Memory One of the following depending on Model	30MB (1x30MB) Level 3 cache **NOTE:** For E7-4870 Processor only. 24MB (1 x 24MB) Level 3 cache **NOTE:** For E7-2830, E7-2850 and E7-2860. 18MB (1 x 18MB) Level 3 cache **NOTE:** For E7-4807 Processor only.
Chipset	Industry Standard Intel® 7500 Chipset Hewlett-Packard DL980 G7 Node Controller **NOTE:** Up to three Industry Standard Intel® 7500 Chipsets with six high-speed interconnects up to 6.4GT/s. **NOTE:** For more information regarding Intel chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/
Upgradeability	Upgradeable to eight processors
Memory Protection	Advanced ECC Mirrored Memory Online Spare Memory Rank Dynamic Device Data Correction (Intel Xeon E7 Family)
Memory	Type: PC3-10600R Registered Low Voltage (1.35V) DIMMs (DDR3) Maximum: 4TB (128 x 32GB)

Standard Features

Network Controller Choose one of the following	HP ProLiant DL980 NC375i SPI Board **NOTE:** Optional Dual Port 10GbE upgrade (replaces two 1G ports). HP ProLiant DL980 331i SPI Board **NOTE:** Does not support 10GbE upgrade

Expansion Slots

NOTE: Up to 16 slots supported: 11 full length/full height and 5 low profile slots. Base I/O backplane configuration: 2 PCI-E 2.0 x8, 3 PCI-E x4. Optional full height/full length I/O backplanes - (choose only one): 2 PCI-E 2.0 x16, 1 PCI-E 2.0 x4, 2 PCI-X OR 4 PCI-E 2.0 x8, 1 PCI-E 2.0 x4, 1 PCI-E 1.1 x4. Optional low profile I/O backplane: 4 PCI-E 2.0 x8, 1 PCI-E 2.0 x4

Expansion Slots with No Option Card	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor	Notes
	1	N/A	N/A	N/A	N/A	N/A	N/A
	2	N/A	N/A	N/A	N/A	N/A	N/A
	3	N/A	N/A	N/A	N/A	N/A	N/A
	4	N/A	N/A	N/A	N/A	N/A	N/A
	5	N/A	N/A	N/A	N/A	N/A	N/A
	6	N/A	N/A	N/A	N/A	N/A	N/A
	7	PCI Express Gen2	x4	x8	0x05	FH/FL	
	8	PCI Express Gen2	x4	x8	0x08	FH/FL	
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL	
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL	
	11	PCI Express Gen2	x8	x16	0x11	FH/FL	

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Standard Features

Expansion Slots with Combination PCI-X, PCI-e and 300W GPU I/O Expander	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor	Notes
	1	PCI-X	64-bit	N/A	0x72 (Device 1)	FH/FL	100MHz
	2	PCI-X	64-bit	N/A	0x72 (Device 2)	FH/FL	100MHz
	3	PCI Express Gen2	x16	x16	0x76	FH/FL	
	4	PCI Express Gen2	x4	x8	0x79	FH/FL	
	5	N/A	N/A	N/A	N/A	N/A	N/A
	6	PCI Express Gen2	x16	x16	0x84	FH/FL	
	7	PCI Express Gen2	x4	x8	0x05	FH/FL	
	8	PCI Express Gen2	x4	x8	0x08	FH/FL	
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL	
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL	
	11	PCI Express Gen2	x8	x16	0x11	FH/FL	

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Expansion Slots with Standard PCI-e option I/O Expander	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor	Notes
	1	PCI Express Gen1	x4	x8	0x71	FH/FL	
	2	PCI Express Gen2	x8	x16	0x74	FH/FL	
	3	PCI Express Gen2	x8	x16	0x77	FH/FL	
	4	PCI Express Gen2	x4	x8	0x7A	FH/FL	
	5	PCI Express Gen2	x8	x16	0x84	FH/FL	

Standard Features

	6	PCI Express Gen2	x8	x16	0x87	FH/FL	
	7	PCI Express Gen2	x4	x8	0x05	FH/FL	
	8	PCI Express Gen2	x4	x8	0x08	FH/FL	
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL	
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL	
	11	PCI Express Gen2	x8	x16	0x11	FH/FL	

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Expansion Slots with Low Profile I/O expander (PCI-e option)	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor	Notes
	7	PCI Express Gen2	x4	x8	0x05	FH/FL	
	8	PCI Express Gen2	x4	x8	0x08	FH/FL	
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL	
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL	
	11	PCI Express Gen2	x8	x16	0x11	FH/FL	
	12	PCI Express Gen2	x8	x16	0x71	LP	
	13	PCI Express Gen2	x8	x16	0x74	LP	
	14	PCI Express Gen2	x4	x8	0x77	LP	
	15	PCI Express Gen2	x8	x16	0x7A	LP	
	16	PCI Express Gen2	x8	x16	0x84	LP	

Standard Features

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Expansion Slots with Combination PCI-X, PCI-e and 300W GPU and Low Profile PCI-e I/O Expanders	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor	Notes
	1	PCI-X	64-bit	N/A	0x52 (Device 1)	FH/FL	100MHz
	2	PCI-X	64-bit	N/A	0x52 (Device 2)	FH/FL	100MHz
	3	PCI Express Gen2	x16	x16	0x56	FH/FL	
	4	PCI Express Gen2	x4	x8	0x59	FH/FL	
	5	N/A	N/A	N/A	N/A	N/A	N/A
	6	PCI Express Gen2	x16	x16	0x5C	FH/FL	
	7	PCI Express Gen2	x4	x8	0x05	FH/FL	
	8	PCI Express Gen2	x4	x8	0x08	FH/FL	
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL	
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL	
	11	PCI Express Gen2	x8	x16	0x11	FH/FL	
	12	PCI Express Gen2	x8	x16	0xA1	LP	
	13	PCI Express Gen2	x8	x16	0xA4	LP	
	14	PCI Express Gen2	x4	x8	0xA7	LP	
	15	PCI Express Gen2	x8	x16	0xAA	LP	
	16	PCI Express Gen2	x8	x16	0xAD	LP	

Standard Features

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Expansion Slots with Standard PCI-e and Low Profile PCI-e option I/O Expanders	Expansion Slot #	Technology	Width	Connector Width*	Bus Number(*)(**)	Form Factor
	1	PCI Express Gen1	x4	x8	0x51	FH/FL
	2	PCI Express Gen2	x8	x16	0x54	FH/FL
	3	PCI Express Gen2	x8	x16	0x57	FH/FL
	4	PCI Express Gen2	x4	x8	0x5A	FH/FL
	5	PCI Express Gen2	x8	x16	0x5D	FH/FL
	6	PCI Express Gen2	x8	x16	0x60	FH/FL
	7	PCI Express Gen2	x4	x8	0x05	FH/FL
	8	PCI Express Gen2	x4	x8	0x08	FH/FL
	9	PCI Express Gen2	x8	x16	0x0B	FH/FL
	10	PCI Express Gen2	x4	x8	0x0E	FH/FL
	11	PCI Express Gen2	x8	x16	0x11	FH/FL
	12	PCI Express Gen2	x8	x16	0xA1	LP
	13	PCI Express Gen2	x8	x16	0xA4	LP
	14	PCI Express Gen2	x4	x8	0xA7	LP
	15	PCI Express Gen2	x8	x16	0xAA	LP
	16	PCI Express Gen2	x8	x16	0xAD	LP

Standard Features

* Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number.
** Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus).
FL= Full length; FH = Full height; LP = low-profile.

Expansion Slot Restrictions

Up to 16 I/O cards are supported within the DL980 server, however due to I/O port space limitations, no more than 11 of any combination of the following I/O cards may be installed in the DL980 server at one time:

- HP SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter (PN 614988-B21)

Storage Controller

HP Smart Array P410i controller with optional FBWC

The Flash Backed Write Cache (FBWC) increases cache data retention capabilities from two days of existing battery backed write cache (BBWC) to infinite data retention.

- Standard on 4P Models, optional on factory integrated models
- Transportable data protection
- Increases overall controller performance

Internal Storage Devices

Diskette Drive	None
Optical Drive	Slimline DVD-RW Drive standard
Hard Drives	None ship standard
Hard Disk Drive Backplane	Internal SAS backplane supports up to eight SFF hard disk drives

Maximum Internal Storage

Hot Plug SFF SAS	7.2TB	8 x 900GB
Hot Plug SFF SAS SSD	3.2TB	8 x 400GB

Interfaces

Serial	1
Video	1 front; 1 rear
SD slot	1
Network RJ-45	4
iLO 3 Remote Management	1
Keyboard	1
Pointing Device (Mouse)	1
USB 2.0 Ports	6 total: 2 front (video); 2 rear (video, NIC); 2 internal

Standard Features

Industry Standard Compliance	ACPI 2.0. Compliant PCIE 2.0 Compliant PXE Support WOL Support Physical Address Extension (PAE) Support Microsoft® Logo certifications USB 2.0 Support
Server Power Cords	One 6' highline (IEC-IEC) power cord per power supply is shipped standard with each system. **NOTE:** If customers require a local power cord, they can check the power cord matrix for the appropriate country specific sku. Please see the following power cord matrix for details: http://www.hp.com/go/powercordmatrix
Power Supply	**NOTE:** Rear accessible Hot Plug Power Supplies with option for redundancy (Redundant power supplies are standard on some models). E7-2800 4P Model: (4) 1200W Common Slot Platinum Power Supplies (220VAC only) E7-4800 4P Model: (8) 1200W Common Slot Platinum Power Supplies (220VAC only) **NOTE:** The HP ProLiant DL980 G7 requires four power supplies to operate. With four power supplies there is no power redundancy. Eight power supplies are required for power redundancy. The level of redundancy will be reported during the system power on.
System Fans	8 Hot plug, redundant fans ship standard
Required Cabling	For required cabling information, refer to the HP Web site at: www.hp.com/servers/dl980
Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server Microsoft Windows Server Hyper V Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) Oracle Solaris Oracle Linux VMware **NOTE:** For more information on HP's Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server, please visit our Support Matrix at: http://www.hp.com/go/ossupport and our driver download page www.hp.com/support/DL980G7.
Graphics	Integrated ATI ES1000 with 32MB embedded video SDRAM Max Resolution 1280 x 1024 x 16M color

Standard Features

Form Factor	Rack (8U = 14 inches) Ships with Quick Deploy Sliding Rail System, an ambidextrous cable management arm and quick release levers for fast and easy serviceability and in-rack tool-less access to major components.	
HP Insight management software	HP Insight Foundation	Managing the growing number of servers can be complex and expensive for your organization. IT managers need to address changing business needs with tools that meet the challenges of managing today's complex Datacenters. HP provides management solutions that are designed to simplify a server's installation, configuration and maintenance throughout the entire server lifecycle. This provides the customer with higher levels of operational efficiency and highly reliable systems: www.hp.com/go/foundation. The foundation pack includes: ● HP SmartStart ● HP Management DVD ● HP ProLiant Smart Update Firmware DVD SmartStart version supported (minimum): SmartStart 8.5 http://www.hp.com/servers/smartstart **NOTE:** In an effort to support reducing our environmental impact, the HP Insight Foundation Suite for ProLiant media will be available as a selectable option for this server at time of order of a CTO SKU. This will allow customers to order the number of media kits that best meet their needs and eliminate receiving unnecessary duplicate media.
	HP Integrated Lights-Out (iLO)	HP Integrated Lights-Out (iLO) simplifies server setup, health monitoring, power and thermal control, and lights-out remote administration of ProLiant ML, DL, and BL servers. HP iLO functions without additional software and can be accessed from any location via a web browser. HP iLO works hand-in-hand with HP Systems Insight Manager, Insight Control suites, and Insight Dynamics for ProLiant, helping customers unleash the value of the ProLiant platform and deliver the highest possible quality of IT service. HP iLO can be purchased stand-alone and it also is included with the purchase of HP Insight Control. For more information, visit: www.hp.com/go/iLO

Standard Features

Intelligent Manageability

HP Systems Insight Manager
SmartStart
Redundant ROM
Remote Flash ROM
Management Agents
Integrated Management Log (IML)
Automatic Server Recovery-2 (ASR-2)
ROM-Based Setup Utility (RBSU)
Dynamic Sector Repairing (with Smart Array Controllers)
Drive Parameter Tracking (with Smart Array Controllers)
Pre-Failure Warranty (covers processors, SAS hard drives and memory)
Redundant/adaptive load balancing NIC Support
Hot Spare Boot
NOTE: Upon the event of a failed processor in a multi-processing environment, the system will automatically reboot and use the remaining good processor(s).

Security

Power-on password
Keyboard password
External USB port enable/disable
Network Server Mode
Serial interface control
Administrator's password
Removable CD-ROM or DVD drive

Warranty

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HP Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.
NOTE: Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have HP replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Optional Features

HP Insight management software	HP Insight Control	HP Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. Two versions of Insight Control are available, to serve environments requiring either a Linux-based or a Windows-based central management server: HP Insight Control for Linux, and HP Insight Control. See www.hp.com/go/insightcontrol HP Insight Control includes one year of 24 x 7 HP Software Technical Support and Update Service ensuring rapid access to HP support staff and proactive delivery of software updates. For more information about this service, please visit: http://www.hp.com/services/insight.
	HP Insight Dynamics for ProLiant	HP Insight Dynamics for ProLiant, a product option, is an integrated command center that enables IT Staff personnel to continuously analyze and optimize a converged infrastructure, while automating and reducing the cost of common data center tasks by as much as 40 percent. As a powerfully integrated by design toolkit to accelerate complex technology projects and simplify daily operations that ultimately enable IT Staff personnel to dynamically keep pace with the organizations changing business requirements. It enables them to plan capacity and power continuously, balance across physical and virtual resources, and ensure cost-effective high availability. It also enables IT organizations to provision infrastructure consistently and automatically from pools of shared resources using a self-service portal. Resources provisioned can range from a single virtual machine to complex multi-tier environments and their associated physical and virtual resource requirements. In addition to the previous functional benefits, it also provides a cost-effective disaster recovery for physical and virtual environments that works with HP Continuous Access software for both the Enterprise Virtual Array and the XP storage array allowing application environments to be reactivated in minutes with the touch of a button to a remote location. **NOTE:** For more information, visit: http://www.hp.com/go/insightdynamics

Optional Features

High Performance Clusters	HP Cluster Platforms	HP Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. http://www.hp.com/go/clusters
	HP HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
	HP Cluster Management Utility	HP Cluster Management Utility (CMU) is an HP-licensed and HP-supported suite of tools that are used to manage large-scale Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective. http://www.hp.com/go/cmu
	HP HPC Linux Value Pack	HP HPC Linux Value Pack (Value Pack) is an HP-licensed and HP-supported specially priced software bundle for the development and deployment of applications on HPC Cluster Platforms. Value Pack includes the Platform HPC Enterprise Edition suite of tools including the LSF workload scheduler, the HP-MPI parallelization library. Also included are the HP Unified Parallel C compiler and the HP Shmem library, as well as the execution environments for the libraries and compiler. HP HPC Linux Value Pack

Factory Express Portfolio for Servers and Storage	HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed. Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage: HP Integrity, HP ProLiant, HP ProLiant Server Blades, HP BladeSystem, HP 9000 servers as well as the MSAxxxx, VA7xxx, EVA, XP, rackable tape libraries and configurable network switches. For more information on Factory Express services for your specific server model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

HP Simple Configurator	SCE is a guided self service tool to help sales and non technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact HP's Customer Business Center or an Authorized Partner for assistance. http://www.hp.com/products/configurator

Service and Support

Service and Support

HP Technology Services for HP Proliant DL980 Servers
Capitalizing on HP ProLiant DL980 server capabilities requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP Services.

What HP Technology Services can do for you
HP Technology Services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions. This way, HP proposes services solutions that include more than just uplift of base warranty. You can get the support you need by choosing from one of a number of service packaged solutions we have designed to address wider set of customer support needs.

HP Technology Services meets business challenges with support services offered in three as- **Optimized Care, Standard Care, and Basic Care** - available for each product group. These support services enable customers to optimize technology operations, minimize risk and drive better business outcomes with easy-to-buy, easy-to-use scalable support for devices in their converged infrastructure.

Optimized Care

Optimized Care: delivers support services to maintain servers at optimum performance availability. The services included are:

HP Installation and Start up Services
Provides for the basic hardware installation and Start up Services for HP branded servers, to assist you in bringing your new hardware into operation in a timely and professional manner.
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN

3-Year HP Proactive Care 6 Hour Call to Repair Service
This service has been specifically designed to meet the needs of customers who run their business processes on HP x86 Servers Platforms. This service combines reactive and proactive services to help customers with an easy to purchase and cost efficient solution to resolve complex problems faster & more easily while reducing unplanned outages.

http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-8855ENW&cc=us&lc=en

Additional Services:
Proactive Care Personalized Support Option, which is an enhancement to existing Proactive Care service. This service includes an Account Support Manager (ASM) to provide specific technical and operational advice to help maximize performance of customer's IT environment.

Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); Microsoft or Linux or VMware education courses, Installation and Start up services for Insight Control, Proactive Select Credits.

Standard Care

Standard Care: Support services to maintain high level of server availability. The services included are:

HP Installation and Start up Services Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN

3-Year HP Proactive Care 24x7 Service

This service has been specifically designed to meet the needs of customers who run their business processes on HP x86 Servers Platforms. This service combines reactive and proactive services to help customers with an easy to purchase and cost efficient solution to resolve complex problems faster & more easily while reducing unplanned outages.

http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-8855ENW&cc=us&lc=en

Additional Services:

Proactive Care Personalized Support Option, which is an enhancement to existing Proactive Care service. This service includes an Account Support Manager (ASM) to provide specific technical and operational advice to help maximize performance of customer's IT environment.

Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); Microsoft or Linux or VMware education courses, Installation and Start up services for Insight Control, Proactive Select Credits.

Basic Care

Basic Care: is the minimum recommended support service level. The services included are:

HP Installation and Startup Services
Provides for the basic hardware installation of HP branded servers, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner.

http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN

3-Year HP Collaborative Support 24x7
Provides full hardware and basic SW support for HP Proliant DL980 servers along with diagnosis and advice on problem resolution for industry standard software products from major independent software vendors (ISVs). This service provides single point of contact for support call management, server problem diagnosis, HW problem resolution, and basic SW problem diagnosis, fault isolation, and resolution if a SW fix is available to HP.

http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA3-8232ENN&cc=us&lc=en

Additional Services: Software OS (Microsoft, Linux (SUSE/Red Hat) & VMware Installation & Start Up and Software Support); Factory Express, Proactive Select Credits, Installation and Start up services for Insight Control.

Insight Remote Support

HP Insight Remote Support (HP Insight RS) delivers secure **remote monitoring 24 X 7, with anytime, anywhere access via HP Insight Online** for nearly continuous, automated remote event monitoring together with advanced fault detection and notification. Information is sent to HP support staff or Authorized Partners. HP Insight Remote Support comes included with a valid HP warranty, HP Care Pack Service or HP contractual support agreement
Learn more at: www.hp.com/go/insightremotesupport

Service and Support

For more information To learn more on HP Business Critical System services, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: http://www.hp.com/services/bcs

Pre-configured Models

NOTE: For the Standard Features shipped in the "Factory Integrated Models", please see the "Configuration Information - Factory Integrated Models" section.
NOTE: Pre-configured models ship with the configurations below. Options can be selected from the Core or Additional options section of this QuickSpecs.
NOTE: HP does not allow factory integration of options into pre-configured models. Any additional options purchased will be shipped separately.
NOTE: If you desire a custom configuration please see "Configuration Information - Factory Integrated Models" section of this QuickSpecs.
NOTE: Not all models are available in all regions. Check with your local country HP offices for availability.

HP ProLiant DL980 G7 E7-4870 2.4GHz 10 Core 4p Server AM447A	**Processor(s)**	(4) Intel® Xeon® E7-4870 (2.4GHz/10-core/30MB/130W) Processors
	Cache Memory	30MB (1 x 30MB) Level 3 cache
	Memory	256GB (32 x 8GB) PC3-10600R Registered DIMMs (DDR3)
	Network Controller	HP NC375i Integrated Quad Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410i Controller with 512MB FBWC
	Hard Drives	None ship standard
	Internal Storage	7.2TB max (with optional 900GB SAS hard drives)
	Optical Drive	Slimline DVD-RW Drive standard
	Power Supply	Eight 1200W Common Slot Platinum power supplies standard (fifth - eighth power supply are for redundancy)
	Fans	8 Hot plug, redundant fans ship standard
	Integrated Lights-Out	HP Integrated Lights-Out 3 (iLO 3) management processor (integrated on system board)
	Insight Control	HP Insight Control No Media single server license, including 1year of 24x7 Technical Support
	Form Factor	Rack 8U
	Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response.

Pre-configured Models

HP ProLiant DL980 G7 E7-2860 2.26GHz 10 Core 4p Server AM448A	**Processor(s)**	(4) Intel® Xeon® E7-2860 (2.26GHz/10-core/24MB/130W) Processors
	Cache Memory	24MB (1 x 24MB) Level 3 cache
	Memory	128GB (16 x 8GB) PC3-10600R Registered DIMMs (DDR3)
	Network Controller	HP NC375i Integrated Quad Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410i Controller with 512MB FBWC
	Hard Drives	None ship standard
	Internal Storage	7.2TB max (with optional 900GB SAS hard drives)
	Optical Drive	Slimline DVD-RW Drive standard
	Power Supply	Four1200W Common Slot Platinum power supplies standard
	Fans	8 Hot plug, redundant fans ship standard
	Integrated Lights-Out	HP Integrated Lights-Out 3 (iLO 3) management processor (integrated on system board)
	Insight Control	HP Insight Control No Media single server license, including 1year of 24x7 Technical Support
	Form Factor	Rack 8U
	Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response.

HP ProLiant DL980 G7 E7-2830 2.13GHz 8 Core 4p Server AM449A	**Processor(s)**	(4) Intel® Xeon® E7-2830 (2.13GHz/8-core/24MB/105W) Processors
	Cache Memory	24MB (1 x 24MB) Level 3 cache
	Memory	128GB (16 x 8GB) PC3-10600R Registered DIMMs (DDR3)
	Network Controller	HP NC375i Integrated Quad Port Gigabit Server Adapter
	Storage Controller	HP Smart Array P410i Controller with 512MB FBWC
	Hard Drives	None ship standard
	Internal Storage	7.2TB max (with optional 900GB SAS hard drives)
	Optical Drive	Slimline DVD-RW Drive standard
	Power Supply	Four 1200W Common Slot Platinum power supplies standard
	Fans	8 Hot plug, redundant fans ship standard
	Integrated Lights-Out	HP Integrated Lights-Out 3 (iLO 3) management processor (integrated on system board)
	Insight Control	HP Insight Control No Media single server license, including 1year of 24x7 Technical Support
	Form Factor	Rack 8U
	Warranty	Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response.

Configuration Information - Factory Integrated Models

NOTE: This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: Configure-to-order (CTO) servers must start with a CTO Chassis.
NOTE: FIO indicates that this option is only available as a factory installable option.
NOTE: USE AM451A when configuring the system with Intel Xeon® E7-4800 and E7-2800 Series Processor.

Step 1: Base Configuration

HP Model

HP ProLiant DL980 G7 Configure-to-order Server — AM451A
NOTE: Use with Intel Xeon® E7-4800 and E7-2800 Series Processors only

Factory Integrated Model ships with:

Choose between:
HP ProLiant DL980 NC375i SPI Board Or
HP ProLiant DL980 331i SPI Board
Eight HP Memory Boards
Five PCI-express slots
HP Smart Array P410i/Zero Memory Controller
Four 1200W Common Slot Platinum hot-plug power supplies
Eight redundant hot plug fans
SFF SAS drive cage
HP Integrated Lights-Out 3 (iLO 3) management processor (integrated on system board)
Rack form factor, 8U

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

HP Processors

NOTE: Each processor kit contains four processors.
NOTE: If eight processors are desired select one xxxxxx-L21 and one xxxxxx-B21. Additionally one HP DL980 CPU Assembly: P/N: AM450A for Intel® Xeon® E7-4800 and E7-2800 Series Processors will be required. AM451A is required base configuration for Intel® Xeon® E7-4800 and E7-2800 Series Processors.

Ten-Core Processors

HP DL980 G7 Intel® Xeon® E7-2850 (2.0Ghz/10-core/24MB/130W) FIO 4-processor Kit — 650768-L21
NOTE: QPI speed is 6.4GT/s

HP DL980 G7 Intel® Xeon® E7-2860 (2.26GHz/10-core/24MB/130W) FIO 4-processor Kit — 650769-L21
NOTE: QPI speed is 6.4GT/s

HP DL980 G7 Intel® Xeon® E7-4870 (2.4GHz/10-core/30MB/130W) FIO 4-processor Kit — 650770-L21
NOTE: QPI speed is 6.4GT/s

Eight-Core Processors

HP DL980 G7 Intel® Xeon® E7-2830 (2.13GHz/8-core/24MB/105W) FIO 4-processor Kit — 650767-L21
NOTE: QPI speed is 6.4GT/s

Six-Core Processors

HP DL980 G7 Intel® Xeon® E7-4807 (1.86GHz/6-core/18MB/95W) FIO 4-processor Kit — 650766-L21
NOTE: QPI speed is 4.8GT/s

Configuration Information - Factory Integrated Models

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP DL980 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R57A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	A0R56A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R58A
	HP DL980 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	A0R55A
	HP DL980 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R59A
	HP DL980 32GB (1x32GB) Quad Rank x4 PC3L-8500R-7 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R61A
	HP DL980G7 (E7) Memory Cartridge	A0R60A
HP Optical Drives	HP Slim 12.7mm SATA DVD-ROM Optical Drive	481041-B21
	HP Slim 12.7mm SATA DVD-RW Optical Drive	481043-B21

Step 3: Choose Additional Factory Integratable Options (only one of the following from each list unless otherwise noted)

HP Insight Software	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Single Server FIO License	582765-B21
	HP Insight Control for Linux including 1yr 24x7 Support ML/DL Bundle 1 Server FIO License	TC203A

Step 4: Choose Additional Options for Factory Integration

NOTE: For additional options, please refer to the "Core Options" and "Additional Options" section below.

Core Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Unique Options	HP DL580 G7 PCI Express Kit **NOTE:** Adds four PCI-E 2.0 x8, one PCI-E 2.0 x4 and one PCI-E 1.1 x4.	588137-B21
	HP DL580 G7 PCI-X Combo Express Kit **NOTE:** Adds two PCI-E 2.0 x16, one PCI-E 2.0 x4 and two PCI-X. **NOTE:** Suggested Slot placement: 1. Slot 3 PCIe2 x 16 (16,8,4,2,1) 2. Slot 6 PCIe2 x 16 (16,8,4,2,1) 3. Slot 9 PCIe2 x 16 (8,4,2,1)* 4. Slot 11 PCIe2 x 16 (8,4,2,1)* Slot 9 and 11 are physically a x16 slot but will operate electrically at x8	588139-B21
	HP DL980 LP PCIe I/O Expansion Module **NOTE:** Adds four PCI-E 2.0 x8, one PCI-E 2.0 x4.	AM434A
	HP DL980 E7 Series CPU Installation Assembly **NOTE:** Required for 8P configurations only. This part number will be used for Intel Xeon E7-4800 and E7-2800 Series Processors.	AM450A
HP Processors	**NOTE:** Each processor kit contains four processors. 8P configurations require one HP DL980 CPU Assembly (P/N: AM450A)	
	Ten-Core Processors	
	HP DL980 G7 Intel® Xeon® E7-2850 (2.0Ghz/10-core/24MB/130W) 4-processor Kit **NOTE:** QPI speed is 6.4GT/s	650768-B21
	HP DL980 G7 Intel® Xeon® E7-2860 (2.26GHz/10-core/24MB/130W) 4-processor Kit **NOTE:** QPI speed is 6.4GT/s	650769-B21
	HP DL980 G7 Intel® Xeon® E7-4870 (2.4GHz/10-core/30MB/130W) 4-processor Kit **NOTE:** QPI speed is 6.4GT/s	650770-B21
	Eight-Core Processors	
	HP DL980 G7 Intel® Xeon® E7-2830 (2.13GHz/8-core/24MB/105W) 4-processor Kit **NOTE:** QPI speed is 6.4GT/s	650767-B21
	Six-Core Processors	
	HP DL980 G7 Intel® Xeon® E7-4807 (1.86GHz/6-core/18MB/95W) 4-processor Kit **NOTE:** QPI speed is 4.8GT/s	650766-B21

Core Options

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP DL980 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R57A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	A0R56A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R58A
	HP DL980 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	A0R55A
	HP DL980 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R59A
	HP DL980 32GB (1x32GB) Quad Rank x4 PC3L-8500R-7 (DDR3-1333) Registered CAS-9 LP Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R61A
	HP DL980G7 (E7) Memory Cartridge	A0R60A
	NOTE: Eight memory boards come standard in all pre-configured and CTO models. A maximum of 16 memory boards are supported in the server (requires installation of the HP DL980 CPU Assembly P/N: AM450A).	
HP Optical Drives	HP Slim 12.7mm SATA DVD-ROM Optical Drive	481041-B21
	HP Slim 12.7mm SATA DVD-RW Optical Drive	481043-B21
HP Hard Drives	**NOTE:** The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components. **NOTE:** Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.	
	SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives	
	HP 900GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	619291-B21
	HP 600GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581286-B21
	HP 450GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	581284-B21
	HP 300GB 6G SAS 10K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	507127-B21
	HP 300GB 6G SAS 15K rpm SFF (2.5 inch) Dual Port Enterprise 3yr Warranty Hard Drive	627117-B21
	HP 146GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512547-B21
	HP 72GB 6G SAS 15K rpm SFF (2.5-inch) Dual Port Enterprise 3yr Warranty Hard Drive	512545-B21

Core Options

NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/12244_div/12244_div.html (Worldwide)	
SATA Hot Plug Midline (MDL) Solid State Drives	
HP 120GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572073-B21
HP 60GB 3G SATA SFF (2.5-inch) Midline 1yr Warranty Solid State Drive	572071-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_na/14038_na.html (Worldwide)	
6G SAS Hot Plug Enterprise Performance Solid State Drives	
HP 400GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632494-B21
HP 200GB 6G SAS SLC SFF (2.5-inch) Enterprise Performance 3yr Warranty Solid State Drive	632492-B21
HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632504-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	632502-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)	
6G SAS Hot Plug Enterprise Mainstream Solid State Drives	
HP 400GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	690821-B21
HP 200GB 6G SAS MLC SFF (2.5-inch) Enterprise Mainstream 3yr Warranty Solid State Drive	690819-B21
NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/14038_div/14038_div.html (Worldwide)	

Core Options

HP Networking	**Integrated Network Adapters**	
	HP ProLiant DL980 NC375i SPI Board **NOTE:** For more details on the NC375i adapter, please check the QuickSpec: http://h18004.www1.hp.com/products/quickspecs/13471_div/13471_div.html	A0R66A
	HP ProLiant DL980 331i SPI Board **NOTE:** For more details on the 331i adapter, please check the QuickSpec: http://h18004.www1.hp.com/products/quickspecs/14215_div/14215_div.html	A0R67A
	Gigabit Ethernet Adapters	
	HP NC112T PCI Express Gigabit Server Adapter	503746-B21
	HP NC360T PCI-E Dual Port Gigabit Server Adapter	412648-B21
	HP NC375T PCI Express Quad Port Gigabit Server Adapter	538696-B21
	HP NC365T 4-port Ethernet Server Adapter	593722-B21
	HP NC382T PCI Express Dual Port Multifunction Gigabit Server Adapter	458492-B21
	HP Ethernet 1Gb 2-Port 361T Adapter	652497-B21
	HP Ethernet 1Gb 4-Port 331T Adapter	647594-B21
	HP Ethernet 1Gb 2-Port 332T Adapter	615732-B21
	10 Gigabit Ethernet Adapters	
	HP NC523SFP 10Gb 2-port Server Adapter	593717-B21
	HP NC524SFP Dual Port 10GbE Module	489892-B21
	HP NC550SFP Dual Port 10GbE Server Adapter	581201-B21
	HP NC552SFP 10Gb 2-port Ethernet Server Adapter	614203-B21
	HP Ethernet 10Gb 2-Port 530SFP+ Adapter	652503-B21
	HP Ethernet 10Gb 2-Port 560SFP+ Adapter	665249-B21
	HP Ethernet 10Gb 2-port 530T Adapter	656596-B21
	NOTE: The DL980 G7 can support up to 1. Either four NC523SFP or four NC552 SFP or four 530SFP or four 560SFP or four 530T per server under Windows Server 2008 R2 and RHEL. 2. Eight NC550SFP are supported under RHEL and SUSE. One NC524SFP with either three NC523SFP or three NC552SFP or three 530SFP+ or or three 560SFP+or three 530T or seven NC550SFP. **NOTE:** A minimum of two Gigabytes (2 GB) of server memory is required pereach adapter. **NOTE:** Direct Attach Cable (DAC) for copper environments or fiber transceiversand cables for fiber-optic environments must be purchased separately. **NOTE:** Please see the QuickSpecs for Technical Specifications and additionalinformation: www.hp.com/go/ProLiantNICs	

Core Options

HP InfiniBand	HP InfiniBand 4X DDR ConnectX-2 PCIe G2 Dual Port HCA	592521-B21
	HP InfiniBand 4X QDR ConnectX-2 PCIe G2 Dual Port HCA	592520-B21
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13078_div/13078_div.html	
HP I/O Expansion Options	HP DL580 G7 PCI-X Combo Express Kit **NOTE:** Adds two PCI-E 2.0 x16, one PCI-E 2.0 x4 and two PCI-X. **NOTE:** Suggested Slot placement: 1. Slot 3 PCIe2 x 16 (16,8,4,2,1) 2. Slot 6 PCIe2 x 16 (16,8,4,2,1) 3. Slot 9 PCIe2 x 16 (8,4,2,1)* 4. Slot 11 PCIe2 x 16 (8,4,2,1)* Slot 9 and 11 are physically a x16 slot but will operate electrically at x8	588139-B21
	HP DL580 G7 PCI Express Kit **NOTE:** Adds four PCI-E 2.0 x8, one PCI-E 2.0 x4 and one PCI-E 1.1 x4.	588137-B21
	Low Profile PCI Express I/O Expansion Kit **NOTE:** Adds four PCI-E 2.0 x8, one PCI-E 2.0 x4.	AM434A
HP Power Supplies	**NOTE:** Prior to making a power supply selection it is highly recommended that the HP Power Advisor is run to determine the right size power supply for your server configuration. The HP Power Advisor is located at: www.hp.com/go/hppoweradvisor	
	HP DL980 1200W Common Slot Platinum Hot Plug Power Supply Kit	AM470A

Additional Options

NOTE: Some options may not be integrated at the factory. To ensure only valid configurations are ordered, HP recommends the use of an HP approved configurator. Contact your local sales representative for additional information.

HP Insight Software	**HP Insight Control**	
	HP Insight Control including 1yr 24x7 Technical Support and Updates Electronic License	T9074BAE
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Electronic License	TC278AAE
	HP Insight Control including 1yr 24x7 Technical Support and Updates Single Server License	452148-B22
	HP Insight Control including 1yr 24x7 Support ProLiant ML/DL/BL-bundle Tracking License	TC275A
	HP Insight Software Media Kit	436222-B21
	NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single activation key. **NOTE:** Customer will receive a license entitlement certificate. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support and Update Service. **NOTE:** Licenses ship without media. The HP Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. **NOTE:** For additional license options please see the Insight Control QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
	HP Insight Control for Linux	
	HP Insight Control for Linux including 1yr 24x7 Support Electronic License	TC213AAE
	HP Insight Control for Linux including 1yr 24x7 Support Single Server License	TC209A
	HP Insight Control for Linux Media Kit	TC208A
	NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button). **NOTE:** Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service. **NOTE:** For additional License Kits, including electronic licensing options, please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_div/13019_div.html	
	HP Integrated Lights-Out Advanced (iLO Advanced)	
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	NOTE: This license allows 1 server to be deployed and managed via HP iLO Advanced. Customer will receive a printed license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service **NOTE:** Electronic software is available in all countries except China and Japan. Customers in China and Japan should order the physical equivalent. **NOTE:** For additional license kits, including electronic delivery options, please see the	

Additional Options

	QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/12362_div/12362_div.html	
	HP Insight Control server deployment	
	HP Insight Control Server Deployment including 1yr 24x7 Support Electronic License	T9082AAE
	HP Insight Control Server Deployment including 1yr 24x7 Support Single Server License	452151-B21
	NOTE: Licenses ship without media. The Insight Control Media Kit can be ordered separately, or can be downloaded at: http://www.hp.com/go/insightupdates. **NOTE:** Customer will receive a license entitlement certificate, which must be redeemed online or via fax in order to obtain the license activation key(s). Includes one year of 24 x 7 HP Software Technical Support Service. **NOTE:** For additional license kits please see the Insight Control QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12631_div/12631_div.html	
High Performance Clusters	**HP Cluster Management Utility**	
	HP Cluster Management Utility Compute Node Flexible License **NOTE:** This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	QL803A
	HP Cluster Management Utility License and Media **NOTE:** Order a minimum of one license per cluster to purchase media including software and documentation, which will be delivered to the customer, and also licenses CMU management. No license key is delivered or required. **NOTE:** For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/12612_div/12612_div.html	433257-B21
	HP HPC Linux Value Pack	
	HP High Performance Computing Linux Value Pack 1 Processor Flexible License **NOTE:** This part number can be used to purchase one certificate for multiple licenses with a single activation key. Each license is for one socket (a.k.a. processor). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key.	TC293B
	HP High Performance Computing Linux Value Pack Media Kit **NOTE:** This part number can be used to purchase media including software and documentation, which will be delivered to the customer. **NOTE:** For additional license kits please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/13485_div/13485_div.html	TC294A

Additional Options

HP Graphics Options	HP DL580/DL585/DL980 G7 Power Cable Kit **NOTE:** The HP ProLiant DL980 G7 can support up to 4 (225W) or 3 (300W) Graphic Cards and/or GPGPU Accelerator Options **NOTE:** An option kit will be required per Graphic Card and/or GPGPU Accelerator Options. **NOTE:** Depending on the number of GPGPUs required, customers will need to purchase the following I/O expansion boards: DL580G7 PCI-X / PCI Express I/O Exp. Kit: PN: 588139-B21 (Adds two PCI-E 2.0 x16, one PCI-E 2.0 x4 and two PCI-X).	631660-B21
HP I/O Accelerator Options	HP 365GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673642-B21
	HP 785GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673644-B21
	HP 1205GB Multi Level Cell G2 PCIe ioDrive2 for ProLiant Servers	673646-B21
	HP 2410GB Multi Level Cell G2 PCIe ioDrive2 Duo for ProLiant Servers **NOTE:** Use only on x16 slots for adequate power wattage (Up to 6 cards can be factory integrated in HP ProLiant DL980 Server)	673648-B21
	HP 3TB Multi Level Cell G2 F PCIe ioDrive2 for ProLiant Servers **NOTE:** Up to 10 cards can be factory integrated in HP ProLiant DL980 Server	721458-B21
	HP 160GB Single Level Cell PCIe ioDrive for ProLiant Servers **NOTE:** A low-profile PCI bracket is included for use in low-profile slots.	600278-B21
	HP 320GB Multi Level Cell PCIe ioDrive for ProLiant Servers **NOTE:** A low-profile PCI bracket is included for use in low-profile slots.	600279-B21
	HP 320GB Single Level Cell PCIe ioDrive Duo for ProLiant Servers	600281-B21
	HP 640GB Multi Level Cell PCIe ioDrive Duo for ProLiant Servers	600282-B21
	HP 1.28TB Multi Level Cell PCIe IO Accelerator	641027-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13587_div/13587_div.html (Worldwide)	
HP Security - TPM	HP Trusted Platform Module Option **NOTE:** The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2008. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2008 has not been tampered with while the system was offline. For more information about TPM, including a white paper, go to: www.hp.com/go/TPM. **NOTE:** ProLiant OS pre-installed units will come with the partition required for TPM deployment. **NOTE:** The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.	488069-B21

Additional Options

HP Storage Controllers	**SAS Controllers**	
	Smart Array P212 Controller	
	HP Smart Array P212/256 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462834-B21
	Smart Array P411 Controller	
	HP Smart Array P411/256 2-ports Ext PCIe x8 SAS Controller	462830-B21
	HP Smart Array P411/512 FBWC 2-ports Ext PCIe x8 SAS Controller	578229-B21
	HP Smart Array P411/1G FBWC 2-ports Ext PCIe x8 SAS Controller	572531-B21
	HP P421 Smart Array Controller	
	HP Smart Array P421/1GB FBWC 6Gb 2-ports Ext SAS Controller	631673-B21
	HP Smart Array P421/2GB FBWC 6Gb 2-ports Ext SAS Controller	631674-B21
	HP ProLiant DL980 P421 Mounting Kit	A0R93A
	NOTE: • Up to ten cards are supported. However, a maximum of three cards are supported for factory integration on HP ProLiant DL980 server. • For FBWC functionality, HP ProLiant DL980 P421 Mounting Kit is required and is included on factory integrated orders of the HP Smart Array P421 SAS Controller on the HP ProLiant DL980 server. • For stand-alone orders of the HP Smart Array P421 SAS Controller to use with the HP ProLiant DL980 server, one HP ProLiant P421 Mounting Kit is required for each HP Smart Array P421 SAS Controller.	
	Smart Array P812 Controller	
	HP Smart Array P812/1G FBWC 2-ports Int/4-ports Ext PCIe x8 SAS Controller	487204-B21
	Optional Upgrades **NOTE:** Maximum of two battery or FBWC kits (for Smart Array Controllers) can be installed in upper full height/full length (FH/FL) I/O slot area. Maximum of one battery or FBWC kit (for Smart Array Controller) can be installed in lower low profile (LP) I/O slot area.	
	HP 650 mAh P-Series Battery **NOTE:** Supported on HP Smart Array P212 Controller and HP Smart Array P411 Controller only.	462969-B21
	HP 1GB Flash Backed Cache	534562-B21
	HP 512MB Flash Backed Write Cache	534916-B21
	HP Smart Array Advanced Pack including 1yr 24x7 Technical Support and Updates Single Server License **NOTE:** This part number can be used to purchase a single license or to order multiple licenses with a single activation key. Customers will receive a license entitlement certificate via e-mail. The license entitlement certificate must be redeemed online or via fax in order to obtain the license activation key(s). Include one year of 24x7 HP Software Technical Support Services.	516471-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: http://h18000.www1.hp.com/products/quickspecs/13203_div/13203_div.html (Smart Array P212 Controller) http://h18000.www1.hp.com/products/quickspecs/13202_div/13202_div.html (Smart Array P411 Controller)	

Additional Options

	http://h18000.www1.hp.com/products/quickspecs/13558_div/13558_div.html (Smart Array P812 Controller) http://h18004.www1.hp.com/products/quickspecs/14229_div/14229_div.html (Smart Array P421 Controller) http://h18000.www1.hp.com/products/quickspecs/13200_div/13200_div.html (Smart Array Advanced Pack)	
	SAS HBA	
	HP Modular Smart Array SC08e 2-ports Ext PCIe x8 SAS Host Bus Adapter **NOTE:** This is a 2 x4 External Port HBA **NOTE:** This is only approved for the HP P2000 G3 SAS Modular Smart Array. **NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: http://h18004.www1.hp.com/products/quickspecs/13651_div/13651_div.html (SC08e 6Gb HBA)	614988-B21
HP Power Cords	HP 1.83m 10A C13 CZ Power Cord	AF565A
	HP 1.83m 10A C13 DK Power Cord	AF566A
	HP 1.83m 10A C13 EU Power Cord	AF568A
	HP 1.83m 10A C13 UK Power Cord	AF570A
	HP 1.83m 10A C13 IT/CL Power Cord	AF571A
	HP 2.5m 10A C13 ZA Power Cord	AF567A
HP Tape Backup	**NOTE:** For the complete range of tape drives, autoloaders, libraries and media see: http://www.hp.com/go/tape. For hardware and software compatibility of HP tape backup products see: http://www.hp.com/storage/SPOCK.	
	HP StorageWorks DAT 320 USB (1) in 1U Rack-mount Kit	AP835A
	HP DAT 320 SAS Internal Tape Drive **NOTE:** For installation into 1U SAS rack kit (AE459B) or 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	AJ830A
	HP Ultrium 920 SAS Internal Tape Drive **NOTE:** For installation into 1U SAS rack kit (AE459B) or 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	EH847A
	HP LTO-4 Ultrium 1760 SAS Internal WW Tape Drive **NOTE:** For installation into 1U SAS rack kit (AE459B) or 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	EH919A
	HP LTO-4 Ultrium 1840 SAS Internal Tape Drive **NOTE:** For installation into 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	EH860A

Additional Options

	HP LTO-5 Ultrium 3280 SAS Internal Tape Drive **NOTE:** For installation into 3U SAS rack kit (AG576B). No peripheral bay available for installation into the server. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	EH899A
	HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader **NOTE:** Requires HP 1U Tape Autoloader Rack Kit (AH166A) for rack installation. Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	BL536A
	HP MSL2024 1 LTO-5 Ultrium 3000 SAS Tape Library **NOTE:** Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	BL537A
	HP MSL4048 2 LTO-5 Ultrium 3000 SAS Tape Library **NOTE:** Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	BL538A
	HP MSL8096 2 LTO-5 Ultrium 3000 SAS Tape Library **NOTE:** Connection using HP P212 Smart Array Controller SAS (462828-B21) recommended.	BL539A
HP Disk Backup	**NOTE:** For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range of RDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk backup products see: http://www.hp.com/storage/SPOCK.	
	HP D2D Backup Systems with Backup Data Deduplication	
	HP D2D2504i Backup System **NOTE:** 3.0TB of useable network disk backup capacity. Network connected appliance with connectivity using the iSCSI protocol. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	EJ002B
	HP D2D4112 Backup System **NOTE:** 9.0TB (expandable to 18.0TB) of useable network disk backup capacity. Fibre Channel SAN connected appliance. Direct server attach is not supported, requires connection via SAN fabric.	EH993B
	HP RDX Removable Disk Backup Systems USB	
	HP StorageWorks RDX500 Internal Removable Disk Backup System **NOTE:** For installation into 1U USB Rack-Mount Kit (A8007A). No peripheral bay available for drive installation into the server. 500GB of disk capacity per data cartridge.	AJ934A

Additional Options

HP Storage Options

Storage Fibre Channel HBA

NOTE: The following is a list of all Fibre Channel Host Bus Adapters for Windows and Linux. For detailed compatibility information please see: http://h18006.www1.hp.com/storage/saninfrastructure/hba.html

Brocade Fibre Channel HBAs

HP 81B PCIe 8Gb Fibre Channel Single Port Host Bus Adapter	AP769B
HP 82B PCIe 8Gb Fibre Channel Dual Port Host Bus Adapter	AP770B
HP 41B PCIe 4Gb Fibre Channel Single Port Host Bus Adapter	AP767B
HP 42B PCIe 4Gb Fibre Channel Dual Port Host Bus Adapter	AP768B

Emulex Fibre Channel HBAs

HP SN1000E 16Gb Single Port Fibre Channel Host Bus Adapter **NOTE:** Max of 4 per server.	QR558A
HP SN1000E 16Gb Dual Port Fibre Channel Host Bus Adapter **NOTE:** Max of 4 per server.	QR559A
HP 81E 8Gb Single Port PCI-e Fibre Channel Host Bus Adapter	AJ762B
HP 82E 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ763B

QLogic Fibre Channel HBAs

HP StoreFabric SN1000Q 16Gb Single Port Fibre Channel Host Bus Adapter **NOTE:** Max of 4 per server	QW971A
HP StoreFabric SN1000Q 16Gb Dual Port Fibre Channel Host Bus Adapter **NOTE:** Max of 4 per server	QW972A
HP 81Q PCI-e Fibre Channel Host Bus Adapter	AK344A
HP 82Q 8Gb Dual Port PCI-e Fibre Channel Host Bus Adapter	AJ764A
HP FC1142SR 4Gb PCIe Host Bus Adapter	AE311A
HP FC1242SR 4Gb PCIe DC Host Bus Adapter	AE312A

Converged Network Adapter

HP CN1000E Dual Port Converged Network Adapter **NOTE:** There is a maximum of two CN1000E 2P Converged Network Adapters allowed in this server.	AW520B
HP CN1100E Dual Port Converged Network Adapter **NOTE:** There is a maximum of two CN1100E 2P Converged Network Adapters allowed in this server	BK835A
HP CN1000Q Dual Port Converged Network Adapter **NOTE:** There is a maximum of two CN1100E 2P Converged Network Adapters allowed in this server. **NOTE:** When ordered with NC524SFP maximum of one (1) CN1000E or CN1100E or CN1000Q is supported	BS668A

Additional Options

HP Disk Storage Systems	**MSA SAN Storage Arrays**	
	HP Modular Smart Array 50 Enclosure	364430-B21
	NOTE: Please see the QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/12245_div/12245_div.html (Worldwide)	
	Disk Enclosures	
	HP D2600 Disk Enclosure	AJ940A
	HP D2700 Disk Enclosure	AJ941A
	NOTE: Please see the QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/13404_div/13404_div.html (Worldwide)	
HP Uninterruptible Power Systems	**HP Rack-mountable UPS**	
	HP R1500 G3 Uninterruptible Power Supply (UPS)	
	HP R1.5kVA G3 1U NA Uninterruptible Power System	AF469A
	HP R1.5kVA G3 1U JP/TW Uninterruptible Power System	AF470A
	HP R1.5kVA G3 1U INTL Uninterruptible Power System	AF471A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14059_div/14059_div.html (Worldwide)	
	HP R/T3000 Uninterruptible Power System (UPS)	
	HP R/T3000 3300VA High Voltage NA/JPN 2U Rackmount Uninterruptible Power System	AF453A
	HP R/T3000 3300VA INTL 2U Rackmount Uninterruptible Power System	AF454A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/13417_div/13417_div.html (Worldwide)	
	HP R/T3000 G2 Uninterruptible Power System (UPS)	
	HP R/T3000 G2 2U L530 Low Voltage NA/JP Uninterruptible Power System	AF466A
	HP R/T3000 G2 2U L620 High Voltage NA/JP Uninterruptible Power System	AF467A
	HP R/T3000 G2 2U Detachable Cord High Voltage INTL Uninterruptible Power System	AF468A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14058_div/14058_div.html (Worldwide)	
	HP Rack-Mountable R5500 UPS	
	HP R5500 6000VA INTL 3U Rackmount Uninterruptible Power System	AF416A
	HP R5500 5000kVA NA/JP 3U Rackmount Uninterruptible Power System	AF426A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/11871_div/11871_div.html (Worldwide)	
	R5000 Uninterruptible Power System (UPS)	
	HP R5KVA 3U IEC309-32A High Voltage INTL Uninterruptible Power System	AF461A

Additional Options

	HP R5KVA 3U L630 High Voltage NA/JP Uninterruptible Power System	AF460A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14109_div/14109_div.html (Worldwide)	
	R7000 Uninterruptible Power System (UPS)	
	HP R7KVA 4U 50A High Voltage NA/JP Uninterruptible Power System	AF462A
	HP R7KVA 4U IEC-32A High Voltage INTL Uninterruptible Power System	AF463A
	NOTE: Please see the QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/14110_div/14110_div.html (Worldwide)	
	NOTE: For additional information on HP Uninterruptible Power Systems please go to: www.hp.com/servers/rackups. **NOTE:** For additional information on sizing your server, please reference: http://www.upssizer.com.	
	NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.	
HP Power Distribution Unit	**HP Monitored Power Distribution Unit: Half Rack Version**	
	HP 4.9kVA 24A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF914A
	HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF915A
	HP Monitored Power Distribution Unit: Full Rack Version	
	HP 8.6kVA 24A Single Input Three Phase NA/JP Monitored Power Distribution Unit	AF504A
	HP 8.3kVA 40A Single Input Single Phase NA/JP Monitored Power Distribution Unit	AF506A
	HP 11kVA 16A Single Input Three Phase INTL Monitored Power Distribution Unit	AF508A
	HP 7.3kVA 32A Single Input Single Phase INTL Monitored Power Distribution Unit	AF510A
	NOTE: Please see the following QuickSpecs for additional information: http://h18000.www1.hp.com/products/quickspecs/12118_div/12118_div.html (Worldwide)	
	Modular Power Distribution Units 1U/0U (Up to 32 outlets) **NOTE:** 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).	
	HP 7.3kVA 32A High Voltage INTL Modular Power Distribution Unit	252663-B31
	HP 3.6kVA 16A High Voltage INTL Modular Power Distribution Unit	252663-B24
	NOTE: This PDU has a detachable input power cord and allows for adaptability to country specific power requirements.	
	NOTE: Please see the following QuickSpecs for additional options including shorter jumper cables and country specific power cords: http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.html (Worldwide) **NOTE:** For additional information on HP Power Distribution Units including accessories please go to: www.hp.com/go/pdu.	

Additional Options

NOTE: Please see the UPS and PDU cable matrix's on the HP Power Protection and Management page. Under Power Cords, click on the "HP Power Cord Matrix" link. That link will list cable descriptions, requirements, and specifications for UPS and PDU units. Please see the following link: www.hp.com/products/powercords.

HP Rack Series

HP Rack 10000 G2 Series (Carbon/Graphite Metallic)

HP 10642 G2 Shock Universal Rack	AF002A
HP 10647 G2 Pallet Universal Rack	AF031A
HP 10642 G2 1200mm deep Shock Rack	AF092A
HP 10647 G2 1200mm deep Shock Rack	AF094A

NOTE: It is mandatory to use a shock pallet when shipping racks with equipment installed.

NOTE: Please see the Rack 10000 G2 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/12402_div/12402_div.html (Worldwide)

NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://www.hp.com/go/rackandpower.

NOTE: The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 G2 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.
CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment: Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation). Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).
CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

Quick deploy rail system provides tool-free support for racks with square or round mounting holes (including Compaq/HP 7000, 9000, 10000 G2 and HP series), with an adjustment range of 24" - 36". The ambidextrous cable management arm can be mounted on either the left or right side for improved cable management.

Additional Options

HP Rack Options	**HP KVM Switch Options**	
	HP 2x1Ex16 KVM IP Console Switch G2 with Virtual Media CAC Software	AF621A
	HP 4x1Ex32 KVM IP Console Switch G2 with Virtual Media CAC Software	AF622A
	HP 0x2x16 KVM Server Console Switch G2 with Virtual Media CAC Software	AF618A
	HP 0x2x32 KVM Server Console Switch G2 with Virtual Media CAC Software	AF619A
	HP 1-pack PS/2 Virtual Media Interface Adapter **NOTE:** Requires PS/2 and one USB port on server.	AF604A
	HP Server Console 0x2x8 Port Analog Switch	AF616A
	HP Server Console 0x2x16 Port Analog Switch	AF617A
	HP KVM CAT5 1-pack PS/2 Interface Adapter	262588-B21
	HP KVM CAT5 8-pack PS/2 Interface Adapter	262587-B21
	NOTE: Cat5e cables are required to connect Interface Adapters to Console Switches. Cat5e cables can be found at the following URL: http://www.hp.com/go/kvm.	
	HP 1x4 USB/PS2 KVM Console Switch	AF611A
	HP 1x4 KVM Console 6ft PS2 Cable	AF612A
HP USB and SD Options	HP USB 2-Button Optical Scroll Mouse	DC172B
	HP USB 04 Standard Keyboard	DT528A#ABA
	HP 4GB Secure Digital High Capacity Flash Media Kit **NOTE:** Blank SD media device is supported for use with VMware. SD media must be installed in the internal slot of the ProLiant server. Learn more at: http://www.hp.com/go/proliantvirtualization.	580387-B21
	HP 2GB USB Flash Media Drive Key Kit **NOTE:** HP qualified blank USB key for use with HP ProLiant servers that support the VMware virtualization environment and other HP value-add software like SmartStart. HP recommends this industry standard USB flash device for use with VMware ESXi. USB device must be installed in the internal slot of the ProLiant server for use with VMware ESXi. Refer to HP VMware Getting Started Guide for installation instructions.	608447-B21

Additional Options

HP Care Pack Services	**Hardware Services On-site Service**	
	HP 3 year 4 hour 13x5 ProLiant DL980 Hardware Support	UV301E
	HP 3 year 4 hour 24x7 ProLiant DL980 Hardware Support	UV298E
	6-Hour Call to Repair, On-site Service 7-Day x 24-Hour Coverage, 3 Years (U.S. Part Number)	
	HP 3 year 6 hour 24x7 Call To Repair ProLiant DL980 Hardware Support	UV292E
	Installation & Start-up Services	
	HP Install ProLiant DL980 Hardware only	UV304E
	HP Startup ProLiant DL58x Service	U4618E
	HP Installation and Startup for Insight Control Server Deployment - previously Rapid Deployment Pack	U5683E
	Support Plus 24	
	HP 3 year Support Plus 24 for Microsoft OS ProLiant DL980 Service	UX131E
	HP 3 year Support Plus 24 for Linux Red Hat ProLiant DL980 Service	UX132E
	HP 3 year Support Plus 24 for Linux SuSe ProLiant DL980 Service	UX133E
	NOTE: For more information, customer/resellers can contact: http://www.hp.com/services/carepack	

Memory

NOTE: Memory configurations listed do not apply to "Factory Integrated Models".

HP ProLiant DL980 G7 Models

Memory Subsystem Architecture

Intel Xeon E7 Family, 7500 and 6500 series memory architecture is designed to take advantage of multiple stages of memory interleaving to reduce latency and increase bandwidth.

Each Intel Xeon E7, 7500 and 6500 series processor contains two Memory Controllers as shown in the Processor/Memory interconnect figure below. Each Memory controller has two Scalable Memory Interface (SMI) buses operating in lockstep where each SMI bus connects to a memory buffer. The purpose of the buffer is to convert SMI to DDR3. Each buffer has two DDR3 channels and can support up to four DIMMs for a total of eight DIMMs per cartridge.

- The number of DIMMs or ranks does not affect memory frequency, but can affect memory bandwidth and performance. All DIMMs will run at the highest possible frequency for a given processor.
- DDR3 memory speed is a function of the processors QPI bus speed such that
  - Processors with a QPI speed of 6.4GT will run memory at 1066MHz
  - Processors with a QPI speed of 4.8GT will run memory at 800 MHz

DIMM Installation guidelines

Each memory cartridge can support up to 8 DIMMs, for a system total of 128 DIMMs. When installing DIMM modules in the Memory Cartridge observe the following minimum guidelines:

- UDIMMs are not supported
- Minimum allowable configuration is 16 DIMMs (two DIMMs on each of the two cartridges connected to processor one through four.
- DIMMs must be installed as Quads (four DIMMs with identical characteristics). For configuration simplicity HP recommends using identical part numbered DIMMs throughout when possible.
- DIMM Quads MUST be populated in sequence by letter designation. Install DIMMs 1A and 8A on each cartridge first, followed by DIMMs 3B and 6B on each cartridge, then DIMMs 2C and 7C, and finally DIMMs 4D and 5D last.
- Maximum performance is achieved by balancing DIMM Quads by letter groupings across all memory cartridges. All 1A and 8A DIMMs should be installed (preferably with the same size DIMMs in all memory cartridges across the entire system) first, followed by the B DIMMs, C DIMMs and D DIMMs.

AMP modes Online Sparing and Memory Mirroring have further requirements beyond these listed here. Please refer to the user guide for additional memory configuration requirements.

Memory Cartridge population guidelines

This server contains 8 memory cartridge slots within each processor memory drawer. Observe the following guidelines:

- A memory cartridge must be installed in each slot.
- To maximize performance distribute the total memory capacity evenly between all memory cartridges.
- When operating the system in 40-bit address mode and installing 64x 16GB DIMMs (1TB total memory), the 64 DIMMs must be spread evenly across all 16 memory cartridges, or some of the memory will not be recognized.
- Memory configurations larger than 1TB require the use of 44-bit addressing mode.

Hemisphere mode

The Xeon EX architecture incorporates hemisphere mode, a high performance interleaving technology. Hemisphere mode allows interleaving between the two processor memory controllers internal to each processor.

The DL980 G7 always uses Hemisphere mode. This requires that for each processor, the two memory cartridges attached to the

processor have matching memory configurations. If the two memory configurations are not equal, the DL980 G7 will ignore (waste) the extra memory in the larger configuration.

Memory Performance Optimization

The DL980 G7 supports 128 DIMMs across eight multi-core processors. While there are many DIMM population configurations that can support any desired total memory size, optimal performance can only be achieved when DIMMs are populated to take advantage of the Xeon EX architecture. The largest contributor to performance is to populate each DDR3 channel in each memory cartridge. To achieve this, the minimum DIMM count per cartridge is four. Maximum bandwidth is reached by fully populating all memory cartridges with the maximum number of eight DIMMs per cartridge.

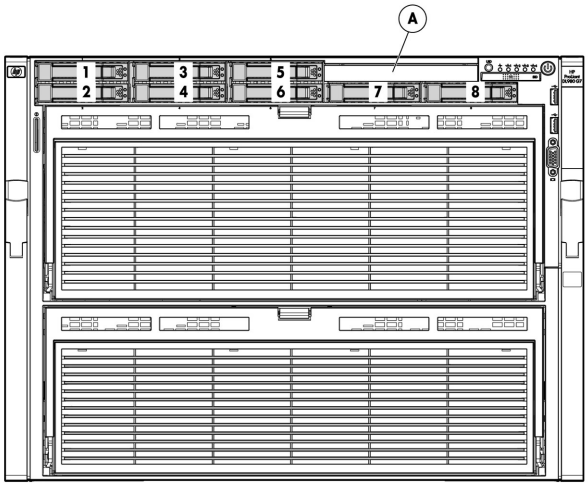
- The more ranks per DIMM the higher the performance, so Quad rank DIMMs perform better than dual rank DIMMs.
- Performance is best when the installed DIMMs are all of equal size.

NOTE: Memory configurations listed do not apply to "Factory Integrated Models". Only registered (RDIMM) speeds of 1066 or 1333 running at 1066 are supported. UDIMMs are not supported.

The following memory options are available from HP:

HP Memory	**Registered DIMMs (RDIMMs)**	
	HP 2GB (1x2GB) Dual Rank x8 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	500656-B21
	HP 4GB (1x4GB) Single Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	593339-B21
	HP DL980 4GB (1x4GB) Single Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R57A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3-10600 (DDR3-1333) Registered CAS-9 Memory Kit	A0R56A
	HP DL980 8GB (1x8GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 Low Power Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R58A
	HP DL980 16GB (1x16GB) Quad Rank x4 PC3-8500 (DDR3-1066) Registered CAS-7 Memory Kit	A0R55A
	HP DL980 16GB (1x16GB) Dual Rank x4 PC3L-10600 (DDR3-1333) Registered CAS-9 LP Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R59A
	HP DL980 32GB (1x32GB) Quad Rank x4 PC3L-8500R-7 (DDR3-1333) Registered CAS-9 LP Memory Kit **NOTE:** For Intel Xeon E7 Family only.	A0R61A
	HP DL580G7/DL980G7 Memory Cartridge	588141-B21
	HP DL980G7 (E7) Memory Cartridge	A0R60A

Storage



A DVD drive bay

1-8 SFF SAS internal drive cage

Drive Support

	Quantity Supported	Position Supported	Controller
Removable Media			
HP Slimline DVD Optical drive	1	A	Integrated SATA
HP Slim SATA DVD RW Optical Drive	1	A	Integrated SATA

Hard Drives

NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

NOTE: Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

SAS Hot Plug SFF (2.5-inch) Enterprise (ENT) Drives

	Quantity Supported	Position Supported	Controller
900GB 6G SAS 10K 600GB 6G SAS 10K 450GB 6G SAS 10K 300GB 6G SAS 10K 300GB 6G SAS 15K 146GB 6G SAS 15K 72GB 6G SAS 15K	Up to 8	1-8	HP Smart Array P410i Controller (standard on server) HP Smart Array P812/1GB FBWC Controller

SATA Hot Plug Midline (MDL) Solid State Drives

Storage

	Quantity Supported	Position Supported	Controller
120GB 3G SATA SFF 60GB 3G SATA SFF	Up to 8	1-8	HP Smart Array P410i Controller (standard on server) HP Smart Array P812/1GB FBWC Controller

6G SAS Hot Plug Enterprise Performance Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 6G SAS SLC SFF 200GB 6G SAS SLC SFF 400GB 6G SAS MLC SFF 200GB 6G SAS MLC SFF	Up to 8	1-8	HP Smart Array P410i Controller (standard on server) HP Smart Array P812/1GB FBWC Controller

6G SAS Hot Plug Enterprise Mainstream Solid State Drives

	Quantity Supported	Position Supported	Controller
400GB 6G SAS MLC SFF 200GB 6G SAS MLC SFF	Up to 8	1-8	HP Smart Array P410i Controller (standard on server) HP Smart Array P812/1GB FBWC Controller

External Storage

	Quantity Supported	Position Supported	Host Controller or Adapter
D2600 Disk Enclosure	Up to 4	External	HP Smart Array P212/ 256 MB Controller
	Up to 8	External	HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812 Controller
D2700 Disk Enclosure	Up to 2	External	HP Smart Array P212/256 MB Controller
	Up to 4	External	HP Smart Array P411/256 MB Controller HP Smart Array P411/512 MB BBWC Controller HP Smart Array P411/1G FBWC Controller HP Smart Array P812 Controller

Maximum Storage Capacity - (External SAS Enclosure Attached)

Internal	7.2TB (8 x 900GB SFF SAS Drives)
External	960TB (80 MSA60 enclosures x 12 drive bays each x 1TB SATA Drives)

Tape and Disk-Based Backup

NOTE: For the complete range of tape drives, autoloaders, libraries and media, including the internal fitting models, see: http://www.hp.com/go/tape. For the complete range of D2D Backup Systems see: http://www.hp.com/go/d2d. For the complete range ofRDX drives and media see: http://www.hp.com/go/rdx. For hardware and software compatibility of HP disk and tape backup products see: http://www.hp.com/storage/SPOCK.

Storage

	Position Supported	Controller	Controller Part Number
HP USB Tape Drives DAT 40 DAT 72 DAT 160 DAT 320 1U USB Rack-Mount Kit	External	USB 2.0 Port	N/A
HP SAS Tape Drives DAT 160 DAT 320 LTO-2 Ultrium 448 LTO-3 Ultrium 920 LTO-4 Ultrium 1760 LTO-4 Ultrium 1840 LTO-5 Ultrium 3000 LTO-5 Ultrium 3280 1U Rack-Mount Kit 3U Rack-Mount Kit	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
HP SCSI Tape Libraries MSL2024 MSL4048 MSL8096 MSL6000	External	HP U320e SCSI Dual Channel Host Bus Adapter	AH627A
HP SAS Tape Autoloaders and Libraries 1/8 G2 Autoloader MSL2024 MSL4048 MSL8096	External	HP Smart Array P212/ZM 1-ports Int/1-ports Ext PCIe x8 SAS Controller	462828-B21
HP USB RDX Removable Disk Backup System RDX160 RDX320 RDX500 RDX750	External	USB 2.0 port	N/A
HP D2D Backup Systems, iSCSI D2D2500i D2D4000i	External	Embedded Network Controller. If the server requires a hardware iSCSI initiator, the QLogic QLA4050 Host Bus Adapter is recommended.	

Storage

HP D2D Backup Systems, Fibre Channel D2D4000fc	External	Direct server attach is not supported, requires connection via SAN fabric. See: http://www.hp.com/storage/SPOCK

Power Specifications

HP DL980 1200W Common Slot Platinum Hot Plug Power Supply Kit					
Part Number	AM470A				
Input Voltage Range (V rms)	200 to 240				
Frequency Range (Nominal) (Hz)	50/60				
Nominal Input Voltage (Vrms)	**200**	**208**	**220**	**230**	**240**
Maximum Rated Output Wattage Rating	1200	1200	1200	1200	1200
Nominal Input Current (A rms)	6.7	6.5	6.1	5.8	5.6
Maximum Rated Input Wattage Rating (Watts)	1290	1290	1290	1290	1290
Maximum Rated VA (Volt-Amp)	1345	1345	1345	1345	1345
Efficiency (%)	93	93	93	93	93
Power Factor	0.97				
Leakage Current (mA)	0.83	0.87	0.92	0.96	1.00
Maximum Inrush Current (A peak)	30				
Maximum Inrush Current duration (mS)	10				
Maximum British Thermal Unit Rating (BTU-Hr)	4403	4403	4403	4403	4403

To review typical system power ratings use the HP Power Advisor which is available via the online tool located at URL: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor

System Unit Rack	**Dimensions** (H x W x D) (with bezel and XNC cables installed)	13.92 x 19.0 x 34.5 in (35.36 x 48.26 x 87.63 cm)	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	205 lb (93 kg)
		Minimum (one hard drive, power supply, and processor installed)	165 lb (75 kg)
	Input Requirements (per power supply)	Rated Line Voltage	200 - 240 VAC
		Rated Input Current	6.6A @ 200-240VAC
		Rated Input Frequency	50 - 60 Hz +/- 3hz
		Rated Input Power	1375W @ 200-240VAC
	BTU Rating	Maximum	14,330 BTU/hr (worst case configuration and utilization)
	Power Specifications	Maximum	4200 W (worst case configuration and utilization)
		NOTE: To review typical system power ratings use the HP Power Advisor which is available online located at url: www.hp.com/go/proliant-energy-efficient or www.hp.com/go/hppoweradvisor - Click on the system of interest. Example: DL980 G7 - Follow the instructions of the next screens.	
	Power Supply Output (per power supply)	Rated Steady-State Power	1200W @ 200 - 240VAC
		Maximum Peak Power	1440W @ 200 - 240VAC
	System Inlet Temperature	Operating	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
		Non-operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Relative Humidity (non-condensing)	Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
		Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude	Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457

			m/min (1500 ft/min).
		Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Acoustic Noise	Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
		Idle	
		L WAd	7.5 Bels
		L pAm	59.7 dB
		Operating	
		L WAd	7.5 Bels
		L pAm	59.7 dB
	Emissions Classification (EMC)	**FCC Rating**	Class A
		Normative Standards	CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1
		NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.	

Integrated Lights-Out 3 Standard (integrated on system board)	**Architecture**	PCI Express based health and remote management ASIC
	Processor	PCI Express RISC processor core running at 250MHz
	Upgradeability	Option firmware upgradeable via flash ROM
	Video Support	1600 x 1200 DVR max resolution
	Interfaces	One Ethernet Sideband connection (10/100/1000 Mb/s)
		One Ethernet network connection (10/100 Mb/s)
	Memory	128-MB DDR with ECC
	Operating System Support	Microsoft Windows Server 2008 R2 Enterprise Edition (64 bit)
		Microsoft Windows Server 2008 Enterprise Edition (64 bit)
		Red Hat Enterprise Linux 5.5 (64 bit)
		SUSE LINUX Enterprise Server 11 (64 bit)
		SUSE LINUX Enterprise Server 10 (64 bit)
		VMware ESX 4.1
	Client System Support	Microsoft Windows 7
		Microsoft Windows XP Professional Edition
		Microsoft Windows Vista Business and Ultimate Editions
		Red Hat Enterprise Desktop 5.00
		SUSE Linux Enterprise Desktop 11
		SUSE Linux Enterprise Desktop 10

Technical Specifications

	Client Browser Support	Microsoft Internet Explorer 8 Microsoft Internet Explorer 7 Microsoft Internet Explorer 6 Firefox 3.5 (on supported Windows and Linux systems) Firefox 3.0 (on supported Windows and Linux systems)
	Command Line Support	Secure Shell and serial port access Secure Socket Layer Secure Shell version 2
	Security	Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface AES encryption of video RC4 encryption of video
	Directory Support Services	Active Directory v1.0 (Windows 2003)
	Driver Support	HP ProLiant iLO 3 Management Controller Driver
	Management protocols supported	SNMP, IPMI 2.0 (system and LAN interface), DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP), HP RIBCL XML
Smart Array P410i Controller	**Disk Drive and Enclosure Interface**	6Gb/s SAS (Serial Attached SCSI)
	SAS Connectors	2 internal (mini SAS) x8 wide port connectors
	Cache Memory Speed	DDR2-800MHz with 40 or 72-bit wide bus provides up to 4.2GB/s maximum bandwidth
	Server Interface	x4 PCIe provides 2GB/s maximum bandwidth.
	SAS Speed	x8 6G SAS provides 4.8GB/s maximum bandwidth.
	Cache Memory	72-bit 512MB or 1GB Flash backed write cache transportable with flash upgrade.
	Logical Drives Supported	Up to 64 logical drives
	Maximum Logical Drive Capacity	Greater than 2TB
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	RAID Support	RAID 6, 6+0 (Advanced Data Guarding) **NOTE:** RAID 6, 6+0 can be enabled with either: • Minimum of 512MB FBWC and Smart Array Advanced Pack License Key option upgrades RAID 5, 5+0 (Distributed Data Guarding) **NOTE:** A minimum of 512MB FBWC is required to enable RAID 5, 5+0 support of the Smart Array P410i RAID 1+0 (Striping & Mirroring) RAID 0 (Striping)

HP ProLiant DL980 NC375i SPI Board	**Network Interface**	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
		IEEE 802.3ad 1000Base-TX	
		IEEE 802.1p 100Base-TX	
		IEEE 802.1q 100Base-TX	
	Data Transfer Method	PCI-Express 2.0 (x8)	
	Controller	Qlogic/NetXen NX3031	
	Network Transfer Rate	10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Full-Duplex)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4, or 5 UTP; up to 328 ft (100 m)
		100Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)
		1000Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)
HP ProLiant DL980 331i SPI Board	**Network Interface**	10Base-T/100Base-TX/1000Base-TX	
	Compatibility	IEEE 802.3 10Base-T	
		IEEE 802.3ab 1000Base-T	
		IEEE 802.3u 100Base-TX	
		IEEE dynamic 802.3ad 1000Base-TX	
		IEEE 802.3x	
		IEEE 802.3az	
		IEEE 1588	
		IEEE 802.1as	
		IEEE 802.1Q 100Base-TX	
	Data Transfer Method	Four lane (x4) PCI Express compatible with x4, x8, and x16 PCI Express slots	
	Controller	Broadcom BCM5719 chipset	
	Network Transfer Rate	10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Full-Duplex)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4, or 5 UTP; up to 328 ft (100 m)
		100Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)
		1000Base-TX	Category 5 or higher UTP; up to 328 ft (100 m)

Technical Specifications

Environment-friendly Products and Approach	**End-of-life Management and Recycling**	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner. The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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