Family guide

HP ProLiant rack and tower servers

Twenty-five years of HP ProLiant innovation



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A fresh approach to servers

Technology with the power to transform—to find new markets, to help the workforce discover new potential, to free up time and capital for innovation—is what the enterprise demands from IT today.

IT can deliver on those demands by leveraging the potency of key mega trends—the cloud, mobility, Big Data, and security—to generate new business opportunities. IT's response to these trends enables line of business executives to:

- Increase operational efficiencies
- Deliver new products and services faster
- Grow revenue, margin, and market share

For example, supporting a mobile workforce and customer base is no longer an option for IT—it's a necessity. However, mobility is a considerable challenge for IT organizations constrained by complex, siloed infrastructure. These constraints create technology gaps that lead to inefficiencies and slow response times, and ultimately to decreased productivity and customer satisfaction.

Addressing these gaps requires something fresh and unique. Something that converges compute, storage, and networking into shared resource pools. The new approach must also use software-defined technology to automate day-to-day tasks and save countless hours of time. And of course, the approach must be cloud-ready to enable fast changes, seamless scaling, and Always-On access. With such a compute model:

- IT operations must be ensured that their infrastructure is positioned for cost-effective and expedient future growth, while meeting key performance measures for system performance.
- Technical infrastructure professionals need reduced complexities, better insight into system performance, and assurance that systems can be managed more productively to free up resources.
- Business executives must have workload-optimized performance to yield better outcomes, to quickly respond to new business opportunities, and to gain a greater competitive advantage.

The HP ProLiant server portfolio was designed to deliver on these needs and requirements, taking a broader view of the hardware, software, and services that provide the right compute for the right workload at the right economics—every time.



HP ProLiant ML family
Expandable tower servers; ideal choice for remote and branch offices and growing businesses.

HP ProLiant rack and tower servers and new Gen9 models

Continuing to deliver on our vision of industry-leading compute innovation, HP introduces the HP ProLiant Gen9 portfolio. Building on 25 years of innovation and proven features and functions, the HP ProLiant Gen9 portfolio is designed to improve economics with more compute per watt per dollar to meet the new demands of today's marketplace.

Leveraging the advancements of the HP ProActive Insight Architecture for automation and management, ProLiant Gen9 is founded on the user-inspired innovations built into the ProLiant Gen8 portfolio, including:

- **HP Smart Socket guides**—Simplified access, easy processor updates
- **HP SmartDrives**—Simplified monitoring, reduced data loss, better serviceability
- **HP SmartMemory**—Improved performance, manageability, efficiency; reduced downtime; lower energy costs
- **HP Flexible Network adapters**—Easy configuration, fast serviceability
- **HP ProLiant 3D Sea of Sensors**—Lower energy costs
- **HP iLO 4 Management**—Rapid deployment, streamlined management
- **HP OneView**[1]—Accelerated IT service delivery through automated configuration and lifecycle management, faster virtual machine (VM) provisioning, and the ability to help accelerate the transition to Infrastructure-as-a-Service (IaaS) and hybrid cloud

HP ProLiant Gen9 delivers much more

Additional new technologies and improvements for ProLiant Gen9 that help you choose the right compute, for the right workload, with the right economics every time include:

- **More compute capacity and lower total cost of ownership (TCO) across multiple workloads**
  - 2X more compute per watt using 12 GB/s SAD SSD and HP DDR4 SmartMemory[2]
  - Tailored compute with flexible choices in storage, networking, and power options
  - Up to 3X more compute per square foot with unique HP PCIe Workload Accelerators[3]

- **Faster workload deployment with simple automation**
  - Faster setup, monitoring, and firmware maintenance with reliable, secure embedded management
  - Faster provisioning with simplified converged management using HP OneView
  - The ability to deliver infrastructure and application services in minutes with HP CloudSystem

- **Accelerated workload performance for delivering better business results**
  - One million IOPS supported with 12 GB controllers[4]—providing more throughput on mission-critical data
  - Up to 4X read and write workload acceleration with HP SmartCache,[5] which accelerates performance for quicker data access
  - 2X increase in networking bandwidth with HP Virtual Connect[6]

[1] HP OneView support for HP ProLiant Gen9 rack (DL) and blade (BL) servers will be available with HP OneView 1.20 in Dec 2014. Customers may purchase HP OneView licenses now, and will be granted rights to use HP Insight Control software and transition to HP OneView with a free upgrade, when available. Customers also have the option to purchase HP Insight Control.

[2] HP Internal analysis. Comparison between DL380 Gen9 vs. DL380 G7. Source for system wattage was IDC Qualified Performance Indicator. Performance taken from SPECint_rate_base2006 industry benchmark. Calculation: performance/watt, August 2014.

[3] Internal analysis. Comparison between DL380 Gen9 vs. DL380 G6. Dimensions extracted from DL380 QuickSpecs for Gen9 and G6 respectively. Performance taken from SPECint_rate_base2006 industry benchmark. Calculation: performance/(length/width)/144, August 2014.

[4] Internal performance lab testing using Iometer and the HP Smart Array P840 with RAID 0, 4k random reads, Microsoft® Windows® 2012 R2; testing is ongoing with changes in FW. Number is current as of 21 July 2014.

[5] HP SmartCache Performance done with equivalent controller in a controlled environment. HP Smart Storage engineers, Houston, TX as of 18 May 2014, posted on internal SmartCache wiki page.

[6] Based on Demartek testing. 10 Gb previous vs. 20 Gb with HP Virtual Connect FlexFabric 20/40.



HP ProLiant DL family
Versatile, rack-optimized server with a balance of efficiency, performance, and management.

Introducing new Gen9 server models
With the first wave of Gen9 servers, we added five new models to the rack and tower portfolio, with more to come.

- **HP ProLiant DL160 Gen9**—Right-sized performance and storage for space and budget-constrained environments
- **HP ProLiant DL180 Gen9**—The new standard for growing data center needs
- **HP ProLiant DL360 Gen9**—Dense performance for multi-workload computes in the data center
- **HP ProLiant DL380 Gen9**—The no-compromise data center standard for multi-workload compute
- **HP ProLiant ML350 Gen9**—High performance with unmatched capacity and reliability

In the ProLiant Gen8 family, the e (Essential) and p (Performance) designations were assigned to various server models. Those labels are not used with ProLiant Gen9 servers. The new family offers right-sized compute to meet your workload needs. As such, we're tailoring compute to offer more flexibility and choice, such as HP FlexibleLOM, HP SmartMemory, HP SmartCache, and many more options.

Current models	Transition models
HP ProLiant DL360e Gen8	HP ProLiant DL160 Gen9
HP ProLiant DL380e Gen8	HP ProLiant DL180 Gen9
HP ProLiant DL360p Gen8	HP ProLiant DL360 Gen9
HP ProLiant DL380p Gen8	HP ProLiant DL380 Gen9
HP ProLiant ML350p Gen8	HP ProLiant ML350 Gen9

Why choose HP rack and tower servers?
To meet the growing demands of your business, HP ProLiant rack and tower servers redefine compute economics by delivering more compute and storage capacity, right-sized compute with flexible choices, and lower compute energy and floor space consumption. With HP ProLiant rack and tower servers, you can accelerate your business results with faster compute, memory, and I/O performance, coupled with increased storage and networking performance—including lower latency.

HP ProLiant rack and tower servers are available in the three families described below. While all three families are designed to handle multiple workloads—IT infrastructure, Web, business applications, collaboration, analytics, Big Data, and more—each family is optimized for specific use cases.

HP ProLiant MicroServer family of servers
HP ProLiant MicroServer models provide small- to medium-sized businesses (SMBs) with a right-fit first server solution.

HP ProLiant tower servers (ML family)
Integrated with a simplified yet comprehensive management suite and industry-leading support, the ProLiant Tower Portfolio delivers more business value, helps increase IT staff productivity, and expedites service delivery. In addition, the tower ecosystem offers a complete right-sized portfolio of financing options, service offerings, and a channel network to significantly increase the speed of IT operations, as well as enable your IT to respond to business needs more quickly and efficiently.

HP ProLiant rack servers (DL family)
Offering a versatile design, flexible choices, and improved energy efficiencies, ProLiant rack servers lower costs across the board. Integrated with a comprehensive management suite and industry-leading support, the ProLiant Rack Portfolio delivers a more reliable and secure infrastructure, helps increase IT staff productivity, and accelerates service delivery. In addition, these optimized rack servers are performance optimized for multi-application workloads. With ProLiant Gen9 rack servers, you can significantly increase the speed of IT operations and enable IT to rapidly respond to any business need.

Which operating systems/virtual environments are supported?

HP ProLiant rack and tower servers support the following operating systems and virtual environments:

- Microsoft
- Red Hat®
- SUSE
- Oracle
- Canonical

You can purchase your entire operating environment from HP; we resell and provide full service and support for Microsoft Windows operating systems; Red Hat Enterprise Linux® subscriptions; SUSE Linux subscriptions; and Microsoft Hyper-V, VMware®, and Red Hat Enterprise Virtualization subscriptions.

For the latest operating system support information and to learn more, visit hp.com/go/ossupport.

Choose your rack or tower server

HP ProLiant rack and tower servers are available in a variety of models to support different compute needs and workloads. The following charts will help you compare and contrast the offerings within the HP ProLiant rack and tower families. These charts are organized according to server needs:

- New to servers—four models
- Facing IT growth—eight models
- With traditional IT requirements—seven models
- Needing to scale up—four models

New to servers

Are you new to servers? Consider these HP ProLiant Essentials servers.

	 **MicroServer** Ideal first low-cost server for collaboration, centralization, and command of your business	 **MicroServer Gen8** Ideal first server for collaboration, centralization, and command of your business with remote management capabilities	 **ML10 Gen8** Single-socket 4U tower delivers value for SMB	 **DL320e Gen8 v2** Compact single application server, suitable for deployment anywhere
Number of processors	1	1	1	1
Processors supported	AMD Turion II	Intel® Xeon® E3-1200L v2 Intel® Pentium® Intel® Celeron®	Xeon E3-1220 v2 Intel Pentium G2130	Intel Xeon E3-1200 v2 Intel® Core™ i3 Intel Pentium
Cores per processor	2	2	2	2/4
Maximum processor frequency/cache	2.2 GHz/2 MB	2.5 GHz/3 MB	3.2 GHz/3 MB	3.7 GHz/8 MB
I/O expansion slots	2 PCIe 2.0	1 PCIe 3.0/2.0 (processor dependent)	Up to 4 PCIe 2.0	Up to 2 PCIe 3.0
Maximum memory/# slots	8 GB/2	16 GB/2	32 GB/4	32 GB/4
Storage controller (embedded)	AMD SATA or eSATA	B120i*	B110i*	B120i*
Maximum storage drive bays	4 LFF SATA, non-hot plug	4 LFF SATA, non-hot plug	3 LFF + 1 Optical Drive convert to LFF, non-hot plug, HDD/SSD	2 LFF or 4 SFF HDD/SSD
Maximum internal storage	8 TB	12 TB	8 TB	8 TB
Networking ports (embedded)/FlexibleLOM	1 x 1GbE/NA	2 x 1GbE/NA	1 x 1GbE/NA	2 x 1GbE/NA
VGA/serial/USB ports/SD	1/0/7/0	1/0/7/1	1/0/7/0	1/0/7/1
GPU support	None	None	None	N/A
Form factor	Ultra Micro Tower	Ultra Micro Tower	Micro ATX Tower (4U)	Rack (1U)
Management	Optional MicroServer Remote Access Card	HP iLO 4, HP iLO Essentials (optional)	HP iLO 3, HP iLO Advanced (optional)	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	1/0/0	1/0/0	1/1/1	1/1/1

* For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.

Growing IT needs

Are your IT needs growing? Consider these HP ProLiant Essentials servers.



ML310e Gen8 v2
Full-featured 1P tower with enterprise-class manageability



ML350e Gen8 v2
Essential performance with room to grow



DL320e Gen8
Ideal single application and IT infrastructure server

Number of processors	1	1 or 2	1
Processors supported	Intel Xeon E3-1200 v3 Intel Core i3 Intel Pentium	Intel Xeon E5-2400 v2 Series	Intel Xeon E3-1200 v2 Intel Pentium
Cores per processor	2/4	4/6/8/10	2/4
Maximum processor frequency/cache	3.6 GHz/8 MB	2.5 GHz/25 MB	3.7 GHz/8 MB
I/O expansion slots	Up to 2 PCIe 3.0, 2 PCIe 2.0	Up to 2 PCIe 2.0, 4 PCIe 3.0	Up to 1 PCIe 3.0, 1 PCIe 2.0
Maximum memory/# slots	32 GB/4	192 GB/12	32 GB/4
Storage controller (embedded)	B120i*	B120i*	B120i*
Maximum storage drive bays	4 LFF or 8 SFF HDD/SSD	4 LFF or 8 LFF or 16 SFF HDD/SSD	4 LFF or 8 SFF HDD/SSD
Maximum internal storage	16 TB	32 TB	16 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/NA	2 x 1GbE/NA	2 x/NA
VGA/serial/USB ports/SD	1/1/8/1	1/1/8/1	1/1/7/1
GPU support	None	NVIDIA Quadro K2000 PCIe Graphics Adapter	N/A
Form factor	Micro ATX Tower (4U) with optional rack conversion tray kit (4U)	Tower (5U) with optional rack conversion tray kit	Rack (1U)
Management	HP iLO 4, HP iLO Essentials (optional)	HP iLO 4, HP iLO Essentials or Advanced (optional)	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	1/1/1 Worldwide 3/1/1 Brazil	1/1/1	1/1/1

* For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.

Growing IT needs (continued)

Are your IT needs growing? Consider these HP ProLiant Essentials servers.

	 **DL160 Gen9** Right-sized performance and storage for space and budget-constrained environments	 **DL360e Gen8** Essential features in an optimized design	 **DL160 Gen8** High-performance computing with increased manageability in a dense 1U design
Number of processors	1 or 2	1 or 2	1 or 2
Processors supported	Intel Xeon E5-2600 v3 Series	Intel Xeon E5-2400 Series Intel Xeon E5-2400 v2 Series	Intel Xeon E5-2600 Series
Cores per processor	4†/6/8/10/12	4/6/8/10	4/6/8
Maximum processor frequency/cache	3.0 GHz†/30 MB	2.5 GHz/25 MB	2.9 GHz/20 MB
I/O expansion slots	Up to 3 PCIe 3.0	Up to 1 PCIe 2.0, 1 PCIe 3.0	Up to 2 PCIe 3.0
Maximum memory/# slots	512 GB/16	384 GB/12	768 GB/24
Storage controller (embedded)	B140i*	B120i*	B120i*
Maximum storage drive bays	4 LFF or 8 SFF HDD/SSD	4 LFF or 8 SFF HDD/SSD	4 LFF or 8 SFF HDD/SSD
Maximum internal storage	24 TB	16 TB	16 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/Optional FlexibleLOM slot on riser†	4 x 1GbE**/NA	2 x 1GbE***/Optional FlexibleLOM slot
VGA/serial/USB ports/SD	1/0/4/1	2/1/7/1	2/1/7/1
GPU support	N/A	*	*
Form factor	Rack (1U)	Rack (1U)	Rack (1U)
Management	HP iLO 4, HP RESTful interface tool and UEFI; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView§	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	3/1/1	3/1/1	3/0/0 Worldwide 3/1/1 APJ

* For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.
** Quad-port network interface card standard, with the option to upgrade with a variety of networking options.
*** Embedded dual-port network adapter; the server can be further upgraded with various networking products.
† Support to be available by early 2015.
§ HP OneView support for HP ProLiant Gen9 rack (DL) and blade (BL) servers will be available with HP OneView 1.20 in Dec 2014. Customers may purchase HP OneView licenses now, and will be granted rights to use HP Insight Control software and transition to HP OneView with a free upgrade, when available. Customers also have the option to purchase HP Insight Control.

Growing IT needs (continued)

Are your IT needs growing? Consider these HP ProLiant Essentials servers.



DL180 Gen9
The new standard for growing data center needs



DL380e Gen8
Compute and storage ideal for essential data center needs

Number of processors	1 or 2	1 or 2
Processors supported	Intel Xeon E5-2600 v3 Series	Intel Xeon E5-2400 Intel Xeon E5-2400 v2 Series
Cores per processor	4†/6/8/10/12	4/6/8/10
Maximum processor frequency/cache	3.0 GHz†/30 MB	2.5 GHz/25 MB
I/O expansion slots	Up to 6 PCIe 3.0	Up to 1 PCIe 2.0, 5 PCIe 3.0
Maximum memory/# slots	512 GB/16	384 GB/12
Storage controller (embedded)	B140i*	B120i*
Maximum storage drive bays	12 LFF or 16 SFF HDD/SSD	14 LFF or 27 SFF HDD/SSD
Maximum internal storage	72 TB	56 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/Optional FlexibleLOM slot on riser†	4 x 1GbE/NA
VGA/serial/USB ports/SD	1/0/4/1	1/1/7/1
GPU support	N/A	N/A
Form factor	Rack (2U)	Rack (2U)
Management	HP iLO 4, HP RESTful interface tool and UEFI; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView§	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	3/1/1	3/1/1

*For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.
† Support to be available by early 2015.
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Traditional IT needs

Are you continuing to need traditional IT? Consider these HP ProLiant Performance servers.



ML350 Gen9
High performance with unmatched capacity and reliability



ML350p Gen8
Best-in-class performance with maximum expandability



DL360 Gen9
Dense performance for multi-workload computes in the data center



DL360p Gen8
Performance-driven compute and storage density

	ML350 Gen9	ML350p Gen8	DL360 Gen9	DL360p Gen8
Number of processors	1 or 2	1 or 2	1 or 2	1 or 2
Processors supported	Intel Xeon E5-2600 v3 Series	Intel Xeon E5-2600 Intel Xeon E5-2600 v2 Series	Intel Xeon E5-2600 v3 Series	Intel Xeon E5-2600 Intel Xeon E5-2600 v2 Series
Cores per processor	4/6/8/10/12/14/16/18	2/4/6/8/10/12	4/6/8/10/12/14/16/18	2/4/6/8/10/12
Maximum processor frequency/cache	3.4 GHz/45 MB	3.5 GHz/30 MB	3.5 GHz/45 MB	3.5 GHz/30 MB
I/O expansion slots	Up to 1 PCIe 2.0, 8 PCIe 3.0	Up to 1 PCIe 2.0, 8 PCIe 3.0	Up to 2 PCIe 3.0	Up to 2 PCIe 3.0
Maximum memory/# slots	1.5 TB†/24	768 GB/24	1.5 TB†/24	768 GB/24
Storage controller (embedded)	B140i*	P420i*	B140i*	P420i*
Maximum storage drive bays	24 LFF or 48 SFF HDD/SSD	18 LFF or 24 SFF HDD/SSD	8+2 SFF or 4 LFF HDD/SSD	4 LFF or 10 SFF HDD/SSD
Maximum internal storage	144 TB	72 TB	24 TB	16 TB
Networking ports (embedded)/FlexibleLOM	4 x 1GbE/NA	4 x 1GbE/NA	4 x 1GbE/Optional FlexibleLOM	4 x 1GbE or 2 x 10GbE/ Optional FlexibleLOM
VGA/serial/USB ports/SD	1/1/8/1	1/1/9/1	2/1/5/1	0/1/7/1
GPU support	Single/double-wide and active/passive up to 10.5" (4)	Single/double-wide (3)	Single-wide and active to 9.5" (2)	N/A
Form factor	Tower or rack (5U)	Tower or rack (5U)	Rack (1U)	Rack (1U)
Management	HP iLO 4, HP RESTful interface tool and UEFI; (optional) HP iLO Essentials or Advanced, or HP Insight Control	HP iLO 4; (optional) HP iLO Essentials or Advanced, or HP Insight Control	HP iLO 4, HP RESTful interface tool and UEFI; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView§	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	3/3/3	3/3/3	3/3/3	3/3/3

*For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.

† Support to be available by early 2015.

§ HP OneView support for HP ProLiant Gen9 rack (DL) and blade (BL) servers will be available with HP OneView 1.20 in Dec 2014. Customers may purchase HP OneView licenses now, and will be granted rights to use HP Insight Control software and transition to HP OneView with a free upgrade, when available. Customers also have the option to purchase HP Insight Control.

Traditional IT needs (continued)

Are you continuing to need traditional IT? Consider these HP ProLiant Performance servers.

	 **DL380 Gen9** The no-compromise data center standard for multi-workload compute	 **DL380p Gen8** The no-compromise data center standard	 **DL385p Gen8** Performance and flexibility that mean business
Number of processors	1 or 2	1 or 2	1 or 2
Processors supported	Intel Xeon E5-2600 v3 Series	Intel Xeon E5-2600 Intel Xeon E5-2600 v2 Series	AMD Opteron 6200 Series AMD Opteron 6300 Series
Cores per processor	4/6/8/10/12/14/16/18	2/4/6/8/10/12	4/8/12/16
Maximum processor frequency/cache	3.5 GHz/45 MB	3.5 GHz/30 MB	3.5 GHz/16 MB
I/O expansion slots	Up to 6 PCIe 3.0	Up to 1 PCIe 2.0, 5 PCIe 3.0	Up to 6 PCIe 2.0
Maximum memory/# slots	1.5 TB†/24	768 GB/24	768 GB/24
Storage controller (embedded)	B140i*	P420i*	P420i*
Maximum storage drive bays	24+2 SFF or 12+3 LFF HDD/SSD	25 SFF or 12 LFF HDD/SSD	25 SFF or 12 LFF HDD/SSD
Maximum internal storage	90 TB	48 TB	48 TB
Networking ports (embedded)/FlexibleLOM	4 x 1GbE/Optional FlexibleLOM	4 x 1GbE or 2 x 10GbE/Optional FlexibleLOM	4 x 1GbE or 2 x 10GbE/Optional FlexibleLOM
VGA/serial/USB ports/SD	1+1/1/6/1	2/1/7/1	2/1/8/1
GPU support	Single/double-wide and active/passive up to 10.5" (2)	Single/double-wide (2)	N/A
Form factor	Rack (2U)	Rack (2U)	Rack (2U)
Management	HP iLO 4, HP RESTful interface tool and UEFI; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView§	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView
Warranty—(years) (parts/labor/onsite)	3/3/3	3/3/3	3/3/3

*For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.

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Scale-up needs

Do you need to scale up? Consider these HP ProLiant Performance servers.

	 **DL560 Gen8** Concentrated compute without compromising on performance, scalability, and efficiency	 **DL580 Gen8** The enterprise standard for business-critical workloads	 **DL585 G7** Versatile workhorse for the evolving data center	 **DL980 G7** For your largest and most demanding enterprise-class workloads
Number of processors	1, 2, or 4	2, 3, or 4	2 or 4	4 or 8
Processors supported	Intel Xeon E5-4600 Series Intel Xeon E5-4600 v2 Series	Intel Xeon E7-4800 v2 Series Intel Xeon E7-8800 v2 Series	AMD Opteron 6300 Series AMD Opteron 6200 Series	Intel Xeon E7-2800 Series Intel Xeon E7-4800 Series
Cores per processor	4/6/8/10/12	6/8/10/12/15	4/8/12/16	6/8/10
Maximum processor frequency/cache	3.3 GHz/30 MB	3.4 GHz/37.5 MB	3.5 GHz/16 MB	2.4 GHz
I/O expansion slots	Up to 1 PCIe 2.0, 5 PCIe 3.0	Up to 9 PCIe 3.0	Up to 11 slots*	Up to 16 I/O slots
Maximum memory/# slots	1.5 TB/48	6 TB/90	1.5 TB/16	4 TB/128
Storage controller (embedded)	P420i*	P830i*	P410i*	P410i
Maximum storage drive bays	5 SFF HDD/SSD	10 SFF HDD/SSD	8 SFF HDD/SSD	8 SFF HDD/SSD
Maximum internal storage	8 TB	16 TB	9.6 TB	7.2 TB
Networking ports (embedded)/FlexibleLOM	4 x 1GbE or 2 x 10GbE FlexibleLOM	4 x 1GbE or 2 x 10GbE FlexibleLOM	4 x 1GbE, Optional 2 x 10GbE/NA	4 x 1GbE or 2 x 10GbE
VGA/serial/USB ports/SD	2/1/7/1	2/1/8/1	2/1/6/1	2/1/6/1
GPU support	*	(5) Double-Wide	(4) 225 W or (3) 300 W*	(4) or (3)
Form factor	Rack (2U)	Rack (4U)	Rack (4U)	Rack (8U)
Management	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView	HP iLO 4; (optional) HP iLO Essentials or Advanced, HP Insight Control, or HP OneView	HP iLO 3; (optional) HP iLO Advanced or HP Insight Control	HP iLO 3, HP iLO Advanced
Warranty—(years) (parts/labor/onsite)	3/3/3	3/3/3	3/3/3	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at hp.com/go/quickspecs.

Options for enhanced functionality and added benefits

Complete your data center with HP Qualified Options and IT infrastructure products and services—including processors, drives, accelerators, memory, controllers, racks, operating system software, and power and cooling. Strengthen the foundation of your data center with high-caliber products that are easy to maintain and tailored for HP ProLiant, HP Integrity, and HP Storage products, giving you confidence in your end-to-end infrastructure.

HP Qualified Options
Providing better performance, reliability, and compatibility with HP ProLiant, HP Integrity, and HP Storage systems. HP Qualified Options are also integrated with many HP system management tools, and they can help lower your operational costs, as compared to non-HP products.

PCIe Workload Accelerators
Supporting the applications in your data center environment that require the lowest latency response times and blazing IOPS performance. HP provides a wide range of performance, endurance, price, and capacity choices to meet the needs of your high-performance data center applications.

Data protection
HP StoreEver Tape fulfills long-term data retention needs by offering economical, simple, reliable, and secure solutions.

Flash media devices
If you require boot-from-flash for integrated hypervisors and Tier 1 operating systems, trust HP's high-performance enterprise flash media kits to meet those needs. With high data retention and read/write cycles, HP flash media devices are available in SD and microSD form factors.

Hard disk drives
Outstanding storage options for price advantages, high availability, and reliable data integrity for your mission-critical and non-mission-critical applications running on HP systems. Available in both SAS and SATA form factors, you can select from a variety of capacity points to meet your unique requirements.

Network adapters
Cost-effective, dependable computer networking products keep your IT running at peak performance. HP ProLiant IT networking products were designed, developed, and tested to deliver state-of-the-art networking technology.

Optical drives
Available as both DVD-ROM and DVD-RW solutions, HP optical drives are available in half-height, slim, and super-slim models to fit any HP system in your data center.

Power supplies
Modular and highly efficient options for your HP server, storage, and networking solutions. HP power supplies offer support for multiple input voltages to meet all your data center power requirements.

Smart Array Controller
With data storage requirements growing rapidly, you need a high-capacity storage solution that meets your performance and availability demands. Scalability, data reliability, and accessibility needs must also be met. To fulfill these needs while also improving your storage utilization, look to the HP ProLiant Smart Array Controllers. New for the HP ProLiant Gen9 servers are 12 Gb/s Smart Array Controllers, which deliver increased performance and choice, as well as offer other significant benefits that can help you make better use of your storage environment.

Smart Host Bus Adapters
HP Smart Host Bus Adapters (HBAs) offer low cost, high performance and scalability for direct-attached storage with basic RAID functionality, as well as shared storage support.

HP SmartMemory
Offering the same high quality, reliability, and confidence you have come to expect from HP ProLiant servers. As an HP Qualified Option, HP SmartMemory is thoroughly tested beyond standard industry practices to ensure compatibility, performance, longevity, and reliability.

Solid-state drives
HP enterprise solid-state drives (SSDs) are best suited for enterprise workloads that require significantly better random read/write performance than provided by rotating hard disks. HP enterprise SSDs offer the key features to meet your enterprise needs—full data path error detection, surprise power loss protection, and SMARTSSD Wear Gauge support.

IT infrastructure products and services
Highly efficient and intelligent solutions for existing and new data centers. Performance-optimized data centers (PODs) provide outstanding flexibility for a variety of technology deployments. As an industry leader, HP is uniquely positioned to address the key concerns of power, cooling, cable management, and system access.

HP rack infrastructure
As the foundation for long-term IT success, these HP products help you react to changes in the industry through efficient, easy-to-use capabilities to manage, monitor, deploy, and provision IT infrastructure.

HP power protection and management
Choose from a variety of easy-to-use solutions for all your power needs, including power protection, extended server runtime, distribution, management, and monitoring.

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

HP infrastructure management software

For insight and control of your computer resources
Today, most IT professionals wrestle with numerous management pains, including:

- **Infrastructure management complexity**—There are too many infrastructure management tools to learn and operate, resulting in high IT operating expenses. This proliferation drives up software license costs, as well as increases the time and cost of maintenance—including skills maintenance.
- **Scale and speed**—In enterprise data centers with thousands or tens of thousands of servers, traditional infrastructure management tools cannot scale or operate at the high speeds necessary to effectively manage server sprawl.
- **Siloed infrastructure and outdated IT operational models**—There are often too many non-standard manual tasks, an over-reliance on subject matter experts, and an ever-expanding backlog of projects. The answer to these challenges is to follow a new IT operational model—namely the software-defined data center (SDDC).
- **Planned and unplanned downtime**—Depending on the line of business, the cost of downtime can be millions of dollars of lost revenue. Knowing these costs, IT pros need tools and processes designed to eliminate or dramatically reduce downtime created by planned or unplanned incidences.

To address these gaps and others not mentioned here, a new management methodology is required—one that drives better system control and greater insight into problems before they occur. And HP has it.

HP infrastructure management is delivered through a complete portfolio of HP ProLiant lifecycle management capabilities that can flexibly operate from embedded on-system utilities, on-premise for software-defined data centers, and now also from the cloud. Managing HP ProLiant servers with HP infrastructure management results in increased efficiency and precise control of resources. With a rich set of capabilities that are easy to access and simple to use, HP infrastructure management encompasses critical areas such as server deployment and configuration, health and alerting, energy, power and remote management, and warranty and contract information access via a cloud-based portal. The core components that make up HP infrastructure management are HP OneView, HP iLO Management, and HP Insight Online. With HP infrastructure management's built-in automation, HP ProLiant servers are so intelligent they practically manage themselves.

In addition, HP Service Pack for ProLiant and HP Smart Update Manager (HP SUM) provide breakthrough system maintenance tools that systematically update HP ProLiant rack and tower servers with one-click simplicity at the scale of your data center.

For complete information on the HP Server Management portfolio, refer to the family guide at hp.com/go/servermanagement.

HP OneView

Eliminating infrastructure complexity with automation simplicity

Based on a unique architecture, HP OneView speeds IT service rollouts and helps actively prevent error-induced downtime through a template-based, software-defined approach to management.

And HP OneView saves time by acting as an automation hub that performs infrastructure configuration and management tasks at the request of other applications. HP OneView is:

- **Converged**—Manage across compute, storage, and networking and enjoy a 50 percent reduction in tools to learn, manage, deploy, and integrate.[7]
- **Software-defined**—Capture best practice knowledge in templates to guarantee that infrastructure is deployed and managed the right way every time.
- **Automated**—Use HP OneView REST application programming interfaces (APIs) to deploy a VMware vSphere cluster in just five easy steps[8] and leverage HP OneView as the infrastructure automation hub for your enterprise.

HP iLO Management

Embedded management for the full server lifecycle

HP iLO Management is a complete set of embedded management features supporting the full lifecycle of the server—from initial deployment through ongoing management to service alerting and support. By delivering comprehensive embedded management, HP iLO helps you speed time-to-deployment, maximize server and application availability through proactive notification, and dramatically accelerate time-to-resolution when issues arise.

Licensing provides additional HP iLO functionality, such as graphical remote console, multi-user collaboration, and video record/playback, along with many advanced features.

HP Insight Online

Support from anywhere, at any time

HP Insight Online is a cloud-based infrastructure management and support portal available through the HP Support Center and powered by HP remote support technology. It provides a personalized dashboard for simplified tracking of IT operations and support information from anywhere, at any time.

You can use the Insight Online dashboard to track service events and support cases, view device configurations, and proactively monitor your HP contracts and warranties, as well as your HP Proactive Service credit balances.

[7] Based on HP internal analysis, May 2014, comparing OneView 1.10 vs. the traditional approach to infrastructure management requiring eight tools.

[8] Determined during HP internal testing in January 2014, comparing HP OneView 1.05 with the HP Insight Control for VMware vCenter Server v7.30 plugin vs. traditional HP management tools.

HP storage solutions for HP ProLiant servers

You can gain the full value from your investments when you choose advanced HP storage devices, such as fabric switching, disk enclosures, and shared storage. HP also offers backup systems, tape drives, auto loaders, and libraries for backup or disaster recovery.

HP StoreFabric SAN switches
Choose from a wide range of Fibre Channel switches, multi-protocol routers, Host Bus Adapters, Converged Network Adapters, and cables and optics for your SAN. These offerings deliver the scalability, performance, and broad interoperability that your mission-critical data and applications demand. Combining ease-of-use, flexibility, and improved security with cost-effective pricing, these switches are key enablers of your dynamic and adaptive storage-networking environment. hp.com/go/SAN

HP disk enclosures
Is your storage growing by leaps and bounds, exceeding your current system capacity? Manage your growing storage needs by deploying low-cost, high-capacity/high-performance external storage disk enclosures—the ideal choice for small application environments in small- to medium-sized businesses, remote offices, and departmental locations. hp.com/go/disk-enclosures

HP shared storage
When it comes to storage, HP has the broadest and most comprehensive portfolio in the industry, featuring external shared storage that scales capacity and performance as your business grows. With easy-to-use Windows-based NAS file and print solutions for SMBs, through modern scale-out Tier 1 arrays for the most demanding data centers, HP has a storage solution to fit your exact needs and budget. hp.com/storage

HP backup systems
Remove the time and frustration from backup and disaster recovery across your enterprise. HP StoreOnce Backup is the only federated deduplication solution to provide leading disk-based backup for the full spectrum of IT environments—from small remote sites to large enterprises. Seamlessly integrating with your current backup applications, HP StoreOnce Backup provides flexible integration for NAS, SAN, and virtualized environments. hp.com/go/storeonce

HP tape drives, autoloaders, and libraries
Tape plays a critical role in the storage strategy for companies of all sizes. Combined with disk storage in a multi-tier protection strategy, HP tape products offer a storage solution with low total cost of ownership. Tape is also portable, making it ideal for secure offsite and offline backup, disaster recovery, data compliance, and long-term archiving. hp.com/go/tape

Integration services

HP Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications in the factory—helping speed deployment. hp.com/go/factoryexpress

Training and certification

Gain the skills you need with ExpertOne training and certification from HP. With HP ProLiant server training, you will accelerate your technology transition, improve operational performance, and get the best return on your HP investment. Our training is available when and where you need it, through flexible delivery options and a global training capability. hp.com/learn/proliant

HP Technology Services

With technology evolving at a rapid pace, it is increasingly important for you to rely on IT support services that are constantly adapting and evolving, too. The HP Support Services portfolio for HP ProLiant servers and HP BladeSystem redefines support, factoring in the breakthrough capabilities of HP ProLiant core rack and tower servers.

HP offers a comprehensive set of services to manage and optimize every aspect of the server environment. Our HP Lifecycle Event services include working with your IT team to design your environment from scratch or to integrate new technology into your existing infrastructure. Our services are designed for virtualized, converged environments, to help you get systems up and running quickly, and to provide ongoing reactive and proactive support.

- **HP Foundation Care**—Cost-effective, reactive services with separate or integrated hardware and software support options; includes HP Collaborative Support with independent software vendor (ISV) software problem resolution and enhanced call management.
- **HP Proactive Care**—Combines reactive and proactive hardware and software support; offers a single point of contact for remote and onsite hardware support delivered by advanced HP technology experts to help you proactively address potential issues and minimize downtime.
- **HP Data Center Care**—Supports your entire data center environment; developed for environments that have HP and multi-vendor equipment; customized for your needs and service-level agreements (SLAs).
- **HP Lifecycle Event Services**—Comprehensive end-to-end services, covering strategy, planning, deployment, technical, and education services that can be used at any stage of the solution lifecycle.

Through this portfolio of services, HP can help you align support service levels to your business needs worldwide—while also saving you costs and resources. With HP, you receive the right support for the new age, benefiting from a support experience that is personalized, proactive, and simplified. hp.com/services/proliant

For customer service training visit hp.com/learn/proliant or contact your local HP sales representative or authorized HP ServiceOne Partner.

The undisputed server market leader
With one HP ProLiant server shipping every 11.6 seconds[9] and more than 32 million sold, HP ProLiant servers are the undisputed market share leader.[10] The industry-leading success of HP ProLiant stems in part from our ongoing commitment to providing a complete industry-standard server infrastructure that delivers innovation, quality, and proven performance.

[9] IDC Server Tracker CQ2, 2013.
[10] IDC CQ2, 2013. HP has shipped more than 32.3 million servers through CQ2, 2013.

HP server families

A server for every need
HP understands that when it comes to servers, one size does not fit all. That's why we offer you a comprehensive array of server families, purpose-built for a wide variety of business needs. Explore our other server portfolios:

- **HP BladeSystem Family**—Delivering a whole new experience for IT with the Power of One—one infrastructure and one management platform to speed the delivery of services
- **HP Moonshot System Family**—The industry's first workload-optimized server—designed for the data center and built for the planet
- **HP Hyperscale Solutions Family**—When your IT is the core of your business
- **HP Integrity Server Family**—When you need continuous business, Integrity servers help you achieve mission-critical results
- **HP NonStop Server Family**—For industries that never stop
- **HP Server Management Family**—Improve efficiency and accelerate service delivery

To learn more about how HP ProLiant core rack and tower servers—together with Qualified Options and HP Services—can help you confidently lay the foundation for your converged infrastructure visit hp.com/go/proliant.

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