Next Generation ProLiant server technology

The new HP ProLiant family redefines datacentre expectations and economics with the world's smartest servers built for the cloud era.

As demand for enterprise and consumer cloud services explodes, IT departments struggle to keep pace with growing IT scale and complexity. To respond effectively to the cloud era, IT needs smarter systems that learn, connect and adapt. That's the next-generation HP ProLiant servers with Active Insight technologies. The new ProLiant family features a "server IQ" that is over ten times higher than that of the average server.

By collecting over 1,600 system parameters and connecting servers to tools for maintenance, application optimisation, energy efficiency and support, ProLiant servers help IT organisations increase application uptime and reduce operation costs for a fraction of the effort typically required of system administrators.

Guided by the "Client-2-Innovation" design philosophy, HP engineers and developers created over 150 innovations that help clients get tasks done simply, reliably and with confidence. Clients who have trusted ProLiant for years will be instantly familiar with the consistent experience and yet appreciate the attention to detail of the new features and design.

HP ProLiant servers with ProActive Insight architecture

Integrated Lifecycle Automation	Dynamic Workload Automation	Automated Energy Optimisation	Proactive Insight Experience
Servers so intelligent they eliminate tedious, time-consuming tasks	Servers so intelligent they converge storage, compute and I/O to turbo-charge application performance	Servers and infrastructure so intelligent they maximise use of space, power and cooling	Servers so intelligent they redefine the service experience
• **Intelligent Provisioning:** Fully integrated system and OS configuration tool eliminates 45% of the steps, so you can deploy servers 3x faster • **Active Health:** Troubleshoot 5x faster, monitor and log over 1,600 system parameters and 100% of configuration changes • **Smart Update Built-in:** Allows administrators to deploy updates 3x faster, with 93% less downtime during updates	• **Solid State Optimised:** For solid state to deliver a dynamic balance of 6x faster performance versus previous generations and capacity • **Smart Data Protection:** 50% more drive capacity, and 2x the number of drives in one RAID array, new multiple smart data protection technologies are now built in • **Smart Data Services:** Orchestrated with real-time analysis to build the future of converged storage	• **Thermal Discovery Services:** Reduce energy usage and increase compute capacity • **Location Discovery Services:** Optimise workload placement with servers that self-identify and inventory themselves • **Power Discovery Services:** Eliminates power configuration errors, precisely tracks power usage by rack and server by server, while eliminating manual record keeping	• **Insight Online:** The industry's first cloud-based, IT management and support portal • **Insight Remote Support:** 24/7 remote monitoring with automatic notification on potential hardware problems and accurate resolution in less time • **Proactive Services:** Innovative new services based on HP ProActive Insight architecture improves infrastructure uptime and performance
• Deploy servers quickly and easily to keep pace with business growth • Simplify the out-of-the-box experience – no physical media or downloads are needed for firmware, drivers, tools or agents • Reduce downtime with continuous monitoring of server health • Keep server firmware and software up to date with minimal operator intervention • Free server administrators to focus on strategic IT initiatives like cloud and virtualisation	• Increase storage capacity quickly and easily to stay ahead of data growth • Accelerate the performance of application workloads with increased memory bandwidth and faster data throughput • Protect data from hardware failures, application crashes and human errors • Improve uptime with advanced memory error detection • Scale capacity and performance in a cost-effective manner	• Reduce power consumption and operations costs • Squeeze more IT out of every bit of power and cooling capacity • Save valuable staff time by avoiding tedious analysis and discovery and inventory processes • Avoid datacentre outages by reducing the risk of power redundancy failures and circuit overloads • Reclaim datacentre capacity by optimising the use of power and cooling	• Save time managing IT infrastructure anytime, anywhere • Automate routine tasks to reduce costs and time spent troubleshooting • Prevent problems before they occur to keep business running smoothly • Simplify the support experience with automated 24/7 event monitoring and support case generation • Increase the availability of IT systems and business services with proactive notification of issues • Accelerate the resolution of problems and increase first time fix rate with HP remote support

HP ProLiant Gen8 E and P series models

e-Series Server Models (Essential)	p-Series Server Models (Performance)
Redefining essential and easy-to-use computing	The datacenter standard with leading performance and versatility
• **Right-Sized** I/O Bandwidth and memory • **Essential Storage** Performance • 1 GB **Embedded Ethernet** • Gold level 92% Power Efficiency • Industriy Leading Management wiht Insight Control[1] • Key Serviceability features • **3-1-1 Warranty** offering	• **Top Performance** with 2x I/O and memory • **Leading Storage** Performance • Most **Flexible** integrated **Networking** options • **Best Power Management** and 94% Efficiency[2] • Industriy Leading Management wiht Insight Control[3] • **Enhanced User Experience** and Serviceability • **3-3-3 Warranty** offering

[1] Insight Control is available on the e-Series rack servers only
[2] Intelligent Power Discovery Built-in
[3] Bundled on all Performance modelst

HP Qualified Options

Whether your customer is upgrading an existing ProLiant server or IT infrastructure, or buying a new HP ProLiant Gen8 server, HP offers a wide range of innovative and intelligent options and services.

A comprehensive, end-to-end portfolio of qualified smart options enables you to unleash the full potential of HP ProLiant servers and helps customise your solutions to drive business outcomes. The broad portfolio of HP ProLiant options covers the full range of customer needs – from the processor, to memory, hard drives, controllers and network interface controllers (NICs) – to the rack and power infrastructure and beyond.

These offerings are HP Qualified Options (HPQO) – which are tailored for HP ProLiant, Integrity and Storage systems – a designation that:

- Gives customers the confidence that the options have gone through a rigorous testing process
- Are easy to install, maintain and upgrade

With Gen8 of ProLiant servers, HP has introduced innovative Smart Storage and Memory technologies as well as game-changing ProLiant networking solutions. These solutions bring some significant new value for your customers by providing for significant increases in performance and power efficiencies.

For further information on the benefits of HP ProLiant options, visit:
www.hp.com/go/qualifiedoptions

HP Qualified Memory

HP provides the highest quality memory for HP servers and streamlines the warranty administration process. And HP ProLiant server memory is an HP Qualified Option, which means every genuine HP DIMM has been through our rigorous qualification process to ensure its compatibility, performance and reliability. In essence, customers who buy HP memory get additional value through reduced downtime, data reliability and increased productivity.

Gen8 ProLiant servers are optimised for dynamic workload acceleration and the Smart Memory significantly contributes to that. HP Smart Memory technology has enhanced data protection, significantly higher performance and error-handling intelligence for today's business speed and scale.

For more information on HP memory, please visit:
www.hp.com/products/memory

HP ProLiant Gen8 Smart Storage

Today's IT needs are facilitating the shift to a converged infrastructure to improve efficiencies and reducing complexity.

A key element of converged infrastructure is HP Smart Storage. It consists of the storage ecosystem including controllers, drives and disk enclosures and management applications. HP Smart Storage improves IT experience:

- Simplifies infrastructure management
- Reduces serviceability errors
- Enhances data availability
- Increases performance
- Increases storage density

HP Smart Storage is optimised for solid state technology to deliver a dynamic balance of performance and capacity.

With the introduction of ProLiant Gen8 servers, we are moving to a new hard drive – HP SmartDrive. This new drive allows for a significantly higher performance, easier management, increased capacity and reduced maintenance errors. Active Health data will allow faster issue resolution and clearer visibility to returns/failure modes.

With over 5 million SAS Smart Array controllers shipped, HP Smart Array controllers have delivered several innovations for protecting customer data, including the first RAID, first RAID 6/60, first Cache and first Flashback write cache. HP Gen8 Smart Arrays bring significant enhancement to performance, manageability and flexibility.

www.hp.com/products/harddiskdrives
www.hp.com/products/smartarray

HP Smart Array Advanced Pack

Deliver value-added software features for SAS Smart Array controllers which will further enhance the performance, reliability and availability of customer data.

HP ProLiant Gen8 Networking

HP's FlexNet Adaptors for ProLiant Gen8 bring some significant new value for our customers including increased performance, enhanced security, power management and flexibility. With Precision Time Control feature, customers can time stamp all communications so they know how long the traffic is taking to get to and from the business.

Some of the HP FlexNet Adaptors are Energy Efficient Ethernet, (EEE) compliant, thereby reducing the power consumption to significant levels.

Lastly for Gen8, we offer the flexibility of FlexLOM – a new and innovative way to handle server networking.

www.hp.com/servers/networking

HP SmartCache

- Controller-based read caching solution that accelerates workload performance by caching frequently accessed data ("hot data") on SSDs connected to the HP Smart Array controller.
- Integrates seamlessly into your datacenter, requiring no application or operating system changes.
- Manage your array and HP SmartCache through a common management tool – the HP Array Configuration Utility (ACU).

For more information please visit: www.hp.com/go/smartcache

HP hard-disk drives

	HP PCI-e Workload Accelerators			HP Enterprise SSDs				
Categories	**Performance**	**Mainstream**	**Value**	**Performance Drive form factor**	**Mainstream Drive form factor**	**Value Drive form factor**	**Boot Drive form factor**	
Connectivity	PCI-e	PCI-e / Mezz	PCI-e	6 GB SAS	6 GB SAS or 6/3 GB SATA	6/3 GB SATA	6 GB SATA	
Endurance (Drive Writes Per day)	High endurance ~25 DWPD	Mainstream endurance ~10 DWPD	Value endurance ~1 DWPD	High endurance ~25 DWPD	Mainstream endurance ~10 DWPD	Value endurance ~1 DWPD	Value endurance	
Capacities	350/700 GB	365/785 GB 1205/2410 GB / 3000 GB	1600 GB 3200 GB	200/400 GB	100/200/400/800 GB	100/200/400 GB and up	100 GB	
Typical Workloads	Applications that require lowest latency response times			Unrestricted read/ write applications	Mixed read/write applications	High read/low write applications	High-read/ Dynamic Throttled Write	

Enterprise Features: Full Datapath error detection, SmartSSD Wear Gauge support for SSDs, and typically with surprise power loss protection

HP Rack and Power solutions

HP Rack and Cooling Systems

	1000 mm Depth		1075 mm Depth		1200 mm Depth	
	Pallet	**Shock Pallet**	**Pallet**	**Shock Pallet**	**Pallet**	**Shock Pallet**
47U 600 mm wide			BW911A - HP Intelligent Rack	BW912A - HP Intelligent Rack BW936A - HP Intelligent Air Duct Rack	BW913A - HP Intelligent Rack	BW914A - HP Intelligent Rack
42U 600 mm wide	AF046A - HP v142 Rack		BW903A - HP Intelligent Rack	BW904A - HP Intelligent Rack BW910A - HP Intelligent Air Duct Rack BW966A - HP Intelligent Network Rack	BW907A - HP Intelligent Rack	BW908A - HP Intelligent Rack
42U 800 mm wide			BW917A - HP Intelligent Rack	BW918A - HP Intelligent Rack BW968A - HP Intelligent Network Rack	BW919A - HP Intelligent Rack	BW920A - HP Intelligent Rack
36U 600 mm wide			BW895A - HP Intelligent Rack	BW896A - HP Intelligent Rack	BW899A - HP Intelligent Rack	BW900A - HP Intelligent Rack
22U 600 mm wide	AF021A - HP 1000G2 Rack	AF022A - HP 1000G2 Rack				
14U 600 mm wide		292302-B22 - HP 1000G1 Rack				
Warranty	3-year HP warranty (3-0-0); HP Server and Storage hardware support. Covers rack and power products = "Integrated" Care Pack.* support.					
Information	For more information and detailed specs visit: www.hp.com/eur/rackandpower					
Feedback	For questions or support contact rackpowersolutions@hp.com					

HP KVM and IP Console Switches

	4 Ports	8 Ports	16 Ports	32 Ports
Workstation Console Switch	AF611A - HP 1x4 Console Switch			
Analogue Console Switch		AF616A - HP 0x2x8 Console Switch	AF617A - HP 0x2x16 Console Switch	
Analogue Console Switch + Virtual Media/CAC Support			AF618A - HP 0x2x16 Console Switch + VM/CAC Support	AF619A - HP 0x2x32 Console Switch - VM/CAC Support
Digital Console Switch + Virtual Media/CAC Support		AF620A - HP 1x1Ex8 IP Console Switch - VM/CAC Support	AF621A – HP 2x1Ex16 IP Console Switch - VM/CAC Support	AF622A - HP 4x1Ex32 IP Console Switch - VM/CAC Support
Warranty	3-year HP warranty (3-0-0); HP Server and Storage hardware support. Covers rack and power products = "Integrated" Care Pack support.*			
Information	For more information and detailed specs visit: www.hp.com/eur/rackandpower			
Feedback	For questions or support contact rackpowersolutions@hp.com			

HP Uninterruptible Power Supplies (UPSs)

	1-phase power input and output			3-phase power input and output		
	Product Number	**Power Output (VA/Watt)**	**Form Factor**	**Product Number**	**Power Output (VA/Watt)**	**Form Factor**
Tower	AF447A - HP T750 G2	750/500				
	AF449A - HP T1000 G3	1000/670				
	AF451A - HP T1500 G3	1500/950				
Tower & Rack	AF468A - HP R/T3000 G2	3300/3000	2U			
Rack	AF471A - HP R1500 G3	1500/1000	1U	AF432A - HP R8000/3	8000/8000	6U
	AF461A - HP R5000	5000/4500	3U	AF430A - HP R12000/3	12000/ 12000	6U
	AF463A - HP R7000	6300/6300	4U			
Parallel Rack				AF439A - HP RP36000/3	36 kVA/36 kW, exp. up to 60 kVA (n+1)	preconfigured in 42U Rack
Warranty	3-year HP warranty (3-0-0); HP Server and Storage hardware support. Covers rack and power products; = "Integrated" Care Pack support.* For HP RP36000/3 see Quickspecs					
Information	For more information and detailed specs visit: www.hp.com/eur/rackandpower					
Feedback	For questions or support contact rackpowersolutions@hp.com					

Power Distribution Units (PDU)

		1-Phase				3-Phase		
		16A - 3,6 kVA	**32A - 7,3 kVA**	**32A - 14,7 kVA**	**40A - 9,2 kVA**	**16A - 11 kVA**	**32A - 22 kVA**	
Intelligent PDU	**Core**		AF525A			AF526A	AF527A	
	Kit		AF534A					
Monitored PDU	**Core**		AF510A, AF915A (half height)	AF509A		AF508A	AF507A	AF917A (half height)
Modular PDU	**Core**		252663-B33		252663-B34	AF513A	AF518A	
	Kit	252663-B24	252663-B31		252663-B21 (Input hardwired) / 252663-B32			
Warranty		3-year HP warranty (3-0-0); HP Server and Storage hardware support. Covers rack and power products = "Integrated" Care Pack support.*						
Information		For more information and detailed specs visit: www.hp.com/eur/rackandpower						
Feedback		For questions or support contact rackpowersolutions@hp.com						

*"Integrated" Care Pack support. Cover all the options installed in your rack with a single convenient service package. HP Care Pack Services for rackmounted ProLiant DL servers, BladeSystem enclosures and storage include coverage for HP-branded rack options (rack consoles – TFT/keyboard, KVM switches), qualified UPSs (tower UPSs, rack UPSs not exceeding 12 kVA), and other qualified rack and power options (PDUs). These items are covered at the same service level and for the same period as the server, at no additional cost.

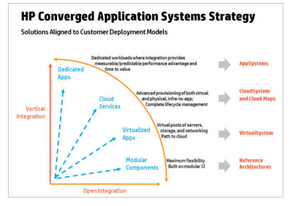
HP Converged Systems
Accelerate your IT to achieve better business results

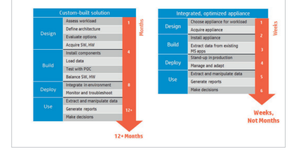
HP Converged Systems simplify and extend HP Converged Infrastructure by integrating hardware, software and services into turnkey solutions.

The HP Converged System portfolio includes HP VirtualSystem, HP CloudSystem, and HP AppSystems which are optimized for application delivery in virtualized, cloud and dedicated environments to:

- Accelerate time to application value
- Optimize application delivery and IT efficiency
- Eliminate islands of incompatible IT

HP Converged Systems deliver a systematic approach to optimize application performance and standardize IT operations across the data center with a common architecture, management and security model across the data center.





HP VirtualSystem

HP VirtualSystem solution simplifies and extends HP Converged Infrastructure into optimized server virtualization solutions for Microsoft Hyper-V®, Red Hat and VMware vSphere, delivering a complete, high-performance virtualized environment with pre-tuned server, storage, networking, and systems management.

HP VirtualSystem for Superdome 2 / HP-UX is specifically designed for mission-critical UNIX workloads and helps organizations achieve rapid deployment, reduced complexity, and advanced management of their most critical virtualized environments.

Client Virtualization

HP extends the VirtualSystem portfolio to enterprise client virtualization providing the fastest, path to agile and efficient virtualized solutions based on Citrix XenDesktop on Microsoft Hyper-V or VMware View.

More info on HP VirtualSystem:
www.hp.com/go/virtualsystem

HP AppSystems

HP has introduced AppSystems, a portfolio of integrated systems optimized to deliver maximum performance for dedicated business applications environments.

HP AppSystems are:

- Complete business application solutions, which enable proven turn-key deployments for faster time to application value.
- Single workload optimized to deliver exceptional quality of service for high productivity at lower TCO.
- Agile to leverage existing investments and rapidly scale to meet changing business needs.

Analytics

HP Business Decision Reference Architecture optimized for Microsoft SharePoint 2013 and SQL Server 2012 are used to deliver a Self Service, Business Intelligence Reference Architecture that empowers business users to access the analysis and decision making from months to days.

HP AppSystem for SAP In-Memory Appliance (SAP HANA) – An optimized system for processing massive quantities of real-time data in server memory for immediate results from analyses and transactions.

Data Management

HP AppSystems for data management help you improve data access, simplify and accelerate data capture and deliver a single version of the truth for accurate business decisions.

HP AppSystem for Microsoft SQL Server 2012 Parallel Data Warehouse is the industry's most scalable, highest performing and easiest-to-deploy data warehouse for SQL Server.

HP Business Data Warehouse Appliance optimized for Microsoft SQL Server Reduces the complexities and costs faced by many midmarket clients when deploying data warehouses, in a fast, affordable and easy to deploy solution.

HP Fast Track Data Warehouse for Microsoft – Data warehouse solutions for SQL Server based on HP Converged Infrastructure for predictable, consistent performance and the smallest footprint.

Online Transaction Processing and Database Consolidation

HP Database Consolidation Solution optimized for Microsoft SQL Server enables consolidation of thousands of transactional databases into a single, virtual environment to simplify database management with SQL server and reduce the cost of operations.

More info on HP AppSystems:
www.hp.com/go/appsystems

HP CloudSystem

As part of the HP Converged Cloud portfolio, HP CloudSystem enables enterprises and service providers to build and manage services across private, public and hybrid cloud environments on a simplified, integrated architecture:

- Industry's most complete, open and integrated system
- Single services view, supports multi-hypervisor, multi-OS, and heterogeneous infrastructures
- Intelligent automation and lifecycle management; application-to-infrastructure
- Built on proven and market-leading HP Converged Infrastructure and HP Cloud Service Automation

HP CloudSystem Matrix is an infrastructure as a service (IaaS) solution for private and hybrid cloud deployments: Virtual and physical infrastructure provisioning in minutes; deploy a robust on-premise cloud quickly; fast track delivery of cloud services with CloudStart service offering.

HP CloudSystem Enterprise builds full-scale deployments of private and hybrid cloud environments: Unify management of enterprise-grade application and infrastructure services; highly automated service lifecycle management; open and extensible architecture for increased agility.

HP CloudSystem Service Provider facilitates deployment of public and hosted private clouds that deliver complete service aggregation and management: aggregate cloud services for public or hosted private cloud, optimized for multi-tenancy, customer-unique portal experience, pre-integrated, but modular.

Get started with HP CloudSystem Matrix Software: For customers already taking advantage of virtualization and are ready to continue down the path to the cloud, the new CloudSystem Matrix software lets you build a cloud within a day, enabling you to create your service catalog. It provides a complete IaaS implementation for virtual environments with a service designer, a self-service portal for IT, and automated provisioning and capacity planning. This customer-installable software runs on any server supported by VMware and Microsoft Hyper-V, from HP or other vendors. A trial version is available for download.

More info on HP CloudSystem:
www.hp.com/go/cloudsystem
www.hp.com/go/tryCloudSystem

HP BladeSystem c-Class: the world's most advanced blade infrastructure just got better

The ever increasing business demand for instant access from anywhere to any service in real-time is driving the need for a highly virtualized and flexible environment. This will be built on a software defined data center that requires a converged infrastructure with embedded intelligence- that only HP can deliver. It starts with HP BladeSystem, the world's most advanced blade infrastructure with next generation technologies in a future-proof design. As the leading platform for virtualization and cloud, HP BladeSystem delivers breakthrough data center economics with the next generation networking for performance, scalable storage and intelligence for unprecedented insight into your data center.

IDC indicates in a survey that customers have been able to cut data costs by 68% using HP BladeSystem and pay back their initial investment in just over 7 months, a significant factor given the financial constraints most IT organizations are facing.

Access IDC white paper on www.hp.com/go/bladesroi

Next generation technologies in a future-proof design

The new HP BladeSystem c7000 Platinum enclosure delivers the **highest performance** including the fastest connectivity with 56 GB FDR Infiniband, 40 GB Ethernet for high performance, low-latency networking and 16 GB Fibre Channel-ready with superior scalability for storage.

The new 3R 24 GB RDIMM HP SmartMemory, designed for the HP ProLiant BL460c and BL660c Gen8 Server Blades, delivers greater capacity and a **25% increase in performance**[1] for new levels of scalability for tomorrow's virtualization needs.

The HP Mellanox SX1018 switch is the first to provide 40 GB downlinks[2] to each blade server enabling InfiniBand–like performance in an Ethernet blade switch. The world's fastest Ethernet blade switch from HP, another industry first the low-latency Ethernet switch delivers over **5X more bandwidth**[3] **and 4X faster application response time**[4].

Achieve up to 115.2 TB[5] of shared storage in a single enclosure with the next generation HP D2220sb Storage Blade, ideal for customers looking to move to virtualization. It has the flexibility to add cost-effective, high-density direct attached storage & can be easily upgraded to shared storage.

Infrastructure intelligence is an essential foundation for a software defined data center

HP Power Discovery, now available with the HP BladeSystem Platinum Enclosure, **automates power configuration and tracking to reduce unplanned downtime.** In addition, Location Discovery now allows customers to pin **point and track server and enclosure location remotely from your central console.** This new intelligence combines location with real-time, auto-populated power and thermal data, integrated within HP Insight Control, to automate many of the tedious, time consuming processes.

Now HP Virtual Connect builds on the wire-once simplicity with the new Virtual Connect 4.0 which adds intelligence to dyn**amically allocate underutilized bandwidth** ensuring customers achieve the highest return on their networking investment. HP Virtual Connect extends end-to-end integration with enterprise networking tools: **Priority Queue QoS**, enabling you to define the right service level for each application; and sFlow with real-time network monitoring for intelligent capacity planning. In addition, HP Virtual Connect continues to reduce costs by 47%[6] and simplifies your network by now converging your LAN and SAN at the aggregation layer with **Dual hop FCoE.**

Ultimate efficiency and performance for all your virtual clients

Today HP BladeSystem is the only blade infrastructure that can support a virtualized client solution and is architected for any workload from client to cloud. The result is breakthrough economics that **reduces costs up to 60%**[7], finally making it possible to mobilize your entire workforce.

The latest HP BladeSystem solution can scale from a task worker to a high-end workstation user, delivering a new level of user experience and productivity. In fact, HP BladeSystem is the first and only bladed infrastructure to enable workstation-class graphics performance. The new WS460c blade workstation is the first to provide multiple virtualized graphic cards with 8 GPUs per blade that delivers **4x more users per workstation blade server**[8]. This industry leading performance allows power users in industries like manufacturing, oil & gas, and finance to access their full desktop from any mobile device, anywhere, and anytime.

Additional information

www.hp.com/go/bladesystem
www.hp.com/go/virtualconnect
www.hp.com/partners/emea/virtualconnect

[1] Based on HP internal calculations as of Jan 2013. Compared with 3 DIMM per channel platforms with memory running at 1066 MHz vs HP 3R 24 GB DIMM at 1333 MHz.
[2] Based on HP analysis as of Jan 2013.
[3] Based on HP internal calculations as of Jan 2013. Compared to HP 6120XG with 240 GB of available up/down bandwidth vs Mellanox SX1018 1360 GB available up/down bandwidth to equal 5.6 times more up/down bandwidth.
[4] Based on HP internal calculation as of Jan 2013. Previous blade switch is a 1uS vs Mellanox SX1018 is 250nS 1000/250 for a total of 4x faster.
[5] Based on analysis as of Jan 2013. HP D2200sb storage blade allows up to 8 nodes per blade enclosure at 14.4 TB each, totalling 115.2 TB of internal bladed storage for a storage pool cluster within a HP Bladesystem.
[6] Based on HP internal calculations as of Jan 2013. The US ILP cost saving of Flex-10/10D as compared to FlexFabric.
[7] Based on HP internal calculations as of Jan 2013. Versus previous generation WS460c.
[8] Outfits up to 4X more NVIDIA Quadro 1000M graphics in the same HP c-Class enclosure space versus using WS460c Gen8 without expansion blade.

How to transform server economics with your ProLiant infrastructure

Managing today's server infrastructures has its challenges:

- **Utilisation: Are your administrators over- and your servers under-utilised?**
- **Agility: Are you under pressure to improve the responsiveness of your server infrastructure to meet the changing needs of your business?**
- **Power: Is your server infrastructure constrained by the amounts of power, cooling or space available in your datacentre?**
- **Deployment: Are you spending significant amounts of time to deploy your server infrastructure?**
- **Remote Management: Do you travel frequently to fix servers at remote sites?**

HP Insight Control

HP Insight Control is essential server management that enables you to fully utilize the management capability built into your HP ProLiant servers. Insight Control delivers powerful capabilities that allow you to proactively monitor ProLiant server health and performance (both physical and virtual), deploy ProLiant servers quickly, reduce energy costs, and control ProLiant servers from anywhere. As a result, you can reduce unplanned downtime and deliver stable IT services to your line-of-business (LOB) users. You can also respond to pressing business needs faster by facilitating the rapid rollout of new IT services and optimizing the utilization of compute resources and datacentre facilities.

Insight Control provides single-console integration with leading management applications. Insight Control for VMware® vCenter Server delivers powerful HP hardware management capabilities to virtualisation administrators without ever having to leave the vCenter console. HP Insight Control for Microsoft® System Center provides seamless integration of the unique ProLiant and BladeSystem manageability features into the Microsoft® System Center consoles. With these extensions, Insight Control allows you to maximise your investment in existing systems management tools.

With the introduction of the HP ProLiant Gen8 server portfolio, HP takes a big leap in embedded management, building on the legacy of HP iLO. HP introduces the HP iLO Management Engine, included as standard with every HP ProLiant Gen8 server from the ProLiant 100 Series to the very top of the line, across the complete range of BL, DL, ML and SL Series.

HP iLO Management Engine is an integral part of HP Insight end-to-end infrastructure management, which apart from the HP iLO Management Engine on the system board, consists of Insight Control on the central management server and Insight Online in "the cloud". Together and in any combination, these three pillars of our new, broader Insight Management strategy provide functionality for remote control, inventory collection, provisioning and deployment, maintenance and updates, health management, power & cooling and remote support.

With recently launched Insight Control 7.2, we have introduced our next generation for server provisioning capability called Insight Control server provisioning. This tool would be ideally suited for physical OS provisioning and server deployment in a multi server environment tool is needed and will take advantage of PXE free environment, for our Gen8 servers, thereby significantly simplifying deployment experience for our customers.

Consider just a few examples of savings in cost, risk, and people time, when you deploy ProLiant servers with Insight Control. The payback period when you invest in Insight Control is just 4.2 months with a 642% ROI.

- Reduce the cost of running your server infrastructure by up to €54,623.17 ($73,482) per 100 users over three years
- Increase server deployment speed twelve-fold (20 minutes vs 4 hours) and migration speed four-fold
- Reduce downtime by up to 83%. Eliminate server maintenance-related travel expenses
- Increase the capacity of your datacentre by up to three times with dynamic power capping

With Insight Management, you can get more from every hour, Watt and cent you invest in your ProLiant and BladeSystem infrastructure – physical and virtual. Instantly understand what's happening in your server infrastructure so you can make better informed decisions. Manage physical and virtual resources together, with greater simplicity, and accomplish more in less time. Continuously align your infrastructure to the needs of your business so that you deliver better service.

	iLO Essential	iLO Advanced	Insight Control[2]	Insight Online[3]
HP ProLiant Server Platforms	HP ProLiant Gen8 e-series	All HP ProLiant	All HP ProLiant	All HP ProLiant G2-Gen8
Service and Support Events				Yes[4]
Channel Partner Access				Yes
Contracts and Warranty Management				Yes
VMware® vCenter Server Intergration			Yes[5]	
Microsoft® System Center Intergration			Yes	
Virtual Machine Management			Yes	
Server Development			Yes	
Console Record, Replay		Yes	Yes	
Server Migration, Performance Management			Yes	
Virtual Serial Port Record, Replay, Remote Syslogs		Yes	Yes	
Advanced Power Management, Global Collaboration		Yes	Yes	
Health and Alerting		Yes	Yes	Yes[4]
Virtual Media, Folders, Keyboard, Video and Mouse	Yes	Yes	Yes	
HP iLO Management Engine[1]	Yes	Yes	Yes	

[1] HP iLO Management Engine, in all ProLiant Gen8 servers, includes: HP iLO (Mobile App., Sea of Sensors Thermal Management), HP Intelligent Provisioning, HP Agentless Management, HP Active Health System
[2] Windows CMS managed nodes
[3] Available with standard HP contract, warranty and HP Care Pack services in the HP Support Center Portal
[4] Available with latest version of Insight Remote Support and customer opt-in

Additional information

To find out more about how HP Insight Management can help you unlock the potential of your infrastructure, contact your local HP sales representative or authorised HP partner, or visit www.hp.com/go/insight

To see how other customers have benefited by implementing HP Insight Management, read the IDC white paper at www.hp.com/go/insightroi

HP Insight Management is an essential infrastructure management building block for developing a cloud environment, to learn more about HP's cloud solutions, visit www.hp.com/go/cloudsystem

To see demonstrations of HP Insight Management, visit the HP Solution Demo Portal at www.hp.com/go/insightswdemos and www.hp.com/go/cloudsystemdemos

HP Proactive Care Service

"I can no longer run my datacentre without putting in place cost-effective ways to avoid complex problems, and ensuring that any fix is going to be fast."

Customers running Industry Standard Servers are increasingly saying this to HP. Each year, more of them run businesses which would suffer in the event of a downtime. They are now looking for a way to protect their business with an entry-level proactive service. For that reason, HP introduced Proactive Care Service. It meets the needs of customers who want to take the first steps to protect a business that can no longer go unprotected.

Service benefits

Proactive Care helps customers to maximise return on their investment in a converged infrastructure with:

- Reduction of unplanned outages and other incidents
- Avoidance of problems caused by an infrastructure that is not at the current revision level
- Improved performance of systems which are configured consistently with HP best practices
- Accelerated resolution of those problems which do come up

What is HP Proactive Care Service?

HP Proactive Care Service (Proactive Care) offers an integrated set of proactive and reactive services designed to help improve the availability and performance of the converged infrastructure. In a complex environment, many components need to work together effectively. Proactive Care has been specifically designed to support these complex environments, providing an end-to-end environment support solution that covers servers, operating systems, hypervisors, storage, storage area networks (SANs) and networks.

A support team of HP specialists is equipped with remote technologies and tools designed to reduce downtime and increase productivity.

Key proactive deliverables from the support team include:

- Firmware release and software patching analysis and recommendations, to keep the IT environment is current and compatible
- A regular Proactive Scan of covered products which can help to uncover configuration, availability and security problems more proactively
- Quarterly incident reporting and analysis to help avoid repeat problems

Proactive Care requires the use of and is enabled by Insight Remote Support, a tool which monitors the customer's environment and provides ongoing views of the datacentre via a secure internet connection. Insight RS is customer-installable, and HP will provide assistance if required.

In the event of a service incident, Proactive Care provides direct access to a special group of technical solution specialists. They are poised to rapidly resolve critical issues. HP employs accelerated escalation procedures to resolve complex incidents. The service includes onsite hardware repair if it is required to resolve the issue. Customers choose from three hardware reactive support levels to meet their business and operational needs.

Clear Value

It's clear that Proactive Care helps customers avoid problems in the datacentre, and to connect quickly to experts who help resolve issues which do arise. Because HP provides the proactive deliverables remotely, HP is able to offer clear value at a very attractive price. HP Proactive Care is available for sale as a Care Pack, as well as contractually.

Scan to find out more
http://h18004.www1.hp.com/products/servers/platforms/

4AA3-7884EEE, Rev 2. Updated March 2013

Brochure

Next Generation ProLiant

Introducing the world's most self-sufficient servers

The ISS poster guide provides an insight into the HP ProLiant server portfolio and essential HP solutions to help manage and grow your business.

Entry-level

ProLiant series	MicroServer	DL160 Gen8	ML310e Gen8	DL320e Gen8	ML350e Gen8	DL360e Gen8	DL380e Gen8
Typical applications	Cost-effective starter server for businesses with fewer than ten clients, that will take your business to the next level of productivity and efficiency	High performance computing with enhanced management and networking	The essential 1P tower server for growing business which provides an affordable and steadfast solution to small and medium business who are budget conscious and who have no in-house IT resources	Perfect 1P design for single-application server and infrastructure server for standalone as well as datacentre with flexibility on IT expense	Designed for remote to medium businesses that are looking for expandable standalone tower server with enterprise-level performance and system management	Enhanced management, sleek design, and exceptional serviceability bundled with essential features makes the DL360e Gen8 the right choice for value enterprise and SMB customers alike	With enhanced storage performance, serviceability, and management capabilities, the DL380e Gen8 is a perfect match for customers looking for great value and essential features
Processors Additional processor models are available on request. Please check the product QuickSpecs for more details	1 x AMD Turion™ II Neo N54L (2.2 GHz, 15 W, 2 MB)	Up to 2 Intel® Xeon® E5-2600 series (2/4/6/8 core) processors - models: E5-2603, E5-2620, E5-2640	Intel® Xeon® E3-1200v2 and Intel® Core™ i3-3200 series (2/4 core) processors - models: i3:3220, E3-1220v2, E3-1240v2	Intel® Xeon® E3-1200v2, Intel® Core and Pentium series (2/4 core) processors - models: G2120, E3-1220v2, E3-1240v2	Up to 2 Intel® Xeon® E5-2400 series (4/6/8 core) processors - models: E5-2403, E5-2407, E5-2420	Up to 2 Intel® Xeon® E5-2400 series (4/6/8 core) processors- models: E5-2403, E5-2407, E5-2430	Up to 2 Intel® Xeon® E5-2400 series (4/6/8 core) processors - models: E5-2403, E5-2407, E5-2420, E5-2450
Form factor	Ultra Micro Tower (no rackmount capability)	Rack (1U)	Micro ATX Tower (4U)	Rack (1U)	Tower (5U)	Rack (1U)	Rack (2U)
Memory (standard/maximum)	2 DIMM sockets, 1 GB, 2 GB and 4 GB up to 8 GB max. (2 x 4 GB) unbuffered ECC DDR3 1066/1333 MHz	4 GB, 8 GB or 16 GB DDR3 RDIMMs/max. 384 GB with RDIMMs, 768 GB with LRDIMMS or 128 GB with UDIMMs	2 GB, 4 GB or 8 GB DDR3 UDIMMs/max. 32 GB	2 GB, 4 GB or 8 GB DDR3 UDIMMs/max. 32 GB	4 GB, 8 GB or 16 GB DDR3 RDIMMs/max. 192 GB with RDIMMs or 2 GB, 4 GB and 8 GB/max. 96 GB with UDIMMs	4 GB, 8 GB 16 GB, or 32 GB DDR3 RDIMMs/ max. 384 GB with RDIMMs or 2 GB, 4 GB and 8 GB/max. 96 GB with UDIMMs	4 GB, 8 GB 16 GB, or 32 GB DDR3 RDIMMs/ max. 384 GB with RDIMMs or 2 GB, 4 GB and 8 GB/max. 96 GB with UDIMMs
I/O slots	**2 total:** (1) PCI-e x 16, (1) PCI-e x 4	**2 total:** (1) PCI-e x 16 Gen 3 (FH/FL) ; (1) 1 low-profile PCI-e x 8 (internal) Gen 3	**4 total:** (1) PCI-e 3.0 x 16 FL/FH (1) PCI-e 3.0 x 8 FL/FH (1) PCI-e 2.0 x 8 FL/FH (1) PCI-e 2.0 x 4 HL/FH	**2 total PCI-e 3.0:** (1) x 16 HL/FH (1) x 8 low profile	**6 total:** (2) PCI-e 3.0 x 16 FL/FH (1) PCI-e 3.0 x 8 FL/FH (1) PCI-e 3.0 x 4 FL/FH (1) PCI-e 2.0 x 4 (FL/HH) (1) PCI-e 2.0 x 1 HL/FH	**2 total:** (1) PCI-e 3.0 x 16 FH/HL (1) PCI-e 2.0 x 8 low profile	**Up to 6 total** PCI-e 3.0: Riser 1: (1) x 16 FL/FH; (1) x 8 HL/FH; (1) x 8 HL/FH; (1) PCI-e 2.0 x 4 low profile; Riser 2: PCI-e 3.0: (1) x 16 FL/FH; (1) x 16 HL/FH
Storage controller	Integrated SATA controller with embedded RAID (0, 1)	HP Dynamic Smart Array B120i Controller (RAID 0/1/10); Perf Models : Smart Array P420 / 1 GB FBWC Controller	HP Dynamic Smart Array B120i SATA Controller with optional P420 performance array controller	HP Dynamic Smart Array B120i SATA Controller or SA P222 Storage Controller with 512 MB FBWC	HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10) with 512 MB FBWC (RAID 0,1, 5, 10) or HP Smart Array P410i/1 GB FBWC (RAID 0/1/1+0/5/5+0)	HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10), B320i or P420 (RAID 0/1/1+0/5/5+0)	HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10), B320i or P420 (RAID 0/1/1+0/5/5+0)
Storage (maximum)	Pluggable max. 8 TB LFF SATA (4 x 2 TB)	12 TB LFF Hot Plug SAS/ SATA; 8 TB SFF Hot Plug	12 TB (4 x 3 TB) 3.5 LFF; 8 TB (8 x 1 TB) 2.5 SFF. Support for 400 GB SSD (4 x 100 GB)	12 TB (4 x 3 TB) 3.5 LFF; 8 TB (8 x 1 TB) 2.5 SFF. Support for 400 GB SSD (4 x 100 GB)	24 TB SATA 2.5 SFF (24 x 1 TB) with optional drive cages – 8 drives standard 54 TB SATA LFF (18 x 3 TB) with optional drive cages. Support for 19.2 TB SSD (24 x 400 GB)	12 TB (8) SFF Hot Plug bays (4) LFF Hot Plug bays. Support for 6.4 TB SSD (8 x 800 GB)	27 TB SAS; 42 TB SATA. 8 SFF Hot Plug bays (standard). Optional (25+2) SFF Hot Plug bays Optional (8 or 12+4) LFF Hot Plug bays. Support for 21.6 TB SSD (27 x 800 GB)
Optical drive support	Optional DVD or DVD-RW	Optional	Optional	DVD-ROM or DVD-RW	Optional	Optional	Optional
Network interface controller	Embedded NC107i PCI-e GB Ethernet Server Adapter	HP NC361i Integrated Dual Port Gigabit Server Adapter ; optional FlexLOM slot	HP Ethernet 1 GB 2-port 330i Adapter	HP Ethernet 1 GB 2-port 330i Adapter	HP Ethernet 1 GB 2-port 361i Adapter	HP Ethernet 1 GB 4-port 366i Adapter	HP Ethernet 1 GB 4-port 366i Adapter
USB support	**7 total + e-SATA:** 4 front, 2 rear, 1 internal + 1 eSATA rear	**7 total:** 2 front, 4 rear and 1 internal	**10 total:** 4 front, 4 rear, 2 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal	**10 total:** 4 front, 4 rear, 2 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal; + 1 internal SD slot
Redundant power supply	No	No	Yes	Yes	No	Yes	Yes
Redundant fans	No	Yes	No	Yes	No	Yes	Yes
Infrastructure Management	HP MicroServer Remote Access Card (standard)	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control
Warranty (P - parts, L - labour, NBD - next business day onsite)	1-yr P, 0-yr L, 0-yr NBD	3-yr P, 0-yr L, 0-yr NBD	3-yr P, 1-yr L, 1-yr NBD	3-yr P, 1-yr L, 1-yr NBD	3-yr P, 1-yr L, 1-yr NBD	3-yr P, 1-yr L, 1-yr NBD	3-yr P, 1-yr L, 1-yr NBD
Support	**Proactive Care 3-year 24/7, 4-hour response**						
	n/a	U3A18E	U6F73E	U6F03E	U6C93E	U6D63E	U6G61E
	Installation and Startup Service						
	n/a	U9520E	U4457E	U4491E	U4523E	U4507E	U4555E

Mid-range

ProLiant series	ML350p Gen8	DL360p Gen8	DL380p Gen8	DL385p Gen8	DL560 Gen8	DL580 G7	DL585 G7	DL980 G7
Typical applications	Maximum enterprise class performance and expansion in a tower or rack form factor	Performance driven compute with storage density - ideal for enterprise applications. Industry leading performance, efficiency, capacity and reliability. Enterprise enhanced design for all workloads with versatility for future requirements	Setting the next generation standards of 2U 2-socket rack servers for the industry. With enhanced configuration flexibility, unmatched performance, and leading energy efficient design the DL380p Gen8 offers the perfect solution for the dynamic compute requirements of today's demanding datacentres	The DL385p Gen8 is the price/performance choice for your virtualisation, database, and high performance computing workloads	The DL560 Gen8 is a new server that offers the ideal 4S dense form factor without compromising on performance, scalability, and expandability	The enterprise standard for business critical workloads	Versatile workhorse for the evolving datacentre	UNIX migration initiatives that require the utmost resiliency in an x86 environment Largest, most resource-intensive workloads (business processing, decision support, OLTP)
Processors	Up to 2 Intel® Xeon® E5-2600 series (2/4/6/8 core) processors - models: E5-2650, E5-2640, E5-2630, E5-2620, E5-2609	Up to 2 Intel® Xeon® E5-2600 series (2/4/6/8 core) processors - models: E5-2603, E5-2630, E5-2640, E5-2650, E5-2690	Up to 2 Intel® Xeon® E5-2600 series (2/4/6/8 core) processors - models: E5-2609, E5-2620, E5-2630, E5-2640, E5-2650, E5-2665, E5-2690	Up to 2 AMD Opteron™ 6300 series (4/8/12/16 core) processors - models: 6320, 6344, 6376	Up to 4 Intel® Xeon® E5-4600 series (4/6/8 core) processors - models: E5-4603, E5-4610, E5-4640	Up to 4 Intel® Xeon® E7 series processors - models: 4870 (10 core), 4850 (10 core), 4830 (8 core), 4807 (6 core)	Up to 4 AMD Opteron 6200 or 6300 series processors (4/8/12/16 core) – Models 6282SE, 6276, 6272, 6238, 6386SE, 6380, 6376	Four or Eight of the following processors depending on model
Form factor	Tower and Rack (5U)	Rack (1U)	Rack (2U)	Rack (2U)	Rack(2U)	Rack (4U)	Rack (4U)	Rack (8U = 14)
Memory (standard/maximum)	4 GB, 8 GB, 16 GB or 32 GB DDR3 RDIMMs/ max. 768 GB with RDIMMs or 2 GB, 4 GB and 8 GB/max. 96 GB with UDIMMs	8 GB, 16 GB or 32 GB DDR3/ max. 768 GB with LRDIMMs or 96 GB with UDIMMs	4 GB, 8 GB, 16 GB or 32 GB DDR3/max. 768 GB with LRDIMMs or 128 GB with UDIMMs	4 GB, 8 GB 16 GB, or 32 GB DDR3 RDIMMs, ULVDIMMs or LRDIMM max. 768 GB with RDIMMs	16 GB, 32 GB or 64 GB DDRs RDIMMs/max. 1.5 TB DDR3 RDIMM/LRDIMM	Up to 2 TB (64 DIMMs) – 64 or 128 GB models Standard Registered DDR3 (1333) RDIMM	Up to 1.5 TB (48 DIMMs) – 32/64 and 128 GB models Standard Registered DDR3 (1066/1333/800 RDIMMs)	Up to 4 TB RAM. HP 2 GB (1 x 2 GB) Dual Rank x 8 PC3-10600 (DDR3-1333), 4 GB (1 x 4 GB) Single Rank x 4 PC3L-10600 (DDR3-1333), 8 GB (1 x 8 GB) Dual Rank x 4 PC3L-10600 (DDR3-1333), 16 GB (1 x 16 GB) Dual Rank x 4 PC3L-10600 (DDR3-1333), 32 GB (1 x 32 GB) Quad Rank x 4 PC3L-8500R-7 (DDR3-1333) Registered CAS-9 LP Memory Kit
I/O slots	**9 total:** (3) PCI-e 3.0 x 16 FL/FH (1) PCI-e 3.0 x 8 FL/FH (4) PCI-e 3.0 x 4 FL/FH (1) PCI-e 2.0 x 4 HL/FH	**2 total:** PCI-e 3.0: (1) x 16 HL/FH + (1) x 8 low profile	**Up to 6 total:** PCI-e 3.0: Riser 1: (1) x 16 FL/FH; (1) x 8 HL/FH; (1) PCI-e 2.0 x4 HL/FH; Riser 2: (1) x 16 FL/FH; (2) x 8 HL/FH	**Up to 6 total:** PCI-e 2.0: Riser 1: (1) x 8 FL/FH (1) x 8 HL/FH (1) x 4 HL/FH Riser 2: (1) x 16 FL/FH (2) x 8 HL/FH	**Up to 6 total:** PCI-e 3.0: Riser 1: (1) x 16 FL/FH; (1) x 8 HL/FH; (1) PCI-e 2.0 x 4 HL/FH; Riser 2: (1) x 16 FL/FH; (1) x 16 HL/FH; (1) x 8 HL/FH; Riser 2 : (1) x 16 FL/FH; (1) x 16 HL/FH	**Up to 11 total slots:** (Standard + Optional card) 5 embedded Standard I/O slots: (3) PCI-e Gen 2 x 4 (FH/FL) (2) PCI-e Gen 2 x 8 (FH/FL) Optional mezzanine cards (all FH/FL) PCI-e I/O 6-slot expansion (4) PCI-e Gen 2 x 8 + (1) PCI-e Gen 2 x 4 + (1) PCI-e Gen 1 x 4 or combo PCI-e/PCI-X expansion (2) PCI-e Gen 2 x 16 + (1) PCI-e Gen 2 x 4 + (2) PCI-X	**Up to 11 total slots:** (Standard + Optional card) 5 embedded Standard I/O slots: (3) PCI-e Gen 2 x 8 (FH/FL) (2) PCI-e Gen 2 x 16 (FH/FL) Optional mezzanine cards (all FH/FL) PCI-e I/O 6-slot expansion (4) PCI-e Gen 2 x 8 + (2) PCI-e Gen 2 x 16 or combo PCI-e/PCI-X expansion (1) PCI-e Gen 2 x 16 + (2) PCI-e Gen 2 x 8 + (1) PCI-e Gen 2 x 4 + (2) PCI-X	**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 x 8, 3 PCI-e x 4. Optional full height/full length I/O backplanes - (choose only one): 2 PCI-e 2.0 x 16, 1 PCI-e 2.0 x 4, 2 PCI-X OR 4 PCI-e 2.0 x 8, 1 PCI-e 2.0 x 4, 1 PCI-e 1.1 x 4. Optional low profile I/O backplane: 4 PCI-e 2.0 x 8, 1 PCI-e 2.0 x 4
Storage controller	Smart Array P420i performance array controller with options to 2G FBWC	Smart Array P420i performance array controller with options to 2G FBWC	Smart Array P420i performance array controller with options to 2G FBWC	Smart Array P420i performance array controller with options to 2G FBWC	Smart Array P420i performance array controller	HP Smart Array P410i controller	HP Smart Array P410i 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.
Storage (maximum)	24 TB SATA 2.5 SFF (24 x 1 TB) with optional drive cages – 8 drives standard 54 TB SATA LFF (18 x 3 TB) with optional drive cages. Support for 19.2 TB SSD (24 x 400 GB)	8 TB (8) SFF Hot Plug bays (standard). Optional (10) SFF Hot Plug bays Optional (4) LFF Hot Plug bays. Support for 6.4 TB SSD (8 x 800 GB)	25 TB SAS; 36 TB SATA; 8 SFF Hot Plug bays (standard) - Optional 25 SFF Hot Plug bays, 8 or 12 LFF Hot Plug bays. Support for 20 TB SSD (25 x 800 GB)	25 TB SAS; 36 TB SATA. 8 SFF Hot Plug bays (standard). Optional (25) SFF Hot Plug bays Optional (8 or 12) LFF Hot Plug bays. Support for 20 TB SSD (25 x 800 GB)	5 TB SAS or 1.6 TB SSD SFF Hot Plug bays	8 TB SAS/SATA 2.5 SFF (8 x 1 TB)	8 TB SAS/SATA 2.5 SFF (8 x 1 TB)	Hot Plug SFF SAS 7.2 TB 8 x 900 GB or Hot Plug SFF SAS SSD 3.2 TB 8 x 400 GB
Optical drive support	Optional	Optional	Optional	Optional (not available on some models-drive cage dependant)	Optional	Optional	Optional	Slimline DVD-RW Drive standard
Network interface controller	HP Ethernet 1 GB 4-port 331i Adapter (optional: dual-port 10 GbE)	HP Ethernet 1 GB 4-port Adapter (FlexibleLOM). Optional: FlexibleLOM available for 10 GbE, CNA, SFP+ and IB	1) HP Ethernet 1 GB 4-port Adapter (FlexibleLOM). Optional: FlexibleLOM available for 10 GbE, CNA, SFP+ and IB	1) HP Ethernet 1 GB 4-port Adapter (FlexibleLOM). Optional: FlexibleLOM available for 10 GbE, CNA, SFP+ and IB	1) HP Ethernet 1 Gb 4-port Adapter (FlexibleLOM); optional FlexibleLOM 10 GbE upgrade	NC375i quad-port 1 GbE multi-function NIC; optional dual-port 10 GbE upgrade or NC331i quad Port 1 GB Adaptor (depending on model)	NC375i quad-port 1 GbE multi-function NIC; optional dual-port 10 GbE upgrade or NC331i quad Port 1 GB Adaptor (depending on model)	Network RJ-45 4
USB support	**10 total:** 4 front, 4 rear, 2 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal; + 1 internal SD slot	**8 total:** 2 front, 4 rear, 2 internal; + 1 internal SD slot	**7 total:** 2 front, 4 rear, 1 internal; + 1 internal SD slot	**6 total:** 2 front, 2 rear, 2 internal; + 1 internal SD slot	**6 total:** 2 front, 2 rear, 2 internal; + 1 internal SD slot	**6 total:** 2 front (video); 2 rear (video, NIC); 2 internal[1]
Redundant power supply	Yes	Yes	Yes	Yes	Yes	**4 total:** 2 + 2 redundant; 4 ship standard in 4P models, 2 ship standard in 2P models	**4 total:** 2 + 2 redundant; 4 ship standard in 4P models, 2 ship standard in 2P models	Rear accessible Hot Plug Power Supplies with option for redundancy (Redundant power supplies are standard on some models).
Redundant fans	Yes	Yes	Yes	Yes	Hot Plug Redundant Fans (standard)	Hot Plug Redundant Fans (standard)	Hot Plug Redundant Fans (standard)	8 Hot plug, redundant fans ship standard
Infrastructure Management	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	Integrated Lights-Out 3 (iLO 3), Insight Control	Integrated Lights-Out 3 (iLO 3), Insight Control	Integrated Lights-Out 3 (iLO 3), Insight Control
Warranty (P - parts, L - labour, NBD - next business day onsite)	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD
Support	**Proactive Care 3-year 24/7, 4-hour response**							
	U3A78E	U2Z86E	U2Z50E	U2Z50E	U6H10E	U2Z68E	U2Z68E	U3Q06E
	Installation and Startup Service							
	U4523E	U4507E	U4555E	U4555E	U6H60E	U4618E	U4618E	UM451E

[1]Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html

c-Class workstation blade / c-Class server blades

ProLiant series	WS460c Gen8	BL420c Gen8	BL460c Gen8	BL465c Gen8	BL620c G7	BL660c Gen8	BL680c G7	BL685c G7
Typical applications	Multi-display hardware accelerated graphics performance for 2D, 3D and streaming video applications	Break Through Server Blade Economics for Essential Enterprise Workloads - With enhanced features such as hot-plug drives, smart array choices , an array of networking choices via FlexibleLOMs, increased memory and I/O speeds, the BL420c Gen8 redefines the term "entry-level" in the blade market. It spans everything from single applications and small deployments to essential enterprise workloads, making it ideal for mid-market and cost-sensitive enterprise customers	The BL460c Gen8 is designed for a very wide variety of mainstream business to HPC scale-out apps for small, medium and enterprise datacentres. Key workloads include virtualisation, IT infrastructure (file and print, networking, security, systems mgmt), web infrastructure (web serving, streaming media) and collaborative (e-mail, workgroup)	The first server blade to deliver over 2,000 cores per rack - With enhanced innovations in performance, flexibility in networking options, and robust management features, the BL465c Gen8 is the price/ performance choice for virtualisation, database, and high performance computing workloads	The world's most scalable 2P, single-wide, full-height server in a single full-height blade provides virtualisation efficiency for larger consolidation projects and a variety of demanding data-intensive workloads. It is also perfect for 2P applications requiring performance and features greater than typical dual-processor (DP) Intel® Xeon® 5500/6500 offerings	Redefining density-optimized 4S blade technology - The BL660c Gen8 is a new server blade that offers the ideal 4-socket dense form factor without compromising on performance, scalability, and expandability	Ideal for 4P rack to blade transition, large virtualisation (VMware, Citrix, XenServer etc.), large databases (Oracle®, SQL, IBM Information Mgmt etc.), ERP (SAP etc.), HRM and CRM (PeopleSoft, Siebel, JDE etc.), terminal services (Citrix XenApp etc.), large e-commerce (WebSphere, BEA, Java etc.), electronic design automation (EDA), and other very data-demanding applications	Ideal for virtualisation, multi-tiered enterprise applications such as SAP, PeopleSoft, Siebel, Oracle® and JDE, server consolidation, large database applications, ERP, CRM, mail and messaging, business integration applications, EDA, petrochemical, life sciences and material sciences
Processors	Up to 2 Intel® Xeon® E5-2600 series (4/6/8 core) processors - models: E5-2637, E5-2620, E5-2630, E5-2640, E5-2650, E5-2660, E5-2665, E5-2667, E5-2670, E5-2680; Low power models: E5-2630L, E5-2650L	Up to 2 Intel® Xeon® E5-2400 series (4/6/8 core) processors: Models: E5-2450, E5-2430, E5-2403 Low power Model: E5-2450L	Up to 2 Intel® Xeon® E5-2600 series (4/6/8 core) processors: Models: E5-2609, E5-2620, E5-2640, E5-2650, E5-2660, E5-2670 Low power: Model: E5-2650L	Up to 2 AMD Opteron™ 6200 / 6300 Series (4/8/12/16 core) processors: Models: 6380, 6344, 6328, 6276, 6272, 6238	1 or 2 Intel® Xeon® series (8/10 core) processors: Models: E7-2830, E7-2850, E7-2860	Up to 4 Intel® Xeon® E5-4600 series (4/6/8 core) processors: E5-4650, E5-4620, E5-4617	2, 3 or 4 Intel® Xeon® series (8/10 core) processors: Models: E7-4830, E7-4850, E7-4860	Up to 4 AMD Opteron™ series (8/12/16 core) processors: Models: 6380, 6276, 6344, 6238, 6328
Form factor	16 workstations blades or 8 workstations paired with 8 Graphics Expansion Blades in a 10U C7000 enclosure. 8 workstations blades or 4 workstations paired with 4 Graphics Expansion Blades in a 6U C3000 enclosure.	16 server blades in 10U (c7000 enclosure) or 8 blades in 6U (c3000 enclosure)	16 server blades in 10U (c7000 enclosure) or 8 blades in 6U (c3000 enclosure)	16 server blades in 10U (c7000 enclosure) or 8 blades in 6U (c3000 enclosure)	8 blades in 10U (c7000) or 4 blades in 6U (c3000)	8 blades in 10U (c7000) or 4 blades in 6U (c3000)	4 blades in 10U (c7000) or 2 blades in 6U (c3000)	8 blades in 10U (c7000) or 4 blades in 6U (c3000)
Memory (standard/maximum)	RDIMM 8 x 8 GB DDR3 1600 MHz 4 x 8 GB DDR3 1600 MHz 4 x 8 GB DDR3 1333 MHz 4 x 4 GB DDR3 1333 MHz Max. 16 x 16 GB 1600 MHz 16 x 16 GB 1333 MHz UDIMM Max. 16 x 8 GB 1333 MHz LRDIMM Max. 16 x 32 GB 1333 MHz	12 GB/192 GB PC3L-12800R (DDR3-1600) RDIMM; 384 GB PC3L-10600L (DDR3-1333) LRDIMM; 96 GB PC3L-10600E (DDR3-1333) UDIMM; 12 DIMM slots	16 GB/384 GB PC3-12800 (DDR3-1600) RDIMM; 512 GB PC3L10600 (DDR3-1333) LRDIMM; 128 GB PC3L10600 (DDR3-1333) UDIMM; 16 DIMM slots	16 GB/256 GB PC3L-10600R (DDR3-1333)/ PC3-12800R (DDR3-1600) RDIMM; 32 GB/ 512 GB PC3L-10600L (DDR3-1333) LRDIMM; 16 DIMM slots	32 GB/1 TB; 8 GB/512 GB PC3-10600 (DDR3-1333) or PC3-8500 (DDR3-1066) RDIMMs; 32 DIMM slots to 1 TB	128 GB/512 GB PC3-12800R (DDR3-1600); 128 GB/512 GB PC3L-10600R (DDR3-1333) RDIMM; 32 GB/1 TB PC3L-10600L (DDR3-1333); 32 DIMM Slots	64 GB/2 TB PC3-10600 (DDR3-1333) or PC3-8500 (DDR3-1066); 64 DIMM slots to 2 TB	64 or 32 GB/1 TB PC3-10600 DDR3 RDIMMs; 32 DIMM slots
I/O slots	Mezzanine I/O expansion slots (x16 PCI-e 3.0). Dual-port 10 GB FlexFabric and 10 GB Flex-10. Dual-port 8 GB Fibre Channel HBA QDR and FDR InfiniBand. Graphics support: NVIDIA Quadro 500m (single / dual), Quadro 1000m (single / up to 8), Quadro 3000m (single / up to 6). With Graphics Exp.Blade: Multi GPU graphics Carrier NVIDIA Q4000, Q5000, Q6000 and M2070Q. ATI FS9350	2 PCI Gen 3 I/O expansion mezzanine slots (1x8; 1x16): 1 GbE, 10 GB Flex-10, 10 GB FlexFabric, 8 GB Fibre Channel, QDR & FDR InfiniBand, I/O accelerator	2 (2x16) PCI Gen 3 I/O expansion mezzanine slots: 1 GbE, 10 GB Flex-10, 10 GB FlexFabric, 8 GB Fibre Channel, QDR & FDR InfiniBand, I/O accelerator	2 PCI Gen 2 I/O expansion mezzanine slots (1x8; 1x16): 1 GbE, 10 GB Flex-10, 10 GB FlexFabric, 8 GB Fibre Channel, QDR & FDR InfiniBand, I/O accelerator	3 mezzanine I/O expansion slots: for 1 GbE, 10 GbE, 10 GbE Flex-10, 10 GB FlexFabric, 4 GB and 8 GB Fibre Channel, iSCSI initiator, QDR (40 GB/s) InfiniBand, I/O accelerator, Smart Array, and PCI-e Mezzanine Pass-Thru adapters	3 mezzanine I/O expansion slots: for 1 GbE, 10 GbE, 10 GB Flex-10, 10 GB FlexFabric, 8 GB Fibre Channel adapters, QDR & FDR Infiniband, I/O accelerator	7 mezzanine I/O expansion slots: one dedicated to a dual-port LAN adapter including 1 GbE, 10 GbE, 10 GbE Flex-10, and 10 GB FlexFabric and the remaining six general purpose for 1 GbE, 10 GbE, 10 GbE Flex-10, 10 GB FlexFabric, 4 GB and 8 GB Fibre Channel, iSCSI initiator, QDR (40 GB/s) InfiniBand, I/O accelerator, and Smart Array adapters	3 mezzanine I/O expansion slots: for 1 GB, 10 GB and Flex-10/ FlexFabric FCoE capable 10 GB Ethernet adapters, iSCSI adapters, 4 GB and 8 GB Fibre Channel adapters and 4 x QDR (40 GB/s) Infiniband adapters
Storage controller	Embedded Smart Array P220i controller with RAID (0/1) capability, 512 MB flash cache and battery retention ready	HP Smart Array P220i controller with RAID (0/1) capability, 512 MB FBWC and battery retention ready; Dynamic Smart Array B320i controller with SAS license key for RAID (0/1)	Embedded HP Smart Array P220i controller with RAID (0/1) capability, 512 MB flash cache	Embedded HP Smart Array P220i controller with RAID (0/1) capability, 512 MB flash cache	Embedded 6 G SAS version 2.0 P410i controller with RAID 0 and 1. Options include P410i 512 MB and 1 GB flash-backed write cache; I/O accelerator cards; Smart Array Advanced Pack	Embedded HP Smart Array P220i controller with RAID (0/1) capability, 512 MB FBWC cache	Embedded 6 G SAS version 2.0 P410i controller with RAID 0, 1, 1+0. Options include 512 MB and 1 GB flash-backed write cache and Smart Array Advanced Pack; I/O accelerator cards; Smart Array RAID mezzanine controllers for external storage	Smart Array P410i 1 GB FBWC
Storage (maximum)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 1.6 TB SFF SAS SSD (2 x 800 GB)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 1.6 TB SFF SAS SSD (2 x 800 GB) 800 GB SFF SATA SSD (2 x 400 GB)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 1.6 TB SFF SAS SSD (2 x 800 GB) 800 GB SFF SATA SSD (2 x 400 GB)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 1.6 TB SFF SAS SSD (2 x 800 GB) 800 GB SFF SATA SSD (2 x 400 GB)	Hot Plug: 2 TB SAS (2 x 1 TB) 2 TB SATA (2 x 1 TB) 1.6 TB SAS SSD (2 x 800 GB) 800 GB SATA SSD (2 x 400 GB)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 1.6 TB SFF SAS SSD (2 x 800 GB)	Hot Plug: 4 TB SAS (4 x 1 TB) 4 TB SATA (4 x 1 TB) 3.2 TB SAS SSD (4 x 8 GB) 1.6 TB (4 x 400 GB)	Hot Plug: 2 TB SFF SAS (2 x 1 TB) 2 TB SFF SATA (2 x 1 TB) 800 GB SFF SATA SSD (2 x 400 GB)
Optical drive support	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure
Network interface controller	One (1) HP Flex-10 10 GB 2-port 530 FlexibleLOM Standard iLO Network Controller: One (1) 10/100 Mbps port for the HP iLO 4 On System Management Chipset	Dual-port FlexibleLOM for choice of 10 GB FlexFabric, 10 GB Flex-10, 10 GB Ethernet, or 1 GB Ethernet	Dual-port FlexibleLOM for choice of 10 GB FlexFabric, 10 GB Flex-10, 10 GB Ethernet	Dual-port FlexibleLOM for choice of 10 GB FlexFabric, 10 GB Flex-10, 10 GB Ethernet	Four embedded NC553i 10 GB FlexFabric converged network adapter ports with FCoE/Ethernet/iSCSI/Flex-10/TOE; dedicated 10/100 adapter for iLO3	2 Dual-port FlexibleLOM for choice of 10 GB FlexFabric, 10 GB Flex-10, 10 GB Ethernet	Six embedded NC553i 10 GB FlexFabric converged network adapter ports with FCoE/Ethernet/iSCSI/Flex-10/TOE; dedicated 10/100 adapter for iLO3	Two embedded NC550i dual-port FlexFabric 10 GB converged network adapters (CNA) Ethernet/iSCSI/Flex-10/ FCoE dedicated 10/100 adapters for iLO3
USB support	1 internal USB 2.0 connector; 1 micro SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 micro SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 micro SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 micro SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 micro SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector; 1 SD-HC card slot; 1 TPM 1.2 connector	1 internal USB 2.0 connector, internal micro SD card slot TPM 1.2 module support
Redundant power supply		Enclosure-based redundant power (single-phase and three-phase) DC power option						
Redundant fans		Redundant cooling using multiple hot-pluggable c-Class Active Cool Fans						
Infrastructure Management	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	iLO Management Engine, Insight Control	Integrated Lights-Out 3 (iLO 3), Insight Control	iLO Management Engine, Insight Control	HP iLO 3 Standard for BladeSystem and HP Insight Foundation	HP iLO 3 Standard for BladeSystem and HP Insight Foundation
Warranty (P - parts, L - labour, NBD - next business day onsite)		3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD	3-yr P, 3-yr L, 3-yr NBD
Support	**Proactive Care 3-year 24 x 7, 4-hour response (server, C7000 enclosure, C3000 enclosure)**							
	U3C18E	U3B14E	U3B14E	U3B14E	U3B32E	U3B32E	U3B32E	U3B32E
	U3C33E	U3C33E	U3C33E	U3C33E	U3C33E	U3C33E	U3C33E	U3C33E
	U3C42E	U3C42E	U3C42E	U3C42E	U3C42E	U3C42E	U3C42E	U3C42E
	HP Startup BladeSys c7000 Infrastructure SVC							
	UE602E	UE602E	UE602E	UE602E	UE602E	UE602E	UE602E	UE602E
	HP Startup BladeSys c3000 + ICE + OS SVC							
	UF817E	UF817E	UF817E	UF817E	UF817E	UF817E	UF817E	UF817E

Processors

	AMD Turion™ II Neo	Intel® Core™ i3-3200 Processor Series	Intel® Xeon® E3 Processor Series	Intel® Xeon® E3 Processor Series		Intel® Xeon® E5 Processor Series										
Socket capability	Single socket	Single socket	Single socket	Single socket		Dual socket										
Processor models	**NL54L**	**i3-3220**	**i3-2120**	**E3-1220**	**E3-1240**	**E5-2403**	**E5-2407**	**E5-2420**	**E5-2430**	**E5-2450**	**E5-2450L**	**E5-2603**	**E5-2609**	**E5-2620**	**E5-2630**	**E5-2630L**
Core Count	2	2	2	4	4	4	4	6	6	8	8	4	4	6	6	6
Clock speed (GHz)	2,2	3,3	3.3	3.1	3.3	1.8	2.2	1.9	2.2	2.1	1.8	1.8	2.4	2	2.3	2
QPI Speed (GT/s)	n/a	n/a	n/a	n/a	n/a	6.4	6.4	7.2	7.2	8	8	6.4	6.4	7.2	7.2	7.2
Cache L3 (MB)	2	3	3	8	8	10	10	15	15	20	20	10	10	15	15	15

	Intel® Xeon® E5 Processor Series (continued)															
Socket capability	Dual socket										Four Socket					
Processor models	**E5-2637**	**E5-2640**	**E5-2650**	**E5-2650L**	**E5-2660**	**E5-2665**	**E5-2667**	**E5-2670**	**E5-2680**	**E5-2690**	**E5-4603**	**E5-4610**	**E5-4617**	**E5-4620**	**E5-4640**	**E5-4650**
Core Count	2	6	8	8	8	8	6	8	8	8	4	6	6	8	8	8
Clock speed (GHz)	3	2.5	2	1.8	2.2	2.4	2.9	2.6	2.7	2.9	2	2.4	2.9	2.2	2.4	2.7
QPI Speed (GT/s)	8	7.2	8	8	8	8	8	8	8	8	6.4	7.2	7.2	7.2	8	8
Cache L3 (MB)	5	15	20	20	20	20	15	20	20	20	10	15	15	16	20	20

	Intel® Xeon® E7 Processor Series								AMD Opteron™ 6200 Processor Series					AMD Opteron™ 6300 Processor Series				
Socket capability	Four socket								Multi socket					Multi socket				
Processor models	**E7-2830**	**E7-2850**	**E7-2860**	**E7-4807**	**E7-4830**	**E7-4850**	**E7-4860**	**E7-4870**	**6212**	**6238**	**6272**	**6276**	**6282 SE**	**6320**	**6328**	**6344**	**6376**	**6380**
Core Count	8	10	10	6	8	10	10	10	8	12	16	16	16	8	8	12	16	16
Clock speed (GHz)	2.13	2	2.26	1.86	2.13	2	2.26	2.4	2.6	2.6	2.1	2.3	2.6	2,8	3.2	2.6	2,3	2.5
QPI Speed (GT/s)	6.4	6.4	6.4	4.8	6.4	6.4	6.4	6.4	HT3	HT3	HT3	HT3	HT3	6,4	6.4	6.4	6,4	6.4
Cache L3 (MB)	24	24	24	18	24	24	24	30	16	16	16	16	16	16	16	16	16	16

HP Hard-Disk drives

	Entry drives	Midline drives		Enterprise drives
Description	Lowest unit cost, performance and reliability intended for entry-level servers	High-capacity, lowest $/GB drives designed with economical reliability and performance		State-of-the-art design for maximum reliability and performance
Example application	Low I/O, non-mission-critical applications: entry server boot disk and storage	High-capacity environments: external storage, backups, archival, reference, redundant highly available applications		Mission-critical, high I/O environments: large database, e-mail/ messaging, ERP and CRM
Reliability and workload	Reliability for non-mission-critical entry server environments, appropriate for <40% workloads	Approximately 2x entry drive reliability based on <40% workloads		Ultimate reliability appropriate for intensive I/O, up to 3.5 x 3.5 entry drive reliability based on 100% workloads
Interface	SATA	SATA	SAS	SAS
Capacity	3.5" 250 GB	2.5" 500 GB, 1 TB 3.5" 500 GB, 1 TB, 2 TB, 3 TB, 4 TB	2.5" 500 GB, 1 TB 3.5" 1 TB, 2 TB, 3 TB, 4TB	2.5" 10 K, 300, 450, 600, 900 GB 2.5" 15 K, 72, 146, 300 GB 3.5" 15 K, 300, 450, 600 GB
Connectivity	Single port	Single port	Dual port	Dual port
RPM	7.2 K	7.2 K	7.2 K	10 K, 15 K
Warranty	1 year	1 year	1 year	3 year

HP Smart Array Options

	HP Smart Array P220i	HP Smart Array P420i/P420	HP Smart Array P222	HP Smart Array P421	HP Dynamic Smart Array B120i	HP Dynamic Smart Array B320i	HP Smart Array P822	HP Smart Array P721m
PCI bus	Embedded PCI-e 2.0 x 8	Embedded/Low Profile PCI-e 3.0 x 8	Low profile card PCI-e 3.0 x 8	Low profile card PCI-e 3.0 x 8	PCI-e 2.0 (4 GB/s unidirectional)	PCI-e 3.0 (4 GB/s unidirectional)	Full-height, half-length card PCI-e 3.0 x8	Mezzanine card for blades
Memory bus speed	DDR3-1333 MHz 40 bit (512 MB)	DDR3-1333 MHz 40 bit (512 MB) DDR3-1333 MHz 72bit 1 or 2 GB	DDR3-1333 MHz 40 bit 512 MB	DDR3-1333 MHz 72bit 1 or 2 GB	DDR3-333 MHz with 40-bit wide bus	DDR3-800 MHz with 40-bit wide bus	DDR3-1333 MHz 72bit 2 GB FBWC	DDR3-1333 MHz 40 bit (512 MB) DDR3-1333 MHz 72bit 2 GB
Memory options	512 MB FBWC	Zero Memory (for emb entry servers) 512 MB, 1 GB, 2 GB FBWC	512 MB FBWC	1 GB or 2 GB FBWC	512 MB FBWC	512 MB FBWC	2 GB FBWC	512 MB or 2GB FBWC
SAS/SATA connectivity	1 x 4 ports mini-SAS internal with expander support	2 x 4 ports mini-SAS internal with expander support	1 x 4 port internal and 1 x 4 port external	2 x 4 ports mini-SAS external with expander support	Up to 6 SATA drives	Up to 8 SATA/SAS* drives	2 x 4 ports mini-SAS internal with expander support; 4 x 4 ports external	4 x 2 ports external
Max drives	Up to 4	Up to 27 internal	Up to 4 int; 200 drives ext	Up to 200	-	-	Up to 227	Up to 149
Software management	ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage	ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage	ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage	ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage	ACU, ADU, Agents, Intelligent Provisioning, HP SIM, SSD Wear Gauge	ACU, ADU, Agents, Intelligent Provisioning, HP SIM, SSD Wear Gauge	ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage	Storage Management Utility ACU, SMH, SIM, ORCA, HP Service Pack for ProLiant Storage
RAID support	0 and 1 for blades	0, 1, 10, 5 and 50	0, 1, 10, 5 and 50	0, 1, 10, 5 and 50	RAID 0, 1 and 10	RAID 0, 1 and 10	0, 1, 10, 5, 6, 50, and 60	0, 1, 10, 5, 6 and 50
Optional features	Smart Array Advanced Pack 2.0	Smart Array Advanced Pack 2.0	Smart Array Advanced Pack 2.0	Smart Array Advanced Pack 2.0	-	HP Dynamic Smart Array SAS License	Smart Array Advanced Pack 2.0 is included	Smart Array Advanced Pack 2.0 is included

*SAS requires a licence

HP Host Bus Adapter

	HP H220 HBA controller	HP H221 HBA controller	HP H222 HBA controller
Description	2nd generation of 6 GB/s SAS HBA	2nd generation of 6 GB/s SAS HBA	2nd generation of 6 GB/s SAS HBA
PCI bus	PCI-e 3.0 (8 GT/s)	PCI-e 2.0 (5 GT/s)	PCI-e 3.0 (8 GT/s)
SFF HDD Support	Up to 27 SFF	Up to 149 SFF (P2000) Up to 200 SFF (D2700)	Up to 27 SFF
LFF HDD Support	Up to 12 LFF	Up to 96 LFF	Up to 12 LFF
Server Support	Gen8 server support only	Gen8 server support only	Gen8 server support only
Devices Supported	Tape drives support Internal drive cages	Shared storage P2000G3 Tape drives Support for D2600/D2700	Tape drives Internal drive cages Support for D2600/D2700
Ports	2 ports internal	2 ports external	1 port internal 1 port external

HP FlexibleNetwork adpaters for ProLiant Gen8 servers

	ProLiant BL							ProLiant DL/SL/ML							
Adpater	**544M**	**560 FLB/M**	**530 FLB/M**	**554 FLB/M**	**552M**	**361FLB**	**366M**	**544QSFP**	**530FLR/SFP/T**	**554FLR**	**560SFP/FLR-SFP+**	**331FLR/T**	**332T**	**361T**	**366FLR**
Number of ports	2	2	2	2	2	2	4	2	2	2	2	4	2	2	4
Transfer rate	10000	10000	10000	10000	10000	10/100/1000	1000	10/40 Gbps	10000	10000	10000		10/100/1000	1000	1000
VC Flex10 support			Flex10	Flex10, FlexFabric	Flex10										
PCI bus architecture	PCI-e Gen3	PCI Express						PCI-e Gen3	PCI Express						
Available Form factor	M	FLB, M	FLB, M	FLB, M	M	FLB	M	QSFP	FLR, SFP, T	FLR	SFP, FR SFP+	FLR, T	T	T	FLR

FLR = FlexibleLOM for ML/DL/SL; FLB = FlexibleLOM for Blades; M = Mezzanine for Blade, T = Ethernet Twisted-pair, C = Copper - IB and 10GbE, SFP+ = Small Form Factor Plug , QFP = Quad Small Form Factor Plug