Hewlett Packard Enterprise

Family guide

HPE ProLiant rack and tower servers

The world's most secure industry standard servers[1]

A new compute experience simplifying hybrid cloud

We're living in an era of digital disruption, where the accessibility and adoption of **Big Data**, **mobility**, **Internet of Things**, and **cloud-native technologies** are enabling companies to transform their businesses in exciting new ways. At the heart of these technologies are applications and data, and this has placed IT at the center of business innovation.

IT needs to operate at the speed of today's business, to be an accelerator of new ideas, products, and services. For IT to be successful in speeding time to value, a **hybrid cloud infrastructure** is needed in order to deliver the Right Mix of infrastructure and services to develop and deploy applications on a continuous basis and draw insights and make decisions from data.

For IT decision-makers who must define their Right Mix of hybrid cloud across on-premises dedicated and cloud environments as well as hosted cloud, a new compute experience is required to obtain cloud economics and agility with the security of an on-premises data center. HPE ProLiant servers are designed to simplify hybrid cloud by providing the agility of a modernized infrastructure, the security to protect your digital assets and the economic control to pay for only what your use.

[1] Based on external firm conducting cybersecurity penetration testing of a range of server products from a range of manufacturers, May 2017.

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A complete compute solution
Choose HPE Rack and Power Infrastructure options to complete your foundation for a modern and optimized IT environment. Hewlett Packard Enterprise delivers the right value where it matters, with:

- Racks in a variety of height, width, and depth options
- Power distribution units (PDUs) ranging from enterprise to basic
- Various sizes of uninterruptable power supplies (UPSs)
- Kernel-based virtual machine solutions and other rack accessories

For a list of HPE Small Business Solutions including additional information, refer to **hpe.com/info/smb/servers** (Solutions tab)

[2] 50%—Reduces time to migrate an existing server to a new OS from 24 hours to just 12. HPE internal testing, October 2018.

[3] 33%—Reduces time to install and set up a new server from 6 hours to just 4. HPE internal testing, October 2018.

Agility: Deliver business results with a software-defined infrastructure that delivers intelligent automation and high performance reducing operational complexity for traditional applications while increasing velocity for the new breed of applications.

Security: Protect your business and data with an infrastructure that has security designed in from the start.

Economic control: Consume IT paying only for what you use, scaling on demand without overprovisioning or incurring exponentially escalating costs.

Why choose HPE ProLiant rack and tower servers?

HPE is committed to innovation, quality, and an excellent customer experience. Our approach to excellence in our innovation and quality is instilled across the product lifecycle, from our customer-first approach to design, to our supplier selection, quality and management, to our world-class manufacturing and rigorous product testing, to our global support services and network of channel partners.

With **HPE ProLiant rack** and **tower servers**, you can deliver consistent and predictable agility, security, and economic control across your **hybrid cloud** infrastructure.

The rack and tower servers are available in these families:

- HPE ProLiant MicroServer
- HPE ProLiant ML
- HPE ProLiant DL

While all three families are designed to handle multiple workloads, each family is optimized for specific use cases.

As business grows and needs change, businesses want solutions that can scale with them on their journey. Our new SMB ProLiant Offers are developed specifically with our customers in mind: they allow for quick deployment, are competitively priced, and are right-sized. These SMB Offers are regionally deployed as HPE Smart Buy Express Offers (NA), Top Value Offers (EMEA), or Intelligent Buy Offers/Intelligent Buy Express Offers (APJ) and are available on the ProLiant MicroServer, ML, and DL Servers. A key part of this portfolio of SMB ProLiant Offers are HPE Small Business Solutions built for on-premises and for hybrid cloud. To make server deployment easy and fast, we offer HPE SMB Setup, formerly called Rapid Setup Software. HPE SMB Setup is now part of Intelligent Provisioning. It is a simple, guided process for consistent system installation, setup, and configuration—**offering 50% faster**[2] **migrations and 33.3% faster installs**.[3]

HPE ProLiant MicroServer
Compact, quiet and stylish, the HPE ProLiant MicroServer is ideal as a first solution for small businesses. With just right performance in a form factor that is easy to use and service, the MicroServer helps you drive down expenses while improving productivity and efficiency. And best of all, you don't need a server room to have a server.

The HPE ProLiant MicroServer **Gen10** supports 4K streaming media with dual display ports and comes with HPE Rapid Setup Software on a USB drive, on select models enabling quick install of ClearOS™, an easy-to-use operating system and applications just right for SOHO.

HPE ProLiant MicroServer
Perfect for micro and small businesses

HPE ProLiant ML family
The ideal choice for remote or branch offices and growing businesses

HPE ProLiant DL family
Secure and versatile rack-optimized servers delivering performance, expansion, and manageability

The HPE ProLiant MicroServer provides the following benefits:

- Easy to set up and service
- Cool design and ability to place it anywhere

HPE ProLiant Gen10 tower servers
The ML family of servers delivers simple, efficient business value and is the ideal choice for remote or branch offices and growing businesses. Industry-leading compute innovations include simple management and storage tools, along with proven configurations that provide easy remote access and improved energy efficiencies to lower your total cost of ownership (TCO). Integrated with a simplified but comprehensive management suite and industry-leading support, the ProLiant tower portfolio delivers more business value and helps increase IT staff productivity and expedite service delivery. In addition, the complete, right-sized tower portfolio includes financing options, IT infrastructure support options, and a channel network to significantly increase the speed of IT operations and enable IT to respond to business needs faster.

The HPE ProLiant tower portfolio delivers:

- Simplicity with easy-to-use tools, processes, and support to help server administrators keep hardware running
- Efficiency that office managers need to help improve employee productivity
- Affordability to increase business agility and help acquire and retain customers

HPE ProLiant Gen10 rack servers
The DL family of servers are the most flexible, reliable, and performance-optimized ProLiant rack servers—ever. HPE continues to provide industry-leading compute innovations. The new HPE ProLiant Gen10 rack portfolio, with flexible choices and versatile design, along with improved energy efficiencies, ultimately lowers your TCO. Integrated with a simplified, but comprehensive management suite and industry-leading support, the ProLiant Gen10 rack portfolio delivers a more reliable, fast, and secure infrastructure solution, helps increase IT staff productivity, and accelerates service delivery. In addition, the rack portfolio is performance-optimized for multi-application workloads to significantly increase the speed of IT operations and enable IT to respond to business needs of any size, faster.

The HPE ProLiant Gen10 rack portfolio delivers:

- Up to 61% performance increase and 27% increase in core with the new Intel® Xeon® Scalable processors[4]
- Up to 27X faster checkpoint operations enabling significantly faster business operations[5]
- 82% greater memory bandwidth increasing application performance for memory-intensive applications[6]
- 14% more processor cores for greater VM density and 33% greater memory capacity for better VM performance and price/performance using AMD EPYC™ processors[7]

[4] HPE measurements: Up to 61% performance increase of Intel Xeon Platinum vs. previous generation E5-4600 v4 average gains of STREAM, LINPACK, SPEC CPU2006 and SPEC CPU2017 metrics on HPE servers comparing 4-socket Intel Xeon Platinum 8280 to E5-4699 v4 family processors. Any difference in system hardware or software design or configuration may affect actual performance. April 2019.

Up to 27% performance increase of Intel Xeon Platinum vs. previous generation comparing 4-socket Intel Xeon Platinum 8280 (28 cores) to E5-4669 v4 (22 cores). Calculation 28 cores/22 cores= 1.27 = 27%. April 2019.

[5] TPC-C Benchmark Throughput with Checkpoint (trans/sec). Calculated Time to Checkpoint and Restore a Docker Container running MySQL, compare Persistent Memory vs. SSD, November 2018.

[6] Percentage compare Gen10 vs. Gen9: Gen10 = 12 Channels x 2933 data rate x 8 bytes = 281 GB/sec. Gen9 = 8 channels x 2400 x 8 bytes = 154 GB/Sec. 281/154 = 1.82 or Gen10 is 82% greater bandwidth. Any difference in system hardware or software design or configuration may affect actual performance. April 2019.

[7] AMD EPYC 7601 Processor as compared to the Intel Xeon Platinum 8176 Processor, October 2017.

Get more depth with the technical white paper:
Technologies in HPE ProLiant Gen10 2-socket servers
Technologies in HPE ProLiant Gen10 4-socket servers

- **Moor insights: Hybrid cloud helps businesses navigate through digital transformation**
- **Demystifying Server Root of Trust**
- **Moore insights: HPE locks down server security**

HPE Gen10 Technology portfolio

HPE ProLiant servers feature user-inspired innovations to make IT simpler,[8] including:

Agility

- HPE enhances performance by taking server tuning to the next level. Workload Performance Advisor adds real-time tuning recommendations driven by server resource usage analytics and builds upon existing tuning features such as workload matching and jitter smoothing
- The latest processor technologies including second-generation Intel Xeon Scalable processors and AMD EPYC 7000 Series processors
- Enhance server performance with HPE SmartMemory at 2933 MT/s speed and HPE Fast Fault Tolerance (for Intel processors only)
- Easily select, deploy, manage, and maintain HPE **server infrastructure** over the server lifecycle with HPE OneSphere, HPE InfoSight, HPE OneView, HPE iLO 5, and iLO Amplifier Pack

Security

- Protect from attacks with the HPE exclusive, HPE Silicon Root of Trust
- Detect compromised code or malware with Run-time Firmware Verification
- AMD Secure Processor technology enables Secure Memory Encryption (SME) and Secure Encrypted Virtualization (SEV) for added security
- Intel SGX protects selected code and data from disclosure or modification. By cryptographically isolating application data in runtime memory, Intel SGX provides granular data protection with a tight trust boundary. Intel SGX is supported on HPE ProLiant DL20 and ML30 Gen10 servers
- Recover firmware to last good known state or factory settings with Secure Recovery
- Protect from attacks with HPE enhanced security features including Server Configuration Lock, iLO Security Dashboard and One-Button Secure Erase
- Security hardware options including Trusted Platform Module (TPM), Chassis Intrusion Detection Kit, and Secure NICs

Economic control

- **HPE GreenLake Flex Capacity** provides the simplicity and flexibility of the public cloud with the security and control of your own environment
- IT investment solutions from HPE Financial Services help you unlock value from your existing IT to fund innovation making you a more agile business

Transition guide

The Gen10 family offers the right compute to meet all your diverse workload needs. As such, we're tailoring compute to offer more flexibility and choice, such as offerings from both Intel and AMD, HPE FlexibleLOM, HPE Smart Array, HPE SmartMemory, NVMe, HPE Persistent Memory,[9] HPE DC Persistent Memory featuring Intel® Optane™ Technology,[10] and many more options.

[8] For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**

[9] Supported on first generation Intel Xeon Scalable processors

[10] Supported on second generation Intel Xeon Scalable processors

HPE ProLiant sizer tools:
HPE server TCO calculator

Over the past several generations of the rack and tower portfolio we have adjusted the product offerings to best address the needs of our customers. The following table shows the transition previous generations of servers to Gen10:

Gen8 models	Gen9 models	Gen10 models
HP ProLiant MicroServer Gen8	N/A	HPE ProLiant MicroServer Gen10
HP ProLiant ML10 v2	HPE ProLiant ML10 Gen9	HPE ProLiant MicroServer Gen10 or HPE ProLiant ML30 Gen10
HP ProLiant ML310e Gen8 v2	HPE ProLiant ML30 Gen9	HPE ProLiant ML30 Gen10
HP ProLiant ML310e Gen8 v2	HPE ProLiant ML110 Gen9	HPE ProLiant ML110 Gen10
HP ProLiant ML350e Gen8	HPE ProLiant ML150 Gen9	HPE ProLiant ML110 Gen10 or HPE ProLiant ML350 Gen10
HP ProLiant ML350p Gen8	HPE ProLiant ML350 Gen9	HPE ProLiant ML350 Gen10
HP ProLiant DL320e Gen8 v2	HPE ProLiant DL20 Gen9	HPE ProLiant DL20 Gen10
N/A	N/A	HPE ProLiant DL325 Gen10
N/A	HPE ProLiant DL60 Gen9	HPE ProLiant DL360 Gen10
N/A	HPE ProLiant DL80 Gen9	HPE ProLiant DL380 Gen10
N/A	HPE ProLiant DL120 Gen9	HPE ProLiant DL360 Gen10
HP ProLiant DL360e Gen8	HPE ProLiant DL160 Gen9	HPE ProLiant DL360 Gen10
HP ProLiant DL380e Gen8	HPE ProLiant DL180 Gen9	HPE ProLiant DL380 Gen10
HP ProLiant DL360p Gen8	HPE ProLiant DL360 Gen9	HPE ProLiant DL360 Gen10
HP ProLiant DL380p Gen8	HPE ProLiant DL380 Gen9	HPE ProLiant DL380 Gen10
HP ProLiant DL385p Gen8	N/A	HPE ProLiant DL385 Gen10
HP ProLiant DL560 Gen8	HPE ProLiant DL560 Gen9	HPE ProLiant DL560 Gen10
HP ProLiant DL580 Gen8	HPE ProLiant DL580 Gen9	HPE ProLiant DL580 Gen10

For additional information on reference architectures including complete configurations, sizing, BOM, and deployment details, refer to **hpe.com/info/ra**

Choose your rack or tower server

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

- HPE ProLiant 10 series—Small Scale Servers—Easy to buy and deploy
- HPE ProLiant 100 series—Right-Sized Servers—Balance of performance, efficiency, capacity, and manageability
- HPE ProLiant 300 series—Versatile Performance Servers—Industry-leading design with flexible choices for multi-workload compute and storage
- HPE ProLiant 500 series—Scale-up Servers—Scalable performance for business-critical workloads

Small Scale Servers

Is this your first server? Consider these HPE ProLiant Essential servers.

	MicroServer Gen10	ML30 Gen9	ML30 Gen10
	The compact server to make your own	The ideal first server for growing businesses	The ideal small office 1P tower with enterprise-class features
Number of processors	1	1	1
Processors supported	AMD Opteron™ X3421 AMD Opteron X3418 AMD Opteron X3216	Intel Xeon E3-1200 v5/v6 series Intel® Core™ i3-6000/7000 series Intel Pentium® G4000 series	Intel Xeon E 2100 series Intel Core i3-8300 Intel Pentium G5400
Cores per processor	2/4	2/4	2/4/6
Maximum processor frequency/cache	3.4 GHz/2 MB	3.6 GHz/8 MB	3.8 GHz/8 MB or 3.7 GHz/12 MB
I/O expansion slots	2 PCIe 3.0, 1 x 8, 1 x 4	4 PCIe 3.0, 1 x 16, 1 x 8, 2 x 4, 3 FH/FL, 1 FH/HL	4 PCIe 3.0, 2 x16 FH/FL, 2 x8 FH/HL
Maximum memory/# slots/ speed	32 GB/2/2400 MT/s	64 GB/4/2133, 2400 MT/s	64 GB/4/2666 MT/s
Storage controller	Embedded Marvell SATA controller (HW RAID 0, 1, 10 Support)	B140i, optional Smart Array and Smart HBA via PCIe*	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*
Maximum storage drive bays	4 LFF SATA, non-hot plug Optional (1) Slim SATA ODD or (1) Slim SFF SATA SSD	8 SFF or 4 LFF HDD/SSD	8 SFF or 4 LFF HDD/SSD or 4 LFF NHP; 1 M.2 NVMe SSD slot; with optional 1 slim-line ODD
Maximum internal storage	16 TB	48 TB	61.44 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/N/A	2 x 1GbE/N/A	2 x 1GbE/N/A
VGA/serial/USB/SD ports	1/0/7/0 plus 2 display ports	1/0/10/1	1/1(optional)/7/0
GPU support	Optional AMD Radeon Pro WX 2100	Optional	Optional NVIDIA® P2000 or AMD WX 2100
Form factor/chassis depth	Ultra Micro Tower/10*	Micro ATX Tower (4U)/18.71*	Micro ATX Tower (4U)/18.71*
Power and cooling	200W ATX non-hot plug, non-redundant PS	350W ATX PS; 460W redundant PS	350W ATX PS or 500W 94% efficiency Flex Slot redundant PS
Industry compliance	N/A	N/A	ASHRAE A3 and A4
System ROM	UEFI	UEFI Legacy BIOS	UEFI Legacy BIOS
Management	N/A	HPE iLO 4, Intelligent Provisioning, Smart Update Manager Optional: HPE iLO Advanced	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager Optional: HPE InfoSight, HPE iLO Advanced
Serviceability—easy install rails	N/A	N/A	N/A
Warranty—(years) (parts/labor/on-site)	1/1/1	3/1/1 or 3/3/3 (depending on regions)	3/1/1 or 3/3/3 (depending on regions)

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

Small Scale Servers (continued)

	DL20 Gen9	DL20 Gen10
	Compact, versatile, and efficient	The most compact and versatile rack server
Number of processors	1	1
Processors supported	Intel Xeon E3-1200 v5/v6 series Intel Core i3 Intel Pentium	Intel Xeon E 2100 series Intel Core i3 Intel Pentium
Cores per processor	2/4	2/4/6
Maximum processor frequency/cache	3.9 GHz/8 MB	3.8 GHz/12 MB
I/O expansion slots	Up to 2 PCIe 3.0, 2 x 8, 2 FH/HL	2 PCIe 3.0 slots
Maximum memory/# slots/ speed	64 GB/4/2133 MT/s	64 GB/4/2666 MT/s
Storage controller	B140i, optional Smart Array P440 with FBWC, or H240 Smart HBA via PCIe*	Standard HPE Smart Array S100i Software RAID Choice of HPE Smart Array Essential and Performance RAID Controllers for performance or additional features
Maximum storage drive bays	4 SFF or 2 LFF HDD/SSD	Up to 4+2 SFF/2 LFF max, HDD/SSD, M.2 2280 NVMe SSDs (optional)
Maximum internal storage	20 TB	91.8 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/FlexibleLOM slot on riser (optional)	2 x 1GbE embedded + Choice of FlexibleLOM + Standup
VGA/serial/USB/SD ports	1/0/5/1	USB 3.0 Front (1), USB 2.0 iLO Service Port (1), Internal USB 3.0 (1), USB 3.0 Rear (2)
GPU support	Optional	N/A
Form factor/chassis depth	Rack (1U)/15.05" (ear to rear)	Rack (1U)/15.05" (ear to rear)
Power and cooling	Standard 290W (80 PLUS Silver certified) power supply; HPE 900W AC 240 VDC Redundant Power Supply Kit (80 PLUS Gold certified) (optional for SFF chassis only)	290W Standard NHP PSU with up to 92% efficiency (80 PLUS Silver certified). 500W Flexible Slot Hot plug Redundant PSU with 94% efficiency 800W Flexible slot 48 VDC Hot plug Redundant PSU with 94% efficiency
Industry compliance	ASHRAE A3, ENERGY STAR® (only on RPS configuration models)	ASHRAE A3/A4, ENERGY STAR configuration (only on DL20 SFF chassis with RPS)
System ROM	UEFI Legacy BIOS	UEFI Legacy BIOS
Management	HPE iLO 4, HPE OneView Standard, Intelligent Provisioning, HPE Systems Insight Manager (SIM), Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE iLO Advanced, HPE OneView Advanced	HPE OneView and HPE iLO Advanced, HPE Insight Online with enhanced mobile application, HPE iLO 5, SUM, RESTful Interface Tool, UEFI Optional: HPE InfoSight, HPE iLO Advanced, HPE OneView Advanced
Serviceability—easy install rails	N/A	N/A
Warranty—(years) (parts/labor/on-site)	1/1/1	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

Right-Sized Servers

Are your IT needs growing? Consider these HPE ProLiant 100 series servers.

	ML110 Gen10
	1P tower with enterprise-class reliability and performance
Number of processors	1
Processors supported	Intel Xeon Scalable processor 5100, 4100, and 3100 series
Cores per processor	4/6/8/14
Maximum processor frequency/cache	3.6 GHz/19.25 MB
I/O expansion slots	Up to 5 PCIe 3.0, 2 x 16, 3 x 8, 1 FH/FL, 3 FH/HL, 1 FH/¾L
Maximum memory/# slots/speed	192 GB/6/2666 MT/s
Storage controller	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*
Maximum storage drive bays	8 LFF, 16 SFF, or 8 NHP/HP LFF HDD/SSD
Maximum internal storage	96 TB
Networking ports (embedded)/FlexibleLOM	2 x 1GbE/NA
VGA/serial/USB/SD ports	1/1 (optional)/8/1
GPU support	Optional (2)
Form factor/chassis depth	Tower (4.5U)/< 19"
Power and cooling	Up to 94% efficiency. 800W RPS, ATX 350W/550W PSU Optional Redundant Fan Kit
Industry compliance	ASHRAE A3, ENERGY STAR
System ROM	UEFI Legacy BIOS
Management	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced
Serviceability—easy install rails	N/A
Warranty—(years) (parts/labor/on-site)	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

Versatile Performance Servers

Are you continuing to need traditional IT for diverse workloads? Consider these HPE ProLiant 300 series servers.

ML350 Gen10

DL360 Gen10

DL380 Gen10

	ML350 Gen10	DL360 Gen10	DL380 Gen10
	ProLiant's most powerful and versatile 2P tower	The dense compute standard for multi-workload environments	The industry-leading server for multi-workload compute
Number of processors	1 or 2	1 or 2	1 or 2
Processors supported	Intel Xeon Scalable processor 8100, 6100, 5100, 4100, 3100 series Intel Xeon Scalable processor 8200, 6200, 5200, 4200, 3200 series	Intel Xeon Scalable processor 8100, 6100, 5100, 4100, 3100 series Intel Xeon Scalable processor 8200, 6200, 5200, 4200, 3200 series	Intel Xeon Scalable processor 8100, 6100, 5100, 4100, and 3100 series Intel Xeon Scalable processor 8200, 6200, 5200, 4200, 3200 series
Cores per processor	4/6/8/10/12/14/16/18/20/22/24/26/28	4/6/8/10/12/14/16/18/20/22/24/26/28	4/6/8/10/12/14/16/18/20/22/24/26/28
Maximum processor frequency/cache	3.8 GHz/38.5 MB	3.8 GHz/38.5 MB	3.8 GHz/38.5 MB
I/O expansion slots	Up to 8 PCIe 3.0, 4 x 16, 4 x 8, 8 FH/FL	Up to 3 PCIe 3.0, 1 x 16, 1 x 8, 1 FH/¾L, 1 FH/HL length	Up to 8 PCIe 3.0
Maximum memory/# slots/ speed	3 TB/24/2933 MT/s	3 TB/24/2933 MT/s	3 TB/24/2933 MT/s
Maximum HPE DC Persistent Memory		Up to 12 DC Persistent Memory kits (6 TB max)	Up to 12 DC Persistent Memory kits (6 TB max)
Maximum HPE Persistent Memory	N/A	Up to (12) 16 GB NVDIMMs option (192 GB max)**	Up to (24) 16 GB NVDIMMs option (384 GB max)**
Storage controller	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*	S100i, optional HPE Smart Array Essential and Performance RAID Controllers Mode Controllers*	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*
Maximum storage drive bays	24 SFF or 12 LFF HDD/SSD or 8 NVMe or 12 LFF NHP, M.2 SATA/PCIe enabled	10 NVMe + 1 SFF or 8 + 2 + 1 SFF or 4 LFF + 1 SFF SAS/SATA HDD/SSD M.2 SATA/ PCIe enabled, optional Dual uFF M.2 Enablement Kits	24 + 6 SFF SAS/SATA HDD/SSD or 12 + 4 + 3 LFF + 2 SFF SAS/SATA HDD/SSD or 20 NVMe PCIe SSD, M.2 enabled, optional dual uFF enablement kits
Maximum internal storage	184.32 TB	168+ TB	462 TB
Networking ports (embedded)/ option	4 x 1GbE/standup card	4 x 1GbE/Optional FlexibleLOM/standup cards	4 x 1GbE/Optional FlexibleLOM/standup cards
VGA/serial/USB/SD ports	1/1/6/1	Display port (front) VGA (rear)/1 1 optional serial (rear)/5 USB 3.0 (1 front, 2 internal, 1 rear); 1 USB 2.0 Optional (front)/1 SD port (internal)	Display (UMB) VGA (optional)/1/5 (2 optional)/1
GPU support	Single-/double-wide active/passive up to 10.5" (4)	Single-wide and active to 9.5" (2), up to 150W each	Single-wide (5)/double-wide (3) and active/ passive up to 10.5 cards
Form factor/chassis depth	Tower (4U)/25.5" or Rack (5U)/25.5"	Rack (1U)/27.81" (SFF), 29.5" (LFF)	Rack (1U)/26.75" (SFF), 28.75" (LFF)
Power and cooling	Up to 2 Flex Slot, redundancy optional, 500W, 800W, or 1600W, up to 96% efficient or up to 1 500W non-RPS/NHP 92% efficient standard power supply	Up to 2 Flex Slot, redundancy optional, 500W, 800W, or 1600W; up to 96% efficient (Titanium); hot plug fans with full N+1 redundancy; optional high-performance fans	Up to 2 Flex Slot, redundancy optional, 500W, 800W, or 1600W; up to 96% efficient (Titanium); hot plug fans with full N+1 redundancy; optional high-performance fans
Industry compliance	ASHRAE A3 and A4, lower idle power, ENERGY STAR	ASHRAE A3 and A4, ENERGY STAR	ASHRAE A3 and A4, ENERGY STAR
System ROM	UEFI Legacy BIOS	UEFI Legacy BIOS	UEFI Legacy BIOS
Management	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced, HPE OneView Advanced	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced, HPE OneView Advanced, HPE OneSphere	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced; HPE OneView Advanced, HPE OneSphere
Serviceability—easy install rails	N/A	Standard	Standard
Warranty—(years) (parts/labor/on-site)	3/3/3	3/3/3	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

** Supported on first generation Intel Xeon Scalable processors

Versatile Performance Servers (continued)

	DL325 Gen10	DL385 Gen10
	The secure and versatile single socket server delivering 2P performance at 1P economics	A new formula for server virtualization
Number of processors	1	1 or 2
Processors supported	AMD EPYC 7000 Series Processor family	AMD EPYC 7000 Series Processor family
Cores per processor	8/16/24/32	8/16/24/32
Maximum processor frequency/cache	3.2 GHz/64 MB	3.2 GHz/64 MB
I/O expansion slots	Up to 3 PCIe 3.0	Up to 8 PCIe 3.0
Maximum memory/ # slots/speed	2 TB/16/2666 MT/s	4 TB/32/2666 MT/s
Maximum HPE Persistent Memory	N/A	N/A
Maximum HPE DC Persistent Memory	N/A	N/A
Storage controller	S100i (Available in 1H 2019), optional HPE Smart Array Essential and Performance RAID Controllers*	S100i for M.2 support, optional HPE Smart Array Essential and Performance RAID Controllers*
Maximum storage drive bays	8 + 2 SFF/4 LFF HDD/SSD, up to 10 SFF NVMe	24 + 6 SFF SAS/SATA HDD/SSD or 12 + 4 + 3 LFF + 2 SFF SAS/SATA HDD/SSD or 24 NVMe PCI and 2 M.2 connectors embedded on mother board SSD, optional dual uFF enablement kits
Maximum internal storage	153 TB	462 TB
Networking ports (embedded)/option	4 x 1GbE/Optional FlexibleLOM/standup cards	4 x 1GbE/Optional FlexibleLOM/standup cards
VGA/serial/USB/SD ports	1 VGA/1 serial (optional)/4/1	Display (UMB) VGA (optional)/1/5 (2 optional)/1
GPU support	N/A	Single-wide (5)/double-wide (3) and active/passive up to 10.5 cards
Form factor/chassis depth	Rack (1U)/24.2"	Rack (1U)/26.75" (SFF), 28.75" (LFF)
Power and cooling	Up to 2 Flex Slot, redundancy optional, 500W, 800W, or 1600W; up to 96% efficient (Titanium) w/ Flexible Slot PS or up to 1500W non-RPS/NHP 92% efficient standard power supply; hot-swappable fans with full N+1 redundancy	Up to 2 Flex Slot, redundancy optional, 500W, 800W, or 1600W; up to 96% efficient (Titanium); hot plug fans with full N+1 redundancy; optional high-performance fans
Industry compliance	ASHRAE A3 and A4, ENERGY STAR	ASHRAE A3 and A4, ENERGY STAR
System ROM	UEFI Legacy BIOS	UEFI Legacy BIOS
Management	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight HPE iLO Advanced, HPE OneView Advanced HPE OneSphere	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight HPE iLO Advanced, HPE OneView Advanced HPE OneSphere
Serviceability—easy install rails	Standard	Standard
Warranty—(years) (parts/labor/on-site)	3/3/3	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

Scale-up Servers

Do you need to scale up? Consider these HPE ProLiant 500 series servers.

	DL560 Gen10	**DL580 Gen10**
	The high-density scale-up server for business-critical workloads	The resilient, highly expandable scale-up server for business critical workloads
Number of processors	1, 2, or 4	1, 2, 3, or 4
Processors supported	Intel Xeon Scalable processor 8100, 6100, and 5100 series Intel Xeon Scalable processor 8200, 6200, and 5200 series	Intel Xeon Scalable processor 8100, 6100, and 5100 series Intel Xeon Scalable processor 8200, 6200, and 5200 series
Cores per processor	4/6/8/10/12/14/16/18/20/22/24/26/28	4/6/8/10/12/14/16/18/20/22/24/26/28
Maximum processor frequency/cache	3.8 GHz/38.5 MB	3.8 GHz/38.5 MB
I/O expansion slots	Up to 8 PCIe 3.0	Up to 16 PCIe 3.0
Maximum memory/ # slots/speed	6 TB/48/2933 MT/s*	6 TB/48/2933 MT/s
Maximum HPE Persistent Memory	Up to (24) 16 GB NVDIMMs option (384 GB max)**	Up to (24) 16 GB NVDIMMs option (384 GB max)**
Maximum HPE DC Persistent Memory	Up to 24 DC Persistent Memory kits (12 TB max)	Up to 24 DC Persistent Memory kits (12 TB max)
Storage controller (embedded)	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*	S100i, optional HPE Smart Array Essential and Performance RAID Controllers*
Maximum storage drive bays	24 SFF SAS/SATA HDD/SSD with Optional 12 NVMe SSD, M.2 enabled Optional: Dual uFF enablement kits	48 SFF SAS/SATA HDD/SSD Optional: 20 NVMe SSD
Maximum internal storage	367 TB	734 TB
Networking ports (embedded)/options	Optional FlexibleLOM/standup cards	Optional FlexibleLOM/standup cards
VGA/serial/USB/SD ports	2/1/9/1	2/1/9/2
GPU support	HL/FH (2)	FL/FH Double-wide (4)
Form factor/chassis depth	Rack (2U)/29.75" (SFF)	Rack (4U)/29.75"
Power and cooling	Up to 4 Flex Slot, redundancy optional, 800W or 1600W; hot plug fans with full N+1 redundancy	Up to 4 Flex Slot, 94% efficient 800W or 1600W; hot plug fans with N+1 redundancy
Industry compliance	ASHRAE A3 and A4, ENERGY STAR	ASHRAE A3 and A4, ENERGY STAR
System ROM	UEFI Legacy BIOS	UEFI Legacy BIOS
Management	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced, HPE OneView Advanced, HPE OneSphere	HPE iLO 5, HPE OneView Standard, Intelligent Provisioning, Smart Update Manager, RESTful Interface Tool, HPE iLO Amplifier Pack Optional: HPE InfoSight, HPE iLO Advanced, HPE OneView Advanced, HPE OneSphere
Serviceability—easy install rails	Standard	Standard with CMA
Warranty—(years) (parts/labor/on-site)	3/3/3	3/3/3

* For a full list of supported options and details, see the server QuickSpecs at **hpe.com/info/qs**.

** Supported on first generation Intel Xeon Scalable processors

Which operating systems/virtual environments are supported?

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

- Microsoft®
- Red Hat®
- SUSE
- Oracle
- Canonical
- ClearOS (supported on 10, 100, and 300 series servers)

You can purchase your entire operating environment from Hewlett Packard Enterprise; 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.

ClearOS is a simple, secure, and affordable operating system with an application marketplace of over 100 applications that allows customers to lean on their trusted IT partner to build customized solutions. ClearOS is available via CTO, Intelligent Provisioning, or via download. To learn more on what you can do, please visit **hpe.com/servers/clearos**.

For the latest operating system support information and to learn more, see: **hpe.com/info/ossupport**.

Get enhanced functionality and added benefits with HPE Server Options

Inside each HPE server are essential performance building blocks—think core DNA—such as DDR4 memory, storage, and network adapters. We call these building blocks **HPE Server Options**—designed to deliver the highest performance for any workload, deliver that performance with persistent reliability, and at economics that don't slow down your business. Thus, **ProLiant Gen10 servers** configured with HPE Server Options are the ideal solution for any application workload and any IT environment, from the smallest SMB site to the largest enterprise data center.

HPE Server Options are integrated with many HPE system management tools for easy configuration, maintenance, and installation, lowering your operations costs when compared to non-HPE components.

HPE Server Options have gone through a rigorous testing process for flawless installation, maintenance, and upgrade. There's a wide range of options, from storage drives, memory, network adapters, and processors, to the Rack and Power Infrastructure and beyond.

HPE Server Memory

Choosing the right memory is the key to getting the highest application performance, system reliability, and faster return on your IT investment. HPE's portfolio includes HPE Standard Memory—suitable for smaller capacity needs—and HPE SmartMemory, for memory-intensive workloads. Customers may select from different HPE memory types and DIMM capacities to optimize server efficiency, capacity, and performance.

All HPE memory modules are tested on ProLiant server platforms beyond industry standards to diagnose problems, deliver rapid resolutions, and avoid failures. Additional authentication assures you that your memory is optimized and performance tuned for your server. For more information, visit **hpe.com/info/memory**.

HPE Server Storage

As data storage and accessibility requirements grow, you need solutions that can help overcome performance bottlenecks. HPE Server Storage for ProLiant Gen10 servers offer the industry's broadest portfolio of storage products, which include hard disk drives (HDDs), solid-state drives (SSDs), and Smart Array Controllers.

HPE Smart Array Gen10: HPE's new line of enterprise-class RAID controllers for Gen10 servers help maximize performance, data availability, and storage capacity. They deliver up to 1.6 million IOPS—65% better performance[11]—while using up to 45% less power[12] than previous generation controllers. And new mixed mode offers customers the flexibility of using both HBA and RAID mode, simultaneously, on a single controller freeing up a PCIe slot for other uses. Choose from Smart Array S-Class software RAID, and Smart Array E-Class or P-Class controllers.

- Ideal for entry-level solutions that use SATA drives in basic RAID configurations, **HPE Smart Array S-Class (Software RAID)** delivers the efficiency needed to address evolving data storage needs. Features include RAID levels 0/1/5, support for 6G SATA, and access to the Unified Extensible Firmware Interface (UEFI) configuration tool.
- Cost-effective **HPE Smart Array E-Class Controllers** provide simple RAID storage and enablement for software-defined storage with enterprise-class reliability and security. Key features include RAID on Chip (ROC) and RAID levels 0/1/5/10. This controller operates in mixed mode, encrypts any drive connected to it with HPE Smart Array SR Secure Encryption, and provides simplicity with the UEFI configuration tool.

[11] Internal lab testing performed January 2017 comparing HPE Gen9 to Gen10 Smart Array Controllers with 4 KB random read test.

[12] Internal lab testing performed October 2016 comparing HPE Gen9 vs. Gen10 Smart Array Controllers.

- Maximize the performance of enterprise-class server storage with **HPE Smart Array P-Class Controllers**. These controllers are supported on HPE ProLiant rack and tower, BladeSystem, and Apollo servers, and Synergy Compute Modules. Key features include RAID on Chip (ROC), support for flash-backed write cache (FBWC), and advanced RAID levels 0/1/5/6/10/50/60 ADM. This controller operates in mixed mode, encrypts any drive connected to it with HPE Smart Array SR Secure Encryption, and provides simplicity with the UEFI configuration tool.

HPE hard disk drives (HDDs) deliver proven performance for any workload with reliable data integrity and security at the lowest cost per gigabyte. Available for three types of workloads: enterprise (performance optimized), midline (capacity optimized), and entry. With two interfaces: SAS (12G) and SATA (6G); two form factors: SFF (2.5") and LFF (3.5").

- **Enterprise HDDs** (SAS 15K and 10K) deliver the highest levels of performance and reliability for your mission-critical and I/O-intensive applications.
- **Midline HDDs** (SAS/SATA 7.2K) deliver high capacity, performance, and reliability for your business-critical applications.
- **Entry HDDs** are built for non-critical needs for today's server applications and storage environments. These high-capacity drives provide the lowest $/GB.

Accelerate the performance of your data-intensive applications with HPE solid-state drives (SSDs) offering high performance and low latency for enterprise environments. HPE SSDs come in six form factors: SFF (2.5"), LFF (3.5"), M.2, M.2 Enablement Kits, Mezzanine and Add-in Cards. They are available in three broad categories based on target workloads: Read Intensive, Mixed Use, and Write Intensive.

The workloads indicate the number of drive writes per day (DWPD) that you can expect from the drive.[13]

- Read Intensive SSDs are typically the lowest price with endurance of <= 1 DWPD. Ideal for boot/swap, web servers, and read caching.
- Write Intensive SSDs typically have the highest write performance, with a typical endurance of >= 10 DWPD. Ideal for online transaction processing (OLTP), business intelligence, and Big Data analytics.
- Mixed Use SSDs are for workloads that need a balance of strong read and write performance, with Endurance typically > 1 and < 10 DWPD. Ideal for high I/O applications with workloads balanced between read and write.

All HPE server drives feature HPE digitally signed firmware, which prevents unauthorized access to your data by providing the assurance that the drive firmware comes from a trusted source and has not been altered. Each drive is also backed by 3.35 million hours of the industry's most rigorous testing and qualification program.[14] For more information, visit **hpe.com/info/serverstorage**.

HPE Persistent Memory

HPE Persistent Memory products will transform IT infrastructures, providing new levels of performance while delivering high levels of reliability and efficiency.

HPE Persistent Memory approaches the speed of traditional DRAM and adds the persistence of storage, ensuring ongoing data safety even in the event of an interruption in power due to an unexpected power loss, system crash, or normal system shutdown. The combination of affordable capacity and non-volatility will help you extract greater value from data-intensive applications.

HPE's Persistent Memory products based on 16 GB NVDIMMs, are flash-backed DIMMs, and are supported on the first generation of Intel Xeon Scalable processors. HPE NVDIMMs are designed to eliminate smaller storage bottlenecks while delivering DRAM-level performance. This means customers can access, analyze, and act on data more quickly to gain competitive advantages.

[13] The workloads indicate the number of drive writes per day (DWPD) that you can expect from the drive. DWPD is the maximum number of 4K host writes to the entire drive capacity of the SSD per day over a five-year period.

[14] HPE internal lab testing. 3.35M hour test quant is derived from a combination of drive qualification test plans, specifically HDDQ spec-supplier responsibility to perform, HDDQ spec-HPE responsibility to perform, Reliability Demonstration Test (RDT) spec, CSI integration test spec and pilot test requirements. May 2017.

Resources
HPE Server Options home page

HPE Rack and Power Infrastructure home page

HPE DC Persistent Memory delivers performance and capacity for data-intensive workloads, is based on Intel Optane DC Persistent Memory and is supported on the second generation of Intel Xeon Scalable processors. HPE DC Persistent Memory is the next step in the evolution of persistent memory and provides fast, high capacity, cost-effective memory and storage and will transform Big Data workloads and analytics possibilities in the data center by enabling data to be stored, moved, and processed at unprecedented speed.

HPE Persistent Memory helps customers keep pace with today's business demands by delivering the performance of memory with the persistence of storage. For more information, visit **hpe.com/info/persistentmemory**.

HPE Server Network Adapters
Cost-effective, dependable server networking products keep your IT running reliably and at peak performance. From switches to network adapters to transceivers and cables to the latest 50 Gb Ethernet technology, HPE Server Networking adapters are designed, developed, and tested to deliver state-of-the-art, secure performance.

These adapters help prevent, detect, and recover from cyberattacks by protecting applications, data and server infrastructure through authentication of digitally signed firmware via a Root of Trust architecture. In addition, they offer secure boot, device-level Firewall, and other advanced security features. For more information, visit **hpe.com/info/networking**.

For complete information on the HPE Server Management portfolio, refer to the webpage at **hpe.com/info/servermanagement**.

HPE Accelerators
Workloads can never finish their tasks too quickly. HPE offers a variety of accelerators to help customers accelerate the completion of their workloads. For increased computational and graphics requirements, HPE offers GPU accelerators from both NVIDIA and AMD. GPUs can be used for graphics acceleration, virtualization, as well as High Performance Computing and AI. HPE also offers Field Programmable Gate Array (FPGA) accelerators which are programmable multi-function accelerators which can be tailored to fit specific workloads. For more information, visit **hpe.com/servers/accelerators**.

HPE Rack and Power Infrastructure
Your data center is required to provide the foundational agility and compute power to support your business and enable your customers. But it can't be overlooked that your data center also has the same needs—infrastructure, agility, and compute power—to perform effectively. HPE Rack and Power Infrastructure provides configurable, state-of-the-art infrastructure solutions out of the box that can meet the needs of businesses of all sizes, now and in the future. HPE Rack and Power Infrastructure offerings deliver server rack, power, and cooling solutions that give you the maximum level of efficiency and integration for data centers of all sizes. For more information, visit **hpe.com/info/rackandpower**.

HPE Support for ASHRAE guidelines
Data center cooling systems represent a significant portion of your capital expenditure (CAPEX) and use a substantial amount of energy.

Hewlett Packard Enterprise supports the adoption of less expensive and eco-friendly cooling methods encouraged by the latest American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) guidelines for temperature and humidity operating ranges of IT equipment.

Most HPE Gen10 server products support the 2014 ASHRAE class A3 guidelines or higher.

For specific server details, visit **hpe.com/servers/ashrae**.

For additional details on supported options, refer to the server QuickSpecs at **hpe.com/info/qs**.

HPE Power Supplies
HPE Power Supplies offer high-efficiency operation and multiple input and output options, allowing users to right size a power supply for specific server/storage configurations and environments. This flexibility helps to minimize power waste, lower overall energy costs, and avoid trapped power capacity in the data center.

HPE server and infrastructure management software

For better insight and control
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 your 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.

To address these gaps, a new management methodology is required—one that drives better system control and greater insight into problems before they occur. And Hewlett Packard Enterprise has it.

HPE infrastructure management is delivered through a complete portfolio of HPE ProLiant lifecycle management capabilities that can flexibly operate from embedded management and system utilities, converged management for software-defined data centers, and support management. Managing HPE ProLiant servers with HPE 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, HPE infrastructure management encompasses critical areas such as server deployment and configuration, health and alerting, energy, power, remote management, and warranty and contract information access via a cloud-based portal. The core components that comprise HPE infrastructure management are Embedded Management, Integrated Lights-Out (iLO), and HPE OneView. With HPE infrastructure management's built-in automation, HPE ProLiant servers are so intelligent that they practically manage themselves.

In addition, scripting tools such as the Scripting Tool Kit (STK) as well as Service Pack for ProLiant and Smart Update Manager provide breakthrough system maintenance tools that systematically update HPE ProLiant rack and tower servers with one-click simplicity at the scale of your data center.

HPE OneView infrastructure management
HPE OneView is your infrastructure automation engine to simplify operations, increasing the speed of IT delivery for new applications and services. Through software-defined intelligence, HPE OneView brings a new level of automation to infrastructure management by taking a template driven approach to provisioning, updating, and integrating compute, storage, and networking infrastructure. Designed with a modern, standard-based API and supported by a large and growing partner ecosystem, HPE OneView also makes it easy to integrate powerful infrastructure automation into existing IT tools and processes.

Take command with HPE OneView to:

- **Deploy infrastructure faster:** Software-defined, template-based automation, rapidly and reliably provisions resources within minutes, reducing the risk of human error.
- **Simplify lifecycle operations:** A single interface ensures visibility across your entire data center and enables you to securely define and maintain firmware baselines and system configurations with consistent availability and control.
- **Increase productivity:** The unified API lets you accelerate application and service delivery and better enable developers, IT admins, and ISVs to automate infrastructure with a single line of code. The open API also allows easier integration with a growing ecosystem of partner tools and services.

HPE OneView innovations provide you the industry's best infrastructure management experience, simplifying operations for HPE BladeSystem, HPE ProLiant servers, HPE Apollo servers and HPE Superdome X systems, **HPE 3PAR StoreServ Storage**, **HPE StoreVirtual VSA iSCSI storage**, **HPE Networking**, and **HPE ConvergedSystem**. It is an essential ingredient in the HPE Hyper Converged 380 virtual machine vending environment and powers management for the industry's first composable infrastructure, **HPE Synergy**. By deploying HPE OneView today, you place your IT operations firmly on the path toward a composable future.

Please note that the HPE OneView license includes the right to use **HPE Insight Control** until you complete your transition.

HPE InfoSight artificial intelligence for hybrid cloud
With **HPE InfoSight** for Servers, combines the cloud-based machine learning of HPE InfoSight with the health and performance monitoring of Active Health System (AHS) and iLO to optimize performance and predict and prevent problems. The end result is an intelligent environment that modernizes IT operations and enhances the support experience by predicting and preventing the infrastructure issues that lead to application disruptions, wasted IT staff time, and missed business opportunities.

HPE InfoSight for server is the extension of HPE InfoSight for your ProLiant Gen10, Gen9, and Gen8 servers with iLO 5 and iLO 4. HPE InfoSight for Servers will be a multi-step journey that starts with a basic integration with HPE InfoSight that will become more extensive over time. The initial release of HPE InfoSight for Servers will include:

Predictive analytics to predict and prevent problems

- Data analytics for server security
- Predictive data analytics for parts failure

Global learning that provides wellness and performance dashboards for your global inventory of servers

- Global inventory of servers
- Performance, capacity, and utilization graphs

A recommendation engine to eliminate performance bottlenecks on servers

HPE iLO 5 server management
HPE Integrated Lights Out (iLO) allows you to configure, monitor, and update your HPE servers seamlessly from anywhere in the world. Providing you with consistent insight into the health and operation of your servers, HPE iLO arms you with the tools to resolve issues and keep your business running. Featuring the latest innovations in simplified operations, performance, and security, HPE iLO allows you to manage your entire server environment with ease.

Upgrade your licenses for additional functionality, such as graphical remote console, multi-user collaboration, video record/playback, and much more. Use the **HPE iLO Licensing Guide** to determine which of our three licensing upgrade options is right for you.

iLO Advanced
Ideal for the enterprise environment, this license provides advanced remote functionality and all the HPE iLO features to improve speed, scale, and simplicity. Key features include Integrated Remote Console, Virtual Media, and iLO Federation (rapid discovery, inventory, and management at scale).

Learn more at **hpe.com/servers/iloadvanced**.

In addition to embedded offerings like iLO, other products and tools, such as System Utilities, **Intelligent Provisioning**, **Smart Update Manager** (SUM), **Service Pack for ProLiant** (SPP), **iLO Amplifier Pack**, **Active Health System Viewer** and scripting tools such as **RESTful Interface Tool**, **Scripting Toolkit for Windows and Linux**, and **Scripting Tools for Windows PowerShell**, are available to all HPE ProLiant server customers.

Optimize performance with Embedded Performance Management
Through a partnership with Intel, HPE offers innovative server tuning technologies that enable you to dynamically configure server resources to match specific workloads. HPE server tuning features produce significant performance improvements, real savings, and a more intelligent server environment.

Jitter smoothing
Engaging processor turbo boost can cause frequency fluctuations or "jitter" which results in a constant struggle between maximum output and deterministic performance needs. HPE's jitter smoothing technology mitigates processor frequency fluctuation to reduce latency and deliver deterministic and reliable performance. In variable workloads where processor frequency changes occur often, jitter smoothing can improve overall throughput above turbo boost mode alone.[15]

Jitter smoothing is ideal for high frequency traders, high performance computing, and workloads where processor frequency is highly variable.

Available on all Gen10 Intel based servers with iLO 5 and an iLO Advanced or above license.

Workload matching
Automatically match internal server resources to the specific requirements of your workload. Workload matching offers preconfigured workload profiles that tune your server's BIOS settings for optimal performance and can save hours of server tuning time.

Available on all ProLiant Gen10 AMD and Intel based servers with iLO 5.

Workload Performance Advisor
Workload performance advisor complements workload matching, providing real-time feedback enabling you to monitor system performance and customize tuning settings based on actual workload behavior.

Maximize Security with AMD EPYC
The AMD EPYC processor provides several security related features, including AMD secure processor, Secure Memory Encryption (SME), and Secure Encrypted Virtualization (SEV). The AMD secure processor technology ties with and compliments, the HPE Silicon Root of Trust at the UEFI or BIOS level as an added validation of the BIOS during the boot process. The AMD secure processor validates the BIOS, upon boot-up, that there are no firmware anomalies or compromised code present. After this confirmation, the server boot process is allowed to continue. The AMD Secure Memory Encryption provides encryption on data stored in the server memory. The AMD secure encrypted virtualization creates security between virtual machines on the HPE ProLiant server, when supported by operating system and hypervisor software.

Available on all ProLiant Gen10 AMD based servers with iLO 5.

[15] HPE internal testing from the Performance Engineering Benchmarking team, April 2017.

HPE storage solutions for HPE ProLiant servers

No matter what your storage needs, HPE offers virtualized shared storage, data protection, and data retention and archiving solutions that complement your HPE ProLiant investment and are designed to offer a seamless service, support, and management experience. With storage solutions for any scale, performance, or investment level, you can handle more workloads more simply and more affordably by combining servers and storage solutions from HPE.

HPE disk enclosures
Manage growing storage needs with modular solutions for ProLiant capacity expansion. HPE disk enclosures let you expand your ProLiant server storage capacity at a low cost for a variety of general use cases. For more information, visit **hpe.com/storage/disk-enclosures**.

Entry-level shared storage
When performance and scale are your priorities, HPE also offers low-cost external storage systems that deliver the benefits of virtualized, shared storage and file sharing capably designed with ProLiant server users in mind. Our flexible entry storage options let you choose from direct attached storage to extend your server capabilities, NAS appliances for file sharing and home directory consolidation, and highly scalable shared storage arrays for physical and virtual applications that can run on your existing IP network or a dedicated Fibre Channel SAN. For more information, visit **hpe.com/storage/entry**.

All-flash and hybrid flash storage
The world is changing, fast. An all-flash data center is now a reality thanks to HPE Nimble Storage—with a choice between all flash and adaptive flash arrays—and the HPE 3PAR StoreServ family of all-flash and flash-optimized arrays. These lightning fast arrays deliver 99.9999% uptime with built-in resiliency. In addition, HPE Nimble Storage offers radical simplicity of management and a transformative support experience through HPE InfoSight predictive analytics. For more information, visit **hpe.com/storage/flash**.

Data availability, protection, and retention
Today's businesses demand aggressive service levels. Data loss, risk, and downtime must be avoided at all costs. When an outage does occur, recovery time must be minimized. HPE can equip you meet the most stringent Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs), all while reducing your protection storage capacity requirements. Learn more about our affordable portfolio of modern data availability, protection, and retention solutions with the right scale, performance, and application integration to meet your needs. For more information, visit **hpe.com/storage**.

Storage management and orchestration
With Hewlett Packard Enterprise, you can get past hardware management limitations with open, automated orchestration. Control storage, compute, and networking resources as well as data services across physical and Virtual Domains. It's all compatible with many third-party tools and fully integrated into HPE data storage solutions—from flash-optimized to software-defined. For more information, visit **hpe.com/storage/management**.

Storage networking
Hewlett Packard Enterprise provides dynamic end-to-end solutions, solving your storage networking challenges with nearly 15 million storage area network (SAN) fabric ports deployed worldwide. Agile **HPE StoreFabric** host adapters, multi-protocol switches, and highly scalable directors for cloud-optimized SANs ensure reliability and high performance. For more information, visit **hpe.com/storage/san**.

HPE Financial Services
Our IT investment solutions can help you modernize and expand your servers with better economic control, control that will help you extend your capacity to fund IT for business transformation. We can help you increase financial agility to scale and manage change. Access the best IT more affordably when you need it.

Select the program that fits your goals

- **Transition from old legacy IT to new hybrid cloud:** Shift existing owned assets to a flexible usage payment model. Receive the value hidden in your existing IT equipment to invest in new technology innovation.
- **Increase deployment flexibility:** Acquire forecasted compute and storage capacity in advance of the actual need, begin monthly payments as you deploy and install it over 12 months.
- **Manage experimental deployments:** Lower risks and improve control with built-in flexibility to return equipment without penalty within a set time window.
- **Routinely refresh your servers:** Regularly update your IT infrastructure more affordably every 24–48 months for predictable monthly or quarterly payments.
- **Simplify IT consumption for small and mid-sized businesses:** Subscribe to a complete, customized solution for a predictable monthly subscription fee and eliminate the hassle of ownership. Trade in your old IT to make room for a new subscription.

Optimize your IT investment strategy with new ways to acquire, pay for, and use technology, in lock-step with your business and transformation goals.
hpe.com/solutions/hpefinancialservices

Integration services

HPE 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. For more information, visit **hpe.com/info/factoryexpress**.

Technical training courses

HPE Education Services focuses on your most important asset, your people, to help prepare them to have the right skills to deliver business outcomes. HPE is a market leader in technology training, as recognized by IDC for five years running. With over 35 years of experience we lead the industry when it comes to modern skills-based IT training and digital on-demand learning. We deliver unmatched expertise across a broad range of HPE products, industry-leading technologies, and IT process disciplines by combining technical knowledge, business insight, and hands-on experience. **hpe.com/ww/training**

HPE Pointnext

HPE Pointnext leverages our strength in infrastructure, partner ecosystems and the end-to-end lifecycle experience, to accelerate powerful, scalable IT solutions to provide you the assistance for faster time to value. HPE Pointnext provides a comprehensive portfolio including Advisory and Transformational, Professional, and Operational Services to help accelerate your digital transformation.

Operational Services

- **HPE GreenLake Flex Capacity:** An infrastructure service that offers on-demand capacity, combining the agility and economics of public cloud with the security and performance of on-premises IT.
- **Datacenter Care:** HPE's most comprehensive support solution tailored to meet your specific data center support requirements. It offers a wide choice of proactive and reactive service levels to cover requirements ranging from the most basic to the most business-critical environments. **HPE Datacenter Care** Service is designed to scale to any size and type of data center environment while providing a single point of contact for all your support needs for HPE as well as selected multivendor products.
- **Proactive Care:** An integrated set of reactive and proactive services designed to help you improve the stability and operation of your device.
- **Foundation Care:** Support for HPE servers, storage, networking hardware and software to meet your availability requirements with a variety of coverage levels and response times.

Advisory and Transformation Services—HPE Pointnext designs the transformation and builds a road map tuned to your unique challenges including hybrid cloud, Workload and Application Migration, Big Data, and the edge. HPE leverages proven architectures and blueprints, integrates HPE Enterprise Group and partner products and solutions, and engages HPE Pointnext Professional and Operational Services teams as needed.

Professional Services—**HPE Pointnext** creates and integrates configurations that get the most out of software and hardware, and works with your preferred technologies to deliver the optimal solution. Services provided by the HPE Pointnext team, certified channel partners, or specialist delivery partners include installation and deployment services, mission-critical and technical services, and education services. For more information, visit **hpe.com/info/pointnext**.

HPE server families

A server for every need
Hewlett Packard Enterprise 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, designed for a wide variety of business needs. Explore our other server portfolios:

- **HPE BladeSystem family**—Simplify your data center with modular infrastructure platform.
- **HPE Hyperconverged**—Smaller, faster systems with integrated storage, networking, compute, and virtualization.
- **HPE ConvergedSystem**—Optimized for Big Data, client virtualization, cloud, and density optimized workloads.
- **HPE Moonshot System family**—Software-defined servers designed for specific workloads.
- **HPE Apollo System family**—Purpose-built platforms delivering extreme performance, scale, and efficiency for your AI and HPC workloads.
- **HPE Edgeline IoT Systems**—Edge computing that delivers secure control and accelerate time to insight from the Industrial Internet of Things.
- **HPE Cloudline Server**—Open systems that keep service providers ahead of growth, ensure adaptability, and reduce costs while complying with Open Compute Project standards.
- **HPE Synergy**—A new category of infrastructure that accelerates application delivery in both traditional and new IT environments.
- **HPE Integrity server family**—High-speed, resilient, mission-critical servers that exceed the demands of today's always-on world.

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