HP ProLiant Servers

Blade, x86 mainstream rack and tower, and hyperscale servers



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Is Big Data holding you back?

The cloud era has created an unprecedented explosion of data and digital information. The impact on data centers is tremendous. With highly virtualized environments and unpredictable workloads, a typical 10,000-square-foot data center can see demand for storage capacity grow by 45% each year. And along with that demand comes the burden of protecting and analyzing data that will generate useful business insight.

But the impact isn't just on your infrastructure's outdated servers. There is a ripple effect that reaches out to your entire server infrastructure and into data center operations. For every new rack of storage, seven racks of server computing power are needed. And those servers must be integrated, managed, powered, cooled, and supported.²

For many data centers, IT infrastructure and operations have reached a breaking point; incremental improvements no longer work. It's time for a server that works smarter, so that everything works better.

HP ProLiant—the world's most selfsufficient server

Customer inspired, HP ProLiant Gen8 Servers are unlike anything else in the market. HP ProLiant Gen8 Servers include over 150 design innovations that allow administrators to increase application performance, and free up resources to focus on business innovation.

Built on HP ProActive Insight architecture, the new servers constantly analyze over a thousand system parameters to get the best application performance and proactively improve uptime— all while providing actionable insight into every aspect of your IT infrastructure.

HP ProLiant Gen8 introduces HP-only and industry-first innovations that use embedded intelligence to get rid of manual tasks and automate IT operations.

¹ Number of global searches conducted per year: 1.6 trillion McKinsey & Company study, 2010

HP ProActive Insight architecture

ProLiant Gen8 is about transforming the server experience not just what's inside the box.

HP ProActive Insight architecture is the foundation of every ProLiant Gen8 Server. It is a rich set of capabilities that help IT administrators boost application performance, protect data, simplify server operations, optimize energy efficiency, and streamline the support experience. These servers are able to inform, learn, and grow—while constantly and proactively fixing issues and helping you tackle everyday tasks. The HP ProActive Insight architecture includes built-in intelligence, analytics, and a 3D Sea of Sensors embedded across the infrastructure that continuously analyzes over 1,600 system parameters. This innovation enables automation of manual tasks and proactively respond to common alerts to prevent failures. Further, it enables technologies such as HP Active Health, HP Smart Array, HP Location Discovery, HP Insight Online and Proactive Support Service. These HP-only innovations help IT administrators get more work done with less effort.

HP ProActive Insight architecture supports maximum uptime and the best application performance with the least amount of admin effort, system downtime, and power consumption.

Figure 1. HP ProActive Insight architecture

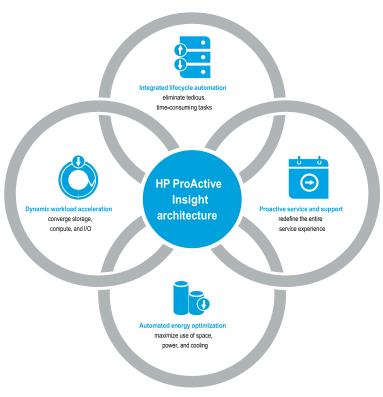


Figure 2. Peak performance indicators

Integrated lifecycle automation

Dynamic workload acceleration

Automated energy optimization

Proactive service and support

3x

Admin productivity

Based on internal testing with a fully online firmware and system software update with HP SUM 5.0 vs. HP SUM 4.2

6x

Performance increase for the most demanding workloads

6x improved storage performance: New HP Smart Array controllers (HP ProLiant Gen8) compared to the current generation HP Smart Array controllers (HP ProLiant G7) in a RAID configuration. Performance varies depending on server configuration; Internal HP Lab testing

70%

More compute per watt

1.7x compute per watt over previous server replacement cycle model* * Based on HP internal testing with a 50% increase in server performance (OLTP applications), a 10% reduction in per server energy consumption plus 7% cooling reduction from Intelligent Series rack. Assuming a conservative PUE of 2.0, translates 7% cooling to 3.5% reduced cooling power. 10% (< per server) + 3.5% (< from "Intelligent Series" 13.5%. rack) (performance) x 113.5% (servers/ P&C envelope) = 1.5 x 1.135 = 1.70

66%

Faster time to problem resolution

Up to 66% faster problem resolution time for HP Insight Remote Support-initiated cases (HW) vs. traditional phone support Source: HP internal call center data, Q4 FY11 (calculation based on average of 7.1 hours for an Insight Remote Support-initiated cases vs. 11.8 hours for phone-initiated cases)



Automate

Integrated lifecycle automation

HP ProLiant Gen8 Servers use intelligence to automate the most common tasks during each step of the IT lifecycle. The HP Active Health system continuously monitors and securely logs over 1,600 system parameters and 100% of all configuration changes, empowering you with the insight to keep your systems running at peak performance with minimal downtime and effort.

Key pillar features:

- **HP Intelligent provisioning:** Get systems online 3x faster³ with a fully integrated system and OS configuration tool.
- **HP Active Health:** 24x7 Mission control for delivering maximum uptime through automated monitoring, self-diagnosis and alerting.
- **HP Smart Update:** Breakthrough system maintenance tool with oneclick simplicity that systematically updates servers and blade infrastructures at the scale of your data center.



Accelerate

Dynamic workload acceleration

HP engineers balanced the system architecture while unifying storage, I/O, and compute resources to make data-intensive application performance run faster. This approach brings storage and compute closer together, eliminates much of the cost and complexity, and removes the most common performance bottleneck—storage.

Key pillar features:

- Solid state optimized: Engineered for solid state storage with built-in analytics to deliver a dynamic balance of performance and capacity.
- Smart data protection: Confidently protect data and ensure uptime for continuous business operations.
- Smart data services: Orchestrated with real-time analysis to build the future of converged storage.



Optimize

Automated energy optimization

Intelligent and efficient server and infrastructure technologies reduce the power and airflow needed to operate HP ProLiant Gen8 Servers. These technologies reclaim limited space, power, and cooling resources for needed workloads, while also reducing error-prone manual checking and documenting of power and rack configurations.

Key pillar features:

- Location Discovery Services: Optimize workload placement with servers that self-identify and inventory themselves.
- Thermal Discovery Services: Reduce energy usage and increase compute capacity.
- Power Discovery Services: Eliminate power configuration errors, precisely track power usage by rack and server by server, while eliminating manual recordkeeping.



Support

Proactive service and support

HP Insight Online is the industry's first comprehensive cloud-based IT management and support solution for an HP environment. Connected to HP Services and HP-authorized channel partners, including 2,000 ServiceONE experts, HP delivers unique support and services that are intuitive, dynamic, and automated. HP experts help clients proactively resolve issues, deliver real-time insight, and continuously maximize data center operations uptime.

Key pillar features:

Insight Online: The industry's first comprehensive cloud-based, IT management and support solution integrated with HP Insight Remote Support.

Proactive Support Services: Technology enabled, reactive and proactive services based on ProActive Insight architecture improves infrastructure uptime and performance.

ServiceONE Advantage: Qualified local partners to plan, manage and deliver solutions spanning the entire IT lifecycle.

 $^{^3}$ Based on internal testing with a fully online firmware and system software update with HP SUM 5.0 vs. HP SUM 4.2

Selecting the right server

With one HP ProLiant Server shipping every 11.7 seconds⁴ and more than 30 million sold, HP ProLiant Servers are the undisputed market share leader.⁵ This high-level market acceptance stems in part from our ongoing commitment to providing a complete industry-standard server infrastructure that delivers confidence and reliability.

Whether it's a departmental server, an enterprise data center, or anything in between, HP can meet your exact needs. You can choose the right levels of performance, availability, expandability, and manageability.

Figure 2. HP ProLiant Server portfolio



HP ProLiant BL family

Cloud-ready converged infrastructure engineered to maximize every hour, watt and dollar

The ProLiant BL family of servers

HP ProLiant BL Servers offer the ideal balance of performance with scalability, and are the standard for a wide variety of enterprise business and HPC scale-out applications for small, medium, and enterprise data centers.

This next-generation ProLiant blade offers increased processor, memory, storage, and I/O performance.

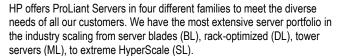
HP ProLiant Gen8 BL family includes:

- HP ProLiant BL400c series—Ideal balance of performance, density, and efficiency for enterprise applications
- HP ProLiant BL600c series—Unparalleled blade performance and expansion for the most demanding workloads

For more information about HP BladeSystem, visit hp.com/blades.

To learn more about each HP BladeSystem Server, visit the HP BladeSystem Family Guide at

https://h20195.www2.hp.com/V2/%20GetPDF.aspx/4AA1-4286ENW.pdf



To help you find the Gen8 version of your current equipment, select the best server for your environment, and find the best fit for your organization's needs, please visit the HP ProLiant Gen8 model transition guide.



HP ProLiant DL family

Versatile, rack-optimized server with a balance of efficiency, performance and management

The ProLiant DL family of servers

HP ProLiant DL Servers offer versatile rack-optimized servers that balance efficiency, performance, and management. HP DL Servers deliver decades of engineering knowledge and integration experience to speed the implementation of new business computing technology.

HP ProLiant DL Servers are powerful servers in 1, 2, 4, 5, or 8U configurations that are ideal for performance-driven compute processes with an array of internal storage options in a dense rack package. For Gen8, the servers offer an increased processor core count, memory, and internal storage capacities. They also offer the next generation of embedded HP Smart Array technology.

HP ProLiant Gen8 DL family includes:

- HP ProLiant DL100 series—High performance computing in an affordable and dense design
- HP ProLiant DL300p series—Rack server data center standard with leading performance and versatility
- HP ProLiant DL300e series—Rack servers that redefines essential and easy-to-use computing
- HP ProLiant DL500 series—Scale-up servers for demanding computeintensive workloads

HP ProLiant Gen8 Servers transform the experiences and economics of applications and data optimization,

⁴ CQ212 IDC Server Tracker

 $^{^{\}rm 5}$ IDC 4CQ2011. HPQ has shipped over 30 million servers through CQ212.

server operations, data center efficiency, and IT support.



HP ProLiant ML family

Expandable tower servers ideal for remote and branch offices and growing businesses

The ProLiant ML family of servers

HP ProLiant ML Servers are flexible, expandable tower (tower/rack option) servers that are the ideal choice for remote/branch offices, data centers, or SMBs that require a server that can provide maximum performance for current requirements and expansion for future growth.

The ProLiant ML300 series is available in either rack or tower models.
These servers are ideal for applications ranging from running in the remote branch offices or datacenters requiring large amounts of internal storage and I/O to SMBs requiring essential compute and expansion capabilities. The ML300 series incorporates the latest Gen8 innovations in storage, memory, and management.

HP ProLiant Gen8 ML family includes:

- HP ProLiant ML300p series—The flexible tower or rack data center standard with leading performance and versatility
- HP ProLiant ML300e series—Tower servers that redefine essential and easy-to-use computing



HP ProLiant SL family

Purpose-built for the world's most extreme data centers

The ProLiant SL family of servers

HP ProLiant SL Servers are purpose-built for the most demanding hyperscale environments. Ideal for web/hosting/cloud service providers and High Performance Computing environments, the SL family of servers enables rapid deployment, greater agility, and lower operational cost.

HP ProLiant Gen8 SL family includes:

• HP ProLiant Servers SL6500—Purpose-built for High Performance Computing using modular servers, the HP ProLiant SL6500 servers incorporates high performance features such as FDR InfiniBand and integrated GPUs, within an innovative shared infrastructure to greatly reduce costs, increase power efficiency, and density.

To learn more about HP ProLiant SL6500 Scalable System, visit **hp.com/servers/SL6500**.

For more information about HPC solutions, visit hp.com/go/HPC.

⁶ Please reference server QuickSpecs for product specific offerings

HP ProLiant Servers—MicroServer, 100, and 300e series

Redefining essential and easy-to-use computing











	MicroServer	ML110 G7	ML310e Gen8	ML330 G6	ML350e Gen8
	Ideal entry-level server with essential features for small business	Perfect first server for growing business	Essential availability and expansion in a 1P tower	Performance and manageability to scale your business	Essential performance with room to grow
Number of processors	1	1	1	1 or 2	1 or 2
Maximum number of cores	2	4	4	12	16
Processor family	AMD TurionTM II	Intel® Xeon® E3 Intel® CoreTM i3 Intel® Pentium® Intel® Celeron®	Intel® Xeon® E3- 1200v 2 Intel® CoreTM i3- 3200 Intel® Pentium® Intel® Celeron®	Intel® Xeon® 5500 series Intel® Xeon® 5600 series	Intel® Xeon® E5- 2400
Maximum processor frequency	1.5 GHz	3.5 GHz	3.60 GHz	2.53 GHz	2.4 GHz
Memory slots	2	4	4	18	12
Maximum memory per server	8 GB	16 GB	32 GB	192 GB	192 GB
Networking ports (embedded)	(1) 1GbE	(2) 1GbE	(2) 1GbE	(2) 1GbE	(2) 1GbE
Maximum FlexibleLOM ports	None	None	None	None	None
Dedicated iLO/LO100 LAN port	N/A	Optional	Optional	Standard	Standard
Maximum drive bays (All drives are hot plug unless otherwise noted)	4 LFF NHP SATA	8 SFF SAS/SATA 4 LFF NHP SAS/SATA	4 LFF NHP SAS/SATA 4 LFF SAS/SATA/SSD 8 SFF SAS/SATA/SSD	8 LFF SAS/SATA/SSD 8 LFF NHP SAS 4 LFF NHP SATA	24 SFF SAS/SATA/SSD 18 LFF SAS/SATA/SSD 4 LFF NHP SATA
Maximum internal storage	8 TB	8 TB	12 TB	24 TB	54 TB
I/O expansion slots	2 PCle	4 PCle 2.0	2 PCle 3.0 2 PCle 2.0	2 PCle 3.0 2 PCle 2.0	2 PCIe 3.0 2 PCIe 2.0
Form factor	Ultra micro-tower	4U micro ATX tower	4U micro ATX tower	5U tower	5U tower
Management	HP MicroServer Remote Access Card (optional)	HP iLO 3 (standard)	HP iLO Management Engine (standard)	HP iLO 2 (standard)	HP iLO Management Engine (standard)
Warranty, year(s) (parts/labor/onsite)	1/0/0	1/1/1 WW 3/1/1 Brazil	1/1/1	3/1/1	3/1/1

For Operation System Support information, visit hp.com/go/ossupport.

For additional details on supported options, visit the server QuickSpecs at **hp.com/go/quickspecs**.

HP ProLiant Servers—MicroServer, 100, and 300e series (continued)

Redefining essential and easy-to-use computing

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	DL120 G7	DL320 G6
	Best solution for dedicated groups and applications	Entry compute power with enterprise manage- ment for remote or space-constraine installations
Number of processors	1	1
Maximum number of cores	4	6
Processor family	Intel® Xeon® E3 Intel® CoreTM i3 Intel® Pentium® Intel® Celeron®	Intel® Xeon® 5600 series Intel® Xeon® 5500 series
Maximum processor frequency	3.5 GHz	2.66 GHz
Memory slots	4	9
Maximum memory per server	32 GB	144 GB
Networking ports (embedded)	(2) 1GbE	(2) 1GbE
Maximum FlexibleLOM ports	None	None
Dedicated iLO/LO100 LAN port	Optional	Optional
Maximum drive bays (All drives are hot plug unless otherwise noted)	8 SFF SAS/SATA 4 LFF SAS/SATA	8 SFF SAS/SATA/SSD 4 LFF SAS/SATA/SSD
Maximum internal storage	8 TB	12 TB
I/O expansion slots	2 PCle 2.0	2 PCIe Optional 1 PCI-X
Form factor	1U rack	1Ú rack
Management	HP iLO 3 (standard)	HP iLO 2 (standard)
Warranty, year(s) (parts/labor/onsite)	1/1/1	3/3/3

HP ProLiant Servers—MicroServer, 100, and 300e series (continued)

Redefining essential and easy-to-use computing

			10	12.
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	DL160 G6	DL160 Gen8	DL165 G7	DL320e Gen8
	Designed for general-	High-performance	Designed for low-cost	Ideal single-application
	purpose and compute-	computing with increased	memory and	and IT infrastructure
	intensive environments	manageability in a dense 1U design	computeintensive environments	server
Number of processors	1 or 2	1 or 2	1 or 2	1
Maximum number of cores	12	16	24	4
Processor family	Intel® Xeon® 5600	Intel® Xeon® E5-2600	AMD Opteron™ 6200	Intel® Xeon® E3 v2
•	series Intel® Xeon®		Series AMD Opteron™	Intel® Core™ i3 Intel®
	5500 series		6100 Series	Pentium®
Maximum processor	3.6 GHz	3.0 GHz	3.3 GHz	3.7 GHz
frequency				
Memory slots	18	24	24	4
Maximum memory per	288 GB	768 GB	384 GB	32 GB
server				
Networking ports	(2) 1GbE	(2) 1GbE	(4) 1GbE	(2) 1GbE
(embedded)				
Maximum FlexibleLOM	None	(4) 1GbE or (2) 10GbE	None	None
ports		(optional)		
Dedicated iLO/LO100 LAN	Optional	Standard	Optional	Standard
port				
Maximum drive bays	8 SFF SAS/SATA/SSD	8 SFF SAS/SATA/SSD 4	8 SFF SAS/SATA/SSD	8 SFF SAS/SATA/SSD
(All drives are hot plug unless	4 LFF SAS/SATA /SSD	LFF SAS/SATA /SSD 4	4 LFF SAS/SATA /SSD	4 LFF SAS/SATA /SSD
otherwise noted)	4 LFF NHP SAS/SATA	LFF NHP SAS/SATA	4 LFF NHP SAS/SATA	4 LFF NHP SAS/SATA
Maximum internal storage	12 TB	12 TB	12 TB	12 TB
I/O expansion slots	2 PCle 2.0	2 PCle 3.0	2 PCIe 2.0	1 PCIe 2.0
	411	411	411	1 PCle 3.0
Form factor	1U rack	1U rack	1U rack	1U rack
Management	HP LO100i (standard)	HP iLO Management	HP LO100i (standard)	HP iLO Management
		Engine (standard)		Engine (standard)
Warranty, year(s)	3/0/0 AMS, EMEA 3/1/1	3/0/0 AMS, EMEA 3/1/1	3/0/0	1/1/1
(parts/labor/onsite)	APJ	APJ		

HP ProLiant Servers—MicroServer, 100, and 300e series (continued)

Redefining essential and easy-to-use computing







	DL360e Gen8	DL180 G6	DL380e Gen8
	Essential features in an optimized design	Flexible and reliable value server for growing businesses needing expandability	Compute and storage, ideal for essential data center needs
Number of processors	1 or 2	1 or 2	1 or 2
Maximum number of cores	16	12	16
Processor family	Intel® Xeon® E5-2400	Intel® Xeon® 5600 series Intel® Xeon® 5500 series	Intel® Xeon® E5-2400
Maximum processor frequency	2.4 GHz	3.2 GHz	2.4 GHz
Memory slots	12	12	12
Maximum memory per server	384 GB	192 GB	384 GB
Networking ports (embedded)	(4) 1GbE	(2) 1GbE	(4) 1GbE
Maximum FlexibleLOM ports	None	None	None
Dedicated iLO/LO100 LAN port	Standard	Optional	Standard
Maximum drive bays (All drives are hot plug unless otherwise noted)	8 SFF SAS/SATA/SSD 4 LFF SAS/SATA/SSD	25 SFF SAS/SATA/SSD 14 LFF SAS/SATA/SSD	277 SFF SAS/SATA/SSD 147 LFF SAS/SATA/SSD
Maximum internal storage	12 TB	42 TB	42 TB
I/O expansion slots	1 PCle 2.0 1 PCle 3.0	4 PCIe	
Form factor	1U rack	2U Rack	2U Rack
Management	HP iLO Management Engine (standard)	HP LO100i (standard)	
Warranty, year(s) (parts/labor/onsite)	3/1/1	3/0/0	3/1/1

For Operation System Support information, visit hp.com/go/ossupport

For additional details on supported options, visit the server QuickSpecs at hp.com/go/quickspecs.

⁷ Requires two rear drive cages

HP ProLiant Servers—300p series

THE data center standard with leading performance and versatility









	ML350 G6	ML350p Gen8	ML370 G6/DL370 G6
	Adaptable, reliable mainstay for your business	Best-in-class performance with maximum expandability	4U rack or tower server fine-tuned for virtualization and consolidation environments, well-suited for remote office sites or data centers
Number of processors	1 or 2	1 or 2	1 or 2
Maximum number of cores	12	16	12
Processor family	Intel® Xeon® 5600 series Intel® Xeon® 5500 series	Intel® Xeon® E5-2600	Intel® Xeon® 5600 series Intel® Xeon® 5500 series
Maximum processor frequency	3.2 GHz	3.3 GHz	3.6 GHz
Memory slots	18	24	18
Maximum memory per server	288 GB	768 GB	384 GB
Networking ports (embedded)	(2) 1GbE	(4) 1GbE	(4) 1GbE Optional (2) 10GbE
Maximum FlexibleLOM ports	None	None	None
Dedicated iLO/LO100 LAN port	Standard	Standard	Standard
Maximum drive bays (All drives are hot plug unless otherwise noted)	16 SFF SAS/SATA/SSD 8 LFF SAS/SATA/SSD 6 LFF SAS/SATA	24 SFF SAS/SATA/SSD 18 LFF SAS/SATA/SSD	24 SFF SAS/SATA/SSD 14 LFF SAS/SATA/SSD
Maximum internal storage	24 TB	54 TB	42 TB
I/O expansion slots	6 PCIe 2.0	1 PCIe 2.0 8 PCIe 3.0	1 PCIe 9 PCIe 2.0 Optional 2 PCI-X
Form factor	5U tower or 5U rack	5U tower or 5U rack	4U tower or 4U rack
Management	HP iLO 2 (standard)	HP iLO Management Engine (standard)	HP iLO 2 (standard)
Warranty, year(s) (parts/labor/onsite)	3/3/3	3/3/3	3/3/3

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