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.

Increase the availability of IT systems

and business services with proactive

Accelerate the resolution of problems

and increase first time fix rate with

and support case generation

### World's most self-sufficient servers



### 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	Solid State Optimised:     For solid state to deliver a dynamic balance of 6x faster performance	Thermal Discovery Services:     Reduce energy usage and increase compute capacity	Insight Online:     The industry's first cloud-based, IT management and support portal
the steps, so you can deploy servers 3x faster	versus previous generations and capacity	<ul> <li>Location Discovery Services:</li> <li>Optimise workload placement with</li> </ul>	<ul> <li>Insight Remote Support: 24/7 remote monitoring with</li> </ul>
Active Health:     Troubleshoot 5x faster, monitor and log over 1,600 system parameters	<ul> <li>Smart Data Protection:</li> <li>50% more drive capacity, and 2x the number of drives in one RAID array,</li> </ul>	servers that self-identify and inventory themselves  • Power Discovery Services:	automatic notification on potential hardware problems and accurate resolution in less time
<ul> <li>and 100% of configuration changes</li> <li>Smart Update Built-in:</li> </ul>	new multiple smart data protection technologies are now built in	Eliminates power configuration errors, precisely tracks power usage	Proactive Services:     Innovative new services based on
Allows administrators to deploy updates 3x faster, with 93% less downtime during updates	Smart Data Services: Orchestrated with real-time analysis to build the future of converged storage	by rack and server by server, while eliminating manual record keeping	HP ProActive Inew Services Dased on HP ProActive Insight architecture improves infrastructure uptime and performance
<ul> <li>Deploy servers quickly and easily to keep pace with business growth</li> </ul>	<ul> <li>Increase storage capacity quickly and easily to stay ahead of data growth</li> </ul>	Reduce power consumption and operations costs	Save time managing IT infrastructure anytime, anywhere
<ul> <li>Simplify the out-of-the-box experience – no physical media or</li> </ul>	<ul> <li>Accelerate the performance of application workloads with</li> </ul>	<ul> <li>Squeeze more IT out of every bit of power and cooling capacity</li> </ul>	<ul> <li>Automate routine tasks to reduce costs and time spent troubleshooting</li> </ul>
downloads are needed for firmware, drivers, tools or agents	increased memory bandwidth and faster data throughput	Save valuable staff time by avoiding tedious manual discovery and	Prevent problems before they occur to keep business running smoothly
<ul> <li>Reduce downtime with continuous monitoring of server health</li> </ul>	<ul> <li>Protect data from hardware failures, application crashes and human errors</li> </ul>	<ul><li>inventory processes</li><li>Avoid datacentre outages by reducing</li></ul>	Simplify the support experience with automated 24/7 event monitoring

memory error detection

Scale capacity and performance in a

• Keep server firmware and software

up to date with minimal operator

· Free server administrators to focu

on strategic IT initiatives like cloud

(1)Insight Control is available on the e-Series rack servers only

Access IDC white paper on <a href="https://www.hp.com/go/bladesroi.">www.hp.com/go/bladesroi.</a>

**Next generation technologies** 

The new HP BladeSystem c7000 Platinum

FDR Infiniband, 40 GB Ethernet for high

16 GB Fibre Channel-ready with superior

scalability for storage.

virtualization needs

performance, low-latency networking and

The new 3R 24 GB RDIMM HP SmartMemory

BL660c Gen8 Server Blades, delivers greater

capacity and a 25% increase in performance

designed for the HP ProLiant BL460c and

direct attached storage & can be easily

upgraded to shared storage.

enclosure delivers the highest performance

including the fastest connectivity with 56 GB

in a future-proof design

(2)Intelligent Power Discovery Built-in

(3) Bundled on all Performance modelst

intervention

and virtualisation

HP ProLiant Gen8 E and P series mode	ls
e-Series Server Models (Essential)	p-Series Server Models (Performance)
Redefining essential and easy-to-use computing	The datacenter standard with leading performance and versatitlity
Right-Sized I/O Bandwidth and memory	Top Performance with 2x I/O and memory
Essential Storage Performance	<ul> <li>Leading Storage Performance</li> </ul>
• 1 GB Embedded Ethernet	<ul> <li>Most Flexible integrated Networking options</li> </ul>
Gold level 92% Power Efficiency	<ul> <li>Best Power Management and 94% Efficiency<sup>2</sup></li> </ul>
<ul> <li>Industriy Leading Management wiht Insight Control<sup>1</sup></li> </ul>	<ul> <li>Industriy Leading Management wiht Insight Control<sup>3</sup></li> </ul>
Key Serviceability features	<ul> <li>Enhanced User Experience and Serviceability</li> </ul>
• 3-1-1 Warranty offering	• 3-3-3 Warranty offering

HP BladeSystem c-Class: the world's most

for performance, scalable storage and intelligence for unprecedented insight into your data center.

7 months, a significant factor given the financial constraints most IT organizations are facing.

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

As the leading platform for virtualization and cloud, HP BladeSystem delivers breakthrough data center economics with the next generation networking

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

an essential foundation for a

software defined data center

deliver. It starts with HP BladeSystem, the world's most advanced blade infrastructure with next generation technologies in a future-proof design.

the risk of power redundancy failures

Reclaim datacentre capacity by

and circuit overloads

### **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

With over 5 million SAS Smart Array controllers shipped, HP Smart Array

controllers have delivered several innovations for protecting customer

Deliver value-added software features for SAS Smart Array controllers

which will further enhance the performance, reliability and availability of

HP's FlexNet Adaptors for ProLiant Gen8 bring some significant new value

customers can time stamp all communications so they know how long the

for our customers including increased performance, enhanced security.

power management and flexibility. With Precision Time Control feature,

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

Controller-based read caching solution that accelerates workload

performance by caching frequently accessed data ("hot data") on SSDs

Integrates seamlessly into your datacenter, requiring no application or

combination, these three pillars of our new, broader Insight Managemen

strategy provide functionality for remote control, inventory collection.

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

Consider just a few examples of savings in cost, risk, and people time, when

take advantage of PXE free environment, for our Gen8 servers, thereby

you deploy ProLiant servers with Insight Control. The payback period when

• Increase server deployment speed twelve-fold (20 minutes vs 4 hours)

significantly simplifying deployment experience for our customers.

you invest in Insight Control is just 4.2 months with a 642% ROI.

€54,623.17 (\$73,482) per 100 users over three years

• Reduce the cost of running your server infrastructure by up to

provisioning and deployment, maintenance and updates, health

management, power & cooling and remote support.

Manage your array and HP SmartCache through a common management

data, including the first RAID, first RAID 6/60, first Cache and first

Flashhack write cache, HP Gen8 Smart Arrays bring significant

enhancement to performance, manageability and flexibility.

www.hp.com/products/harddiskdrives

HP Smart Array Advanced Pack

**HP ProLiant Gen8 Networking** 

traffic is taking to get to and from the business.

connected to the HP Smart Array controller

tool - the HP Array Configuration Utility (ACU).

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

way to handle server networking

operating system changes.

**HP SmartCache** 

www.hp.com/servers/networking

www.hp.com/products/smartarray

customer data.

solutions. These solutions bring some significant new value for your customers by providing for significant increases in performance and power

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

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

### HP hard-disk drives

HP PCI-e Wor	kload Accelerators		HP Enterprise S	SDs		
Performance	Mainstream	Value	Performance Drive form factor	Mainstream Drive form factor	Value Drive form factor	Boot Drive form factor
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
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
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
Applications that r	equire lowest latency respons	e times	Unrestricted read/ write applications	Mixed read/write applications	High read/low write applications	High read/ Dynamic Throttled Write
	PCI-e High endurance ~25 DWPD 350/700 GB	PCI-e	Performance Mainstream Value  PCI-e PCI-e / Mezz PCI-e  High endurance ~10 DWPD Value endurance ~1 DWPD  350/700 GB 365/785 GB 1600 GB	Performance Mainstream Value Performance Drive form factor  PCI-e PCI-e / Mezz PCI-e 6 GB SAS  High endurance ~10 DWPD Value endurance ~1 DWPD High endurance ~25 DWPD  350/700 GB 365/785 GB 1600 GB 200/400 GB  Applications that require lowest latency response times Unrestricted read/	Performance Mainstream Value Performance Drive form factor  PCI-e PCI-e / Mezz PCI-e 6 GB SAS 6 GB SAS or 6/3 GB SATA  High endurance ~10 DWPD Value endurance ~1 DWPD Mainstream endurance ~10 DWPD  350/700 GB 365/785 GB 1600 GB 200/400 GB 1205/2410 GB/3000 GB 3200 GB  Applications that require lowest latency response times Unrestricted read/ Mixed read/write	Performance Mainstream Value Performance Drive form factor Drive form factor  PCI-e PCI-e / Mezz PCI-e 6 GB SAS 6 GB SAS 6 GB SATA 6/3 GB SATA  High endurance ~10 DWPD Value endurance ~1 DWPD PD PDWPD PDW

### How to transform server economics with your **ProLiant infrastructure**

Managing today's server infrastructures has its challenges.

HP Insight Control is essential server management that enables you to

servers. Insight Control delivers powerful capabilities that allow you to

costs, and control ProLiant servers from anywhere. As a result, you can

line-of-business (LOB) users. You can also respond to pressing business

optimizing the utilization of compute resources and datacentre facilities.

fully utilize the management capability built into your HP ProLiant

proactively monitor Prol jant server health and performance (both

reduce unplanned downtime and deliver stable IT services to your

needs faster by facilitating the rapid rollout of new IT services and

Insight Control provides single-console integration with leading

physical and virtual), deploy ProLiant servers quickly, reduce energy

• 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?

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

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 Power Discovery, now available with the HP BladeSystem Platinum Enclosure. automates power configuration and tracking to reduce unplanned downtime. In addition, ery 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

network by now converging your LAN and SAN

at the aggregation layer with **Dual hop FCoE**.

for new levels of scalability for tomorrow's The HP Mellanox SX1018 switch is the first to Now HP Virtual Connect builds on the wire-once provide 40 GB downlinks<sup>(2)</sup> to each blade server simplicity with the new Virtual Connect 4.0 enabling InfiniBand-like performance in an which adds intelligence to dyn**amically** Ethernet blade switch. The world's fastest allocate underutilized bandwidth ensuring Ethernet blade switch from HP, another customers achieve the highest return on their industry first the low-latency Ethernet switch networking investment. HP Virtual Connect delivers over **5X more bandwidth**(3) **and 4X** extends end-to-end integration with enterprise faster application response time(4). networking tools: Priority Queue QoS, enabling you to define the right service level for each Achieve up to 115.2 TB<sup>(5)</sup> of shared storage in a application; and sFlow with real-time network single enclosure with the next generation monitoring for intelligent capacity planning. In HP D2220sb Storage Blade, ideal for customers addition, HP Virtual Connect continues to looking to move to virtualization. It has the reduce costs by 47%<sup>(6)</sup> and simplifies your flexibility to add cost-effective, high-density



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%<sup>(7)</sup>, 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 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.

### ditional information

www.hp.com/qo/virtualconnect

🕦 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 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

<sup>(s)</sup>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 (8)Outfits up to 4X more NVIDIA Quadro 1000M graphics in the same HP c-Class enclosure space versus using WS460c Gen8 withou

**Ultimate efficiency and** performance for all vour virtual clients



### www.hp.com/go/bladesystem

www.hp.com/partners/emea/virtualconnect

HP iLO (Mobile App., S HP Agentless Management, HP Active Health System **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 <a href="www.hp.com/go/insight">www.hp.com/go/insight</a> To see how other customers have benefited by implementing HP Insight Management, read the IDC white paper at <a href="https://www.hp.com/go/insightroi">www.hp.com/go/insightroi</a>

Available with latest version of Insight Remote Support and customer opt-in

solutions, visit <u>www.hp.com/go/cloudsystem</u> To see demonstrations of HP Insight Management, visit the HP Solution Demo Portal at <a href="https://www.hp.com/go/insightswdemos">www.hp.com/go/insightswdemos</a> and www.hp.com/go/cloudsystemdemos

### **HP Rack and Power solutions**

### **HP Rack and Cooling Systems**

		1000 IIIIII DEPLII		1073 IIIIII DEPLII		1200 IIIIII Deptii	
		Pallet	Shock Pallet	Pallet	Shock Pallet	Pallet	Shock Pallet
47U	600 mm wide			BW911A - HP Intelligent Rack	BW912A - HP Intelligent Rack	BW913A - HP Intelligent Rack	BW914A - HP Intelligent Rack
					BW936A - HP Intelligent Air Duct Rack		
42U	600 mm wide	AF046A - HP v142 Rack		BW903A - HP Intelligent Rack	BW904A - HP Intelligent Rack	BW907A - HP Intelligent Rack	BW908A - HP Intelligent Rack
					BW910A - HP Intelligent Air Duct Rack		
					BW966A - HP Intelligent Network Rack		
42U	800 mm wide			BW917A - HP Intelligent Rack	BW918A - HP Intelligent Rack	BW919A - HP Intelligent	BW920A - HP Intelligent
					BW968A - HP Intelligent Network Rack	Rack	Rack
36U	600 mm wide			BW895A - HP Intelligent Rack	BW896A - HP Intelligent Rack	BW899A - HP Intelligent Rack	BW900A - HP Intelligent Rac
22U	600 mm wide	AF021A - HP 10000G2 Rack	AF022A - HP 10000G2 Rack				
14U	600 mm wide		292302-B22 - HP 10000G1 Rack				
War	ranty	3-year HP warranty (3-0-	0); HP Server and Storage ha	ardware support. Covers rack and	power products = "Integrated"	Care Pack.* support.	
Info	rmation	For more information and	detailed specs visit: www.h	p.com/eur/rackandpower			
Feed	lback	For questions or support of	contact <u>rackpowersolutions</u>	@hp.com			

1200 mm Depth

1075 mm Depth

### 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 Se	rver and Storage hardware support. Cov	vers rack and power products = "Integrat	ed" Care Pack support.*
Information	For more information and detailed	specs visit: www.hp.com/eur/rackandpov	<u>ver</u>	

### HP Uninterruptible Power Supplies (UPSs)

For questions or support contact rackpowersolutions@hp.com

	1-phase power input an	d output		3-phase power input ar	d output	
	Product Number	Power Output	Form Factor	Product Number	Power Output	Form Factor
		(VA/Watt)			(VA/Watt)	
	AF447A - HP T750 G2	750/500				
Tower	AF449A - HP T1000 G3	1000/670				
	AF451A - HP T1500 G3	1500/950				
Tower & Rack	AF468A - HP R/T3000 G2	3300/3000	2U			
	AF471A - HP R1500 G3	1500/1000	1U	AF432A - HP R8000/3	8000/8000	6U
Rack	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); H For HP RP36000/3 see Quicksp		rdware support. Cov	ers rack and power products; = "Ir	itegrated" Care Pack support.*	
Information	For more information and de	tailed specs visit: <u>www</u> .	.hp.com/eur/rackand	power		
Feedback	For questions or support con	tact <u>rackpowersolutions</u>	@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	Core		AF525A			AF526A	AF527A	
PDU	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 warr	anty (3-0-0); HP Serve	er and Storage hard	ware support. Covers rack and p	ower products = "Int	egrated" Care Pack suppo	ort.*
Information		For more infor	mation and detailed sp	ecs visit: www.hp.co	m/eur/rackandpower			
Feedback		For auestions of	or support contact rack	powersolutions@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 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.

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 leve 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?

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

HP Proactive Care Service (Proactive Care) offers an integrated set of

proactive and reactive services designed to help improve the availability

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.

# **Proactive**



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### **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 I' 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 Converged Application Systems Strategy** Accelerate time to value Solutions Aligned to Customer Deployment Models Deploy in weeks rather than months

### **HP VirtualSystem**

HP VirtualSystem solution simplifies and extends 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

HP Virtual System 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

**Client Virtualization** HP extends the Virtual System portfolio to enterprise client virtualization providing the fastest, path to agile and efficient virtualized solutions based or Citrix XenDesktop on Microsoft Hyper-V or VMware

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

### **HP AppSystems**

HP has introduced AppSystems, a portfolio of integrated systems optimized to deliver maximu performance for dedicated business applications HP AppSystems are: simplified, integrated architecture: Industry's most complete, open and integrated 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 Agile to leverage existing investments and rapidly

scale to meet changing business needs. for Microsoft SharePoint 2013 and SOL Server 2012 are used to deliver a Self Service, Business Intelligence

Reference Architecture that empowers business user to accelerate analysis and decision making from months 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. 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 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 HP Business Data Warehouse Appliance optimized for Microsoft SQL Server Reduces the complexities and costs

warehouses, in a fast, affordable and easy to deploy 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.

**HP Database Consolidation Solution optimized for** Microsoft SOL Server enables consolidation of thousands of transactional databases into a single, virtual environment to simplify database mana 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

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 enterprisegrade 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 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/cloudsysten www.hp.com/qo/trycloudsysten

## 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.





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

and migration speed four-fold • Reduce downtime by up to 83%. Eliminate server maintenance-related

• 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 vou 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 Engine on the system board, consists of Insight Control on the central physical and virtual resources together, with greater simplicity, and management server and Insight Online in "the cloud". Together and in any accomplish more in less time. Continuously align your infrastructure to the needs of your business so that you deliver better service.

HP ProLiant Server Platforms	HP ProLiant	All	All	All
	Gen8 e-series	HP ProLiant	HP ProLiant	HP ProLiant G2-Gen8
Service and Support Events				Yes <sup>4</sup>
Channel Partner Access				Yes
Contracts and Warranty Management				Yes
VMware® vCenter Server Intergration			Yes <sup>4</sup>	
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 <sup>4</sup>
Virtual Media, Folders, Keyboard, Video and Mouse	Yes	Yes	Yes	
HP iLO Management Engine¹	Yes	Yes	Yes	
HP iLO Management Engine, in all ProLiant Gen8 servers, includes: HP iLO (Mobile App., Sea of Sensors Thermal Management), HP Intel	ligent Provisioning,	<sup>2</sup> Windows CMS managed node: <sup>3</sup> Available with standard HP co		re Pack services in the

HP Insight Management is an essential infrastructure management building block for developing a cloud environment, to learn more about HP's cloud

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ProLiant series Typical applications	MicroServer  Cost-effective starter server for businesses with fewer than ten clients, that will take	DL160 Gen8 High performance	ML310e Gen8				B			29.7 COMMENT OF 0					e					0			
ypical applications	server for businesses with fewer than ten clients, that will take			DL320e Gen8	ML350e Gen8	DL360e Gen8	DL380e Gen8	ML350p Gen8	DL360p Gen8	DL380p Gen8	DL385p Gen8	DL560 Gen8	DL580 G7	DL585 G7	DL980 G7	WS460c Gen8	BL420c Gen8	BL460c Gen8	BL465c Gen8	BL620c G7	BL660c Gen8	BL680c G7	BL685c G7
	your business to the nex level of productivity and efficiency		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	Enhanced management, sleek design, and exceptional serviceability bundled with essential features makes the DL360e Gen8 the	With enhanced storage performance,	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		Versatile workhorse for the		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	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	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,	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	Ideal for virtualisation multi-tiered enterpris: applications such as SAP, PeopleSoft, Siebe Oracle® and JDE, serve consolidation, large database applications ERP, CRM, mail and messaging, business integration application
Processors Additional processor nodels are available on equest. Please check the product QuickSpecs for nore 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 Intel® Pentium® and Intel® Core™ i3-3200 series ( 2/4 core) processors - models: G2020, 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	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	series processors - models E7-2850, E7-2860, E7-4870,	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, E5-2660, 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	series (8/12/16 core)
orm factor	Ultra Micro Tower (no rackmount capability)	Rack (1U)	Micro ATX Tower (4U)	Rack (1U)	Tower (5U)	Rack (1U)	Rack (2U)	Tower and Rack (5U)	Rack (1U)	Rack (2U)	Rack (2U)	Rack(2U)	Rack (4U)	Rack (4U)	Rack (8U = 14)	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 (c300
Aemory 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 DDR: RDIMMs/max. 192 GB with RDIMMs or 2 GB, 4 GB and 8 GB/max. 96 GB with UDIMMs	3 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	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		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 2 GB) Quad Rank x 4 PC3L-8500R-7 (DDR3- 1333) Registered CAS-9 LP Memory Kit	RDIMM 8 x 8 GB DDR3 1600 MHz 4 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	) (DDR3-1333) LRDIMM;	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
/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	(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	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	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 +	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	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,	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	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	slots: for 1 GbE, 10 GbE, 10 GB Flex-10, 10 GB FlexFabric, 8 GB Fibre Channel adapters, QDR & FDR Infiniband,	7 mezzanine I/O expansion slots: one dedicated to a dual-port LAN adapter including 1 GbE, 10 GbE, 10 GB 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	3 mezzanine I/O expansion slots: for 1 GB, 10 GB and Flex-1 FlexFabric FCoE capabl 10 GB Ethernet adapte iSCSI adapters, 4 GB and 8 GB Fibre Channel adapters and 4 x QDR (40 GB/s) Infiniband adapters
torage 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)	Array B120i SATA Controller (RAID 0/1/10), B320i or P420 (RAID	HP Dynamic Smart Array B120i SATA Controller (RAID 0/1/10), B320i or P420 (RAID 0/1/1+0/5/5+0)	1 .	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	(2) PCI-X  HP Smart Array P410i controller	+ (2) PCI-X  HP Smart Array P410i controller	1 PCI-e 2.0 x 4  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.	M2070Q. ATI FS9350  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)	with RAID (0/1) capability, 512 MB flash	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	Array adapters  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 G FBWC
itorage (maximum)	Pluggable max. 8 TB LFF SATA (4 x 2 TB)	12 TB LFF Hot Plug SAS/ SATA; 8 TB SFF Hot Plug		8 TB (8 x 1 TB) 2.5 SFF.	1 TB) with optional drive	12 TB (8) SFF Hot Plug bays (4) LFF Hot Plug d 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)	1	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)	(8 or 12) LFF Hot Plug	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	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 × 1 TB) 2 TB SFF SATA (2 × 1 TB) 800 GB SFF SATA SSD (2 × 400 GB)
ptical drive support	Optional DVD or DVD-RW	V Optional	Optional	DVD-ROM or DVD-RW	Optional	Optional	Optional	Optional	Optional	Optional	Optional (not available on some models-drive cage	Optional	Optional	Optional	Slimline DVD-RW Drive standard	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with c3000 enclosure	Enclosure-based DVD drive available with	Enclosure-based DVD drive available with	Enclosure-based DVD drive available with c3000	Enclosure-based DVD drive available with c3000	Enclosure-based DVD drive available with c3000	Enclosure-based DVD drive available with
letwork interface ontroller	Embedded NC107i PCI-e GB Ethernet Server Adapter	HP NC361i Integrated r 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	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	dependant)  1) HP Ethernet 1 GB 4-port Adapter (FlexibleLOM). Optional: FlexibleLOM available for 10 GbE, CNA, SFP+ and IB	Adapter (FlexibleLOM); optional FlexibleLOM	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	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	c3000 enclosure  Dual-port FlexibleLOM for choice of 10 GB FlexFabric, 10 GB Flex-10, 10 GB Ethernet	c3000 enclosure  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 FC0E/Ethernet/iSCSI/Flex- 10/T0E; dedicated 10/100 adapter for iLO3	10 GB Flex-10,	enclosure  Six embedded NC553i 10 GB FlexFabric converged network adapter ports with FCoE/Ethernet/iSCSI/Flex- 10/T0E; dedicated 10/100 adapter for iLO3	10 GB converged network adapters (CNA
JSB 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	<b>7 total:</b> 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	10 total: 4 front, 4 rear, 2 internal;	7 total: 2 front, 4 rear, 1 internal;	7 total: 2 front, 4 rear, 1 internal:	8 total: 2 front, 4 rear, 2 internal;	7 total: 2 front, 4 rear, 1 internal;	6 total: 2 front, 2 rear, 2 internal;	6 total: 2 front, 2 rear, 2 internal:	6 total: 2 front (video); 2 rear (video, NIC); 2 internal <sup>(1)</sup>	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 internal USB 2.0 C connector; 1 micro SD-HC card slot;	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	
Redundant power supply	No	No	Yes	Yes	No No	Yes	Yes	+ 1 internal SD slot  Yes	+ 1 internal SD slot Yes	+ 1 internal SD slot Yes	+ 1 internal SD slot Yes	+ 1 internal SD slot Yes	+ 1 internal SD slot  4 total: 2 + 2 redundant; 4 ship standard in 4P models, 2 ship standard in 2P models	+ 1 internal SD slot  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).	Enclosure-based redundant power (single-phase and three-phase) DC power option	T TT T LE COMICCIO	1 TPM 1.2 connector	1 TPM 1.2 connector	It power (single-phase and thre		THAT I.E CONNECTION	module support
Redundant fans	No	Yes	No	Yes	No	Yes	Yes	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	Redundant cooling using multiple hot- pluggable c-Class Active Cool Fans			Redundant cooling u	sing multiple hot-pluggable c-C	lass Active Cool Fans		
nfrastructure Management	HP MicroServer Remote Access Card (standard)	3 ,	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	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	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 iLO 3 Standard for BladeSystem and
Varranty (P - parts, - labour, NBD - next ousiness 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, 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	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	HP Insight Foundation 3-yr P, 3-yr L, 3-yr NBD	HP Insight Foundation 3-yr P, 3-yr L, 3-yr NBD
Support	n/a	U3A18E	Proacti U6F73E	ive Care 3-year 24/7, 4-hour U6F03E	r response U6C93E	U6D63E	U6G61E	U3A78E	U2Z86E	U2Z50E	ve Care 3-year 24/7, 4-hour ro U2Z50E	esponse U6H10E	U2Z68E	U2Z68E	U3Q06E	U3C18E	U3B14E	U3B14E	U3B14E	ver, C7000 enclosure, C3000 en U3B32E	U3B32E	U3B32E	U3B32E
	n/a	U9520E	U4457E	nstallation and Startup Serv U4491E	vice U4523E	U4507E	U4555E	U4523E	U4507E	U4555E	stallation and Startup Servio U4555E	CE U6H60E	U4618E	U4618E	UM451E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E	U3C33E U3C42E
1	,						I								l ditional information regarding USB support: ucts/servers/platforms/usb-support.html	UE602E	UE602E	UE602E	P Startup BladeSys c7000 II UE602E HP Startup BladeSys c3000	UE602E	UE602E	UE602E	UE602E
	AMD Turion™ Intel® C															UF817E	UF817E	UF817E	UF817E	UF817E   <b>D Opteron™ 6200</b>	UF817E	UF817E <b>4D Opteron™ 6300</b>	UF817E

	AMD Turion™ II Neo	Intel® Core™ i3-320 Processor Series	O Intel® Pe		Intel® Xeon® E3 Processor Serie	111000	eon® E3 or Series	Intel® Xe																										Intel® Xe	eon® E7 or Series							D Opteron™ cessor Serie				111111111111111111111111111111111111111	eron™ 6300 or Series	)	
Socket capability	Single socket	Single socket	Single soo	ket	Single socket	Single so		Dual sock																				Four S						Four sock	et						Mult <sup>7</sup>	ti socket				Multi sock	æt		
Processor models	NL54L	i3-3220	G2020	G2120	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	E5-2637	E5-2640 I	5-2650 E	5-2650L E5	-2660 E5-2	2665 E5-2	667 E5-26	70 E5-268	80 E5-2690	E5-460	3 E5-4610	E5-4617	E5-4620	E5-4640	E5-4650	E7-2830	E7-2850	E7-2860	E7-4807	E7-4830 E	E7-4850 E	E7-4860 E7-	-4870 6217	2 6238	6272	6276	6282 SE	6320	6328	6344 6	376 6380
Core Count	2	2	2	2	2	4	4	4	4	6	6	8	8	4	4	6	6	6	2	6 8	3 8	8	8	6	8	8	8	4	6	6	8	8	8	8	10	10	6	8 1	10 1	0 10	8	12	16	16	16	8	8	12 1	6 16
Clock speed (GHz)	2.2	3.3	2.9	3.1	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	3	2.5	2 1	.8 2.7	2.4	2.9	2.6	2.7	2.9	2	2.4	2.9	2.2	2.4	2.7	2.13	2	2.26	1.86	2.13 2	2 2	2.26 2.4	2.6	2.6	2.1	2.3	2.6	2.8	3.2	2.6	.3 2.5
QPI Speed (GT/s )	n/a	n/a	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	В	7.2 8	3 8	8	8	8	8	8	8	6.4	7.2	7.2	7.2	8	8	6.4	6.4	6.4	4.8	6.4	5.4	.4 6.4	HT3	HT3	HT3	HT3	HT3	6.4	6.4	6.4	.4 6.4
Cache L3 (MB)	2	3	3	3	3	8	8	10	10	15	15	20	20	10	10	15	15	15	5	15 2	20 2	0 20	20	15	20	20	20	10	15	15	16	20	20	24	24	24	18	24 2	24 2	4 30	16	16	16	16	16	16	16	16 1	ā 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 and performance	designed with economical reliability	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: exte reference, redundant highly availa		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 relia	bility 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 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 Expr	ess			PCI-e Gen3			PCIE	xpress			
Available Form factor	М	FLB, M	FLB, M	FLB, M	М	FLB	М	QSFP	FLR, SFP, T	FLR	SFP, FR SFP+	FLR, T	Т	Т	FLR

### HP Smart Array Options

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	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	-	HP Dynamic Smart Array SAS License	Smart Array Advanced Pack 2.0 is	Smart Array Advanced Pack 2.0 is			

### HP Host Bus Adapter

IP HUST DUS	Auaptei		
	HP H220 HBA controller	HP H221 HBA controller	HP H222 HBA controller
Description	2 <sup>nd</sup> generation of 6 GB/s SAS HBA	2 <sup>nd</sup> generation of 6 GB/s SAS HBA	2 <sup>nd</sup> 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





