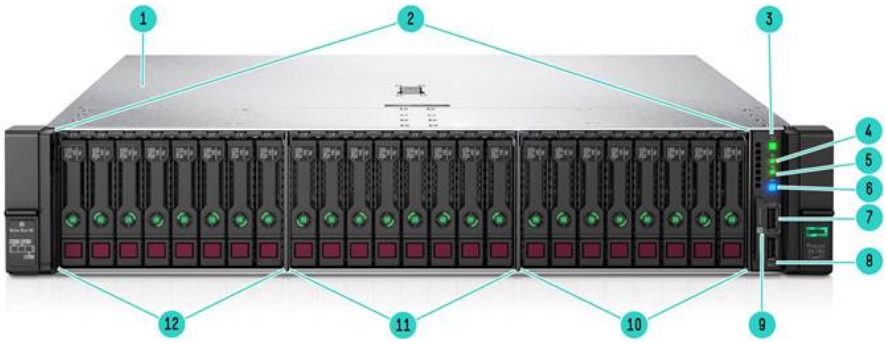
Overview

HPE ProLiant DX560 Gen10 Server

The HPE ProLiant DX560 Gen10 Server along with Nutanix provide a global partnership to deliver hyper-converged solutions in an on premise appliance or through the HPE Greenlake consumption model.. This offering will leverage Nutanix's free AHV hypervisor and Nutanix Enterprise Cloud software to provide customers with a pre-integrated and optimized solution that dramatically lowers total cost of ownership and accelerates operational productivity.

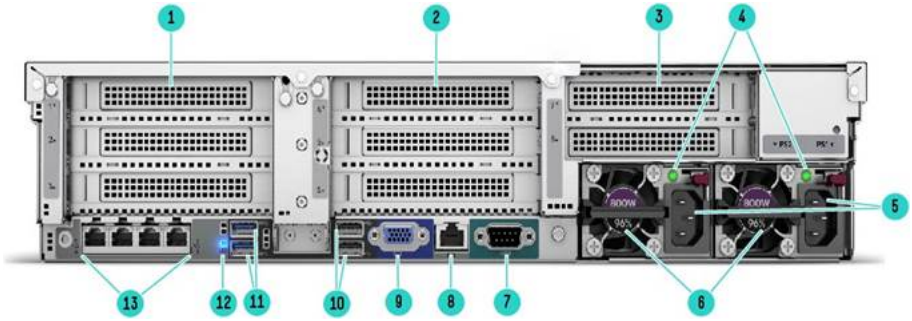
The HPE ProLiant DX560 Gen10 Server is a high-density, four-socket (4S) server with high performance, scalability and reliability, all in a 2U chassis. Supporting the latest 2nd generation Intel® Xeon® Scalable processors, the HPE ProLiant DX560 Gen10 Server offers greater processing power, up to 6 TB of faster memory, IO of up to eight PCIe 3.0 slots, up to 12 TB of HPE Persistent Memory plus the intelligence and simplicity of automated management with HPE OneView and HPE iLO 5.

The HPE ProLiant DX560 Gen10 Server is the ideal server for business critical workloads, virtualization, server consolidation, database, business processing, and general 4P data-intensive applications where data center space and the right performance are paramount.



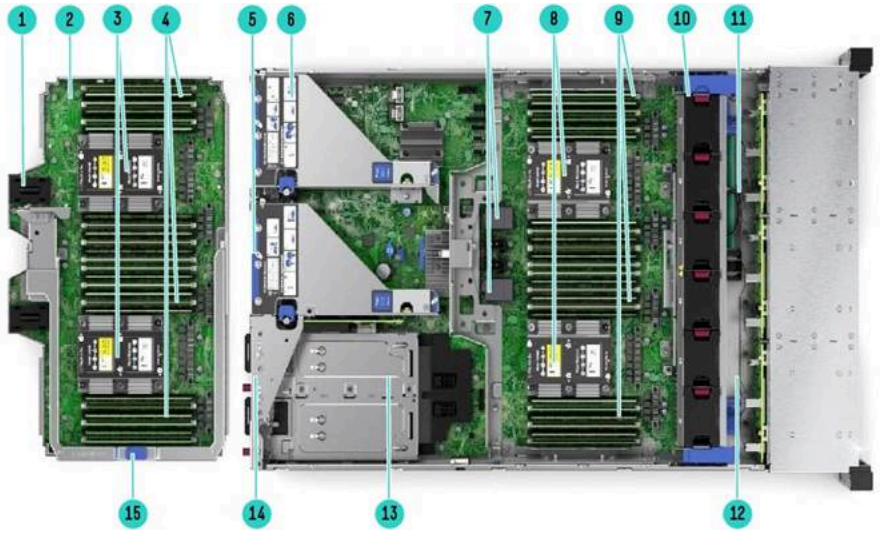
HPE ProLiant DX560 24SFF Gen10 Server - Front View

1. Quick removal access panel
2. Standard 24SFF SATA/SAS drive bays in 3 - 8 drive cage boxes
3. Power On/Standby button and system power LED button
4. Health LED
5. NIC status
6. UID button
7. iLO Front Service Port
8. USB 3.0
9. Serial label pull tag
10. Drive Box 3
11. Drive Box 2.
12. Drive Box 1



Rear View - HPE ProLiant DX560 Gen10 Server

1. PCIe Slots (Slots 1-3 top to bottom, riser shipped standard)
2. PCIe Slots (Slots 4-6 top to bottom, requires second riser card and second processor)
3. PCIe Slots (Slots 7-8 top to bottom), requires tertiary riser card and second processor, Not available with 4x Flex Slot power supplies
4. Power supply power LEDs
5. Power supply power connections
6. HPE Flexible Slot Power Supply bay 1 and 2 (800W PS shown)
7. Serial connector
8. Dedicated iLO connector
9. VGA (video) connector
10. USB connectors 2.0 (2)
11. USB connectors 3.0 (2)
12 Unit ID LED
13. FlexibleLOM ports (Port 1 on right side)



Internal View: HPE ProLiant DX560 Gen10 Server with upper CPU mezzanine tray

1. Left connector used for DX560 4-port NVMe Mezzanine card (Daughter card)
2. Upper CPU Mezzanine Board Kit
3. 2 Processors, heatsink showing on upper CPU mezzanine board kit
4. DDR4 DIMM slots on upper CPU mezzanine board kit. Shown fully populated in 24 slots (12 per processor)
5. Optional secondary PCIe riser
6. Default primary PCIe riser
7. UPI connectors for upper CPU mezzanine board kit
8. 2 Processors, heatsink showing
9. DDR4 DIMM slots. Shown fully populated in 24 slots (12 per processor)
10. Fan cage shown with 6 standard Hot-plug fans
11. HPE Smart Storage Battery 1 or HPE Smart Storage Hybrid Capacitor
12. HPE Smart Storage Battery 2
13. (Under) Hot Plug redundant HPE Flexible Slot Power supplies
14. Optional Tertiary riser
15. Handle for removing upper CPU Mezzanine Board Kit

What's New

- Now supporting additional processors in the second generation Intel Xeon family that provide an improved price performance
- New ProLiant DX560 24SFF Gen10 Platform
- Qualified platforms / configs recognized by both HPE & Nutanix
- Factory tuned & optimized HW settings for Nutanix environments
- Factory pre-installed Nutanix AHV & AOS

Form Factor

2U Rack Form Factor
Notes: Entry, Base and Performance pre-configured models ship with Gen10 Easy Install Rail Kits and Cable Management Assembly

Chassis Types

24 SFF

System Fans

6 Hot Plug Fans (with N+1 redundancy)
Notes: 6 hot plug fans are shipped as standard.

Standard Features

Processors

Four of the following processors are required.
Notes:
– The 2nd digit of the processor model number "x1xx" and "x2xx" is used to denote the processor generation (i.e. 1=1stgeneration and 2=2nd generation)
– This table covers the public Intel offering only.
– For more information regarding Intel Xeon processors, please see thefollowing **http://www.intel.com/xeon**.

Processor Suffix	Description	Offering
L	Large memory tier	Up to 4.5 TB addressable memory per socket
N	NFV Optimized	Targeted at Network Function Virtualization (NFV) workloads. Intel® Speed Select Technology-Base Frequency improves performance by directing base frequency to high priority/bottleneck cores.
S	Search Optimized	Optimized base frequency to address 'search' workloads.
V	VM Density Optimized	Fosters enhanced VM density, allowing to support more/larger virtual machines per host.
Y	Speed Select	Intel® Speed Select Technology -Performance Profile increases base frequency when less cores are enabled.

		Allows greater flexibility, deployment options and platform longevity.

Intel Xeon Models	CPU Frequency	Cores	L3 Cache (MB)	Power	UPI	DDR4	Memory per socket
Platinum Processors - 2nd Generation Intel® Xeon® Scalable Processor Family							
Platinum 8280L Processor	2.7GHz	28	38.5	205W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8280 Processor	2.7GHz	28	38.5	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8276L Processor	2.2GHz	28	38.5	165W	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8276 Processor	2.2GHz	28	38.5	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8270 Processor	2.7GHz	26	35.75	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8268 Processor	2.9GHz	24	35.75	205W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8260L Processor	2.4GHz	24	35.75	165	3 @ 10.4 GT/s	2933 MT/s	4.5TB
Platinum 8260 Processor	2.4GHz	24	35.75	165W	3 @ 10.4 GT/s	2933 MT/s	1TB
Platinum 8253 Processor	2.2GHz	16	22	125W	3 @ 10.4 GT/s	2933 MT/s	1TB

Intel Xeon Models	CPU Frequency	Cores	L3 Cache (MB)	Power	UPI	DDR4	Memory per socket
Gold Processors - 2nd Generation Intel® Xeon® Scalable Processor Family							
Gold 6262V Processor	1.9GHz	24	33	135W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6256 Processor	3.6GHz	12	33	205W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6254 Processor	3.1GHz	18	24.75	200W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6252 Processor	2.1GHz	24	35.75	150W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6248 Processor	2.5GHz	20	27.5	150W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6246 Processor	3.3GHz	12	24.75	165W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6244 Processor	3.6GHz	8	24.75	150W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6242 Processor	2.8GHz	16	22	150W	3 @ 10.4 GT/s	2933MT/s	1TB

Intel Xeon Models	CPU Frequency	Cores	L3 Cache (MB)	Power	UPI	DDR4	Memory per socket
Gold 6240L Processor	2.6GHz	18	27.75	150W	3 @ 10.4 GT/s	2933MT/s	4.5TB
Gold 6240 Processor	2.6GHz	18	24.75	150W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6238L Processor	2.1GHz	22	30.25	140W	3 @ 10.4 GT/s	2933MT/s	4.5TB
Gold 6238 Processor	2.1GHz	22	30.25	140W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6234 Processor	3.3GHz	8	24.75	130W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6230N Processor	2.3GHz	20	27.5	125W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6230 Processor	2.1GHz	20	27.5	125W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6226 Processor	2.7GHz	12	19.25	125W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 6222V Processor	1.8GHz	20	27.5	115W	3 @ 10.4 GT/s	2933MT/s	1TB
Gold 5220S Processor	2.6GHz	18	24.75	125W	2 @ 10.4 GT/s	2666MT/s	1TB
Gold 5220 Processor	2.2GHz	18	24.75	125W	2 @ 10.4 GT/s	2666MT/s	1TB
Gold 5218 Processor	2.3GHz	16	22	125W	2 @ 10.4 GT/s	2666MT/s	1TB
Gold 5217 Processor	3.0GHz	8	11	115W	2 @ 10.4 GT/s	2666MT/s	1TB
Gold 5215 Processor	2.5GHz	10	13.75	85W	2 @ 10.4 GT/s	2666MT/s	1TB

Notes:

– Platinum - 82xx series - 2 and 4 socket capable, 3UPI @ 10.4 GT/s, 6-Channel DDR4 @ 2933 MT/s 1DPC, 1 TB memory capacity (up to 2 TB on 'M' SKUs and up to 4.5 TB on 'L' SKUs), Intel Turbo Boost Technology, Intel Hyper-Threading Technology, Intel AVX-512 (2x 512-bit FMA), 48 lanes PCIe 3.0, advanced RAS.

– Gold - 62xx and 52xx series - 2 and 4 socket capable, 3UPI @ 10.4 GT/s on 62xx processors, 2UPI @ 10.4 GT/s on 52xx processors, 6 Channel DDR4 @ 2933 MT/s 1DPC on 62xx and 5222 processors , 6-Channel DDR4 @ 2666 MT/s on 52xx processors, 1 TB memory capacity (up to 2 TB on 'M' SKUs and up to 4.5 TB on 'L' SKUs), Intel Turbo Boost Technology, Intel Hyper-Threading Technology, Intel AVX-512(1x 512-bit FMA) (SKU 5222 supports 2x 512 bit FMA), 48 lanes PCIe 3.0, advanced RAS.

– With the current HPE DDR4 Smart Memory maximum offering (128GB LRDIMMs), the 'L' SKUs and 'M' SKUs can support up to 1.5TB per socket.

– More than 1.5TB per socket requires the use of HPE Persistent Memory kits : available in 512GB, 256GB and 128GB
– Platinum 8260Y and Gold 6240Y processors support Intel® Speed Select Technology -Performance Profile
– Gold 5218B processor and Gold 5218 processor have the same specifications and cannot be mixed within a server
– Gold 6252N, 6230N and 5218N processors are optimized for NFV (Network Function Virtualization) workloads and support Intel® Speed Select Technology -Base Frequency
– Gold 6262V and 6222V are VM density optimized, Gold 5220S is search-optimized
– 82xx, 62xx and 52xx processors offer VNNI (vector neural network instruction) instruction set.

Chipset
Intel C621 Chipset
For more information regarding Intel® chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/

On System Management Chipset
HPE iLO 5 ASIC
Read and learn more in the **iLO QuickSpecs**.

Memory
One of the following depending on model

Type:	Smart Memory Registered (RDIMM), Load Reduced (LRDIMM)	
DIMM Slots Available	48	12 DIMM slots per processor, 6 channels per processor, 2 DIMMs per channel
With 2nd generation processors		
Maximum capacity (LRDIMM)	6 TB	48 x 128 GB LRDIMM @2933 MT/s 2 DPC
Maximum capacity (RDIMM)	1.5 TB	24 x 64 GB RDIMM @ 2933 MT/s 1 DPC
	3 TB	48 x 64 GB RDIMM @ 2666 MT/s 2 DPC
Maximum capacity (HPE Persistent Memory)	12 TB	24 x 512 GB Persistent Memory Kit @2666 MT/s
With 1st generation processors		
Maximum capacity (LRDIMM)	6 TB	48 x 128 GB LRDIMM @ 2666 MT/s
Maximum capacity (RDIMM)	1.5 TB	48 x 32 GB RDIMM @ 2666 MT/s
Maximum capacity (NVDIMM)	384 GB	24 x 16 GB NVDIMM @ 2666 MT/s

Notes:
– The 2933 MT/s DIMMs are only supported with the 2nd generation Intel® Xeon® Scalable processors (82xx,62xx and 52xx).
– The 2666 MT/s DIMMs are only supported with the 1st generation Intel® Xeon® Scalable processors (81xx,61xx and 51xx)
– HPE Persistent Memory is only supported on the 2nd generation processors
– HPE Persistent Memory operates in two modes - memory mode and app direct mode.
– In memory mode, DRAM acts as a cache while HPE Persistent Memory provides large memory capacity which is volatile. DRAM installed does not count towards total memory capacity.
– In app direct mode, data that needs to be made persistent can be routed to HPE Persistent Memory. Both DRAM and HPE Persistent Memory count towards total memory capacity.
– Mixing of RDIMM and LRDIMM memory is not supported.
– The maximum memory speed is a function of the memory type, memory configuration, and processor model.
– Intel memory processors (with suffix M) are needed for supporting 1.5 TB memory per socket on 1st generation processors.
– Intel memory processors (with suffix M or suffix L) are needed for supporting more than 1 TB memory per socket on 2nd generation processors
– Maximum of 6 NVDIMMs are supported per processor on the 1st generation processors
– NVDIMMs are not supported on the 2nd generation processors

Memory Protection
For details on the HPE Server Memory Options RAS feature, visit: **http://www.hpe.com/docs/memory-ras-feature**.

Expansion Slots

Primary Riser (Standard)				
Expansion Slots #	**Technology**	**Bus/Connector Width**	**Form Factor/Connector**	**Notes**
1	PCIe 3.0	x8	¾ length/full height	Proc 1
2	PCIe 3.0	X16	¾ length/full height	Proc 1
3	PCIe 3.0	x8	¾ length/full height	Proc 1
None	2 x M.2	SATA lanes	M.2	Chipset

Primary/Secondary Riser (Optional) 873418-B21				
Expansion Slots (Primary/ Secondary) #	**Technology**	**Bus/Connector Width**	**Form Factor /Connector**	**Notes (Primary/ secondary)**
None	NVMe	x8	Slimline	Proc 1/2
None	NVMe	x8	Slimline	Proc 1/2

None	NVMe	x8	Slimline	Proc 1/2
None	NVMe	x8	Slimline	Proc 1/2

Secondary Riser (Optional) 870548-B21				
Expansion Slots #	**Technology**	**Bus Width**	**Form Factor**	**Notes**
4	PCIe 3.0	x8	Half length/full height	Proc 2
5	PCIe 3.0	x16	Half length/full height	Proc 2
6	PCIe 3.0	x8	Half length/full height	Proc 2

Tertiary riser (Optional) 872253-B21				
Expansion Slots #	**Technology**	**Bus Width**	**Form Factor**	**Notes**
7	PCIe 3.0	x8	Half length/full height	Proc 2
8	PCIe 3.0	x8	Half length/full height	Proc 2

Tertiary riser (Optional) 872255-B21				
Expansion Slots #	**Technology**	**Bus Width**	**Form Factor/Connector**	**Notes**
7	PCIe 3.0	x8	Half length/full height	Proc 2
None	NVMe	x8	Slimline	Proc 2

Tertiary riser (Optional) 872257-B21				
Expansion Slots #	**Technology**	**Bus Width**	**Form Factor/Connector**	**Notes**
None	NVMe	x8	Slimline	Proc 2
None	NVMe	x8	Slimline	Proc 2

Primary/Secondary Riser (Optional) 826704-B21					
Expansion Slots (Primary/ Secondary) #	**Technology**	**Bus/ConnectorWidth**	**Form Factor/ Connector (Primary)**	**Form Factor/ Connector (Secondary)**	**Notes (Primary/ secondary)**
2/5	PCIe 3.0	x16	¾ length/full height	Half length/full height	Proc 1/2
3/6	PCIe 3.0	x16	¾ length/full height	Half length/full height	Proc 1/2

Primary/Secondary Riser (Optional) 873420-B21					
Expansion Slots (Primary/ Secondary)#	**Technology**	**Bus/Connector Width**	**Form Factor/ Connector (Primary)**	**Form Factor/ Connector (Secondary)**	**Notes (Primary/ Secomdary)**
1/4	PCIe 3.0	x8	¾ length/full height	Half length/full height	Proc 1/2
2/5	PCIe 3.0	x8	¾ length/full height	Half length/full height	Proc 1/2
3/6	PCIe 3.0	x8	¾ length/full height	Half length/full height	Proc 1/2
None	NVMe	x8	Slimline	Slimline	Proc 1/2

Notes:

– The secondary and tertiary risers need the 2nd processor to be installed.
– The expansion slots at the back are numbered in ascending order from top to bottom and from left to right.
– Some riser kits (826704-B21, 873418-B21, 873420-B21) have FIO options with separate numbers and they do not ship with riser cages. Please review the FIO section for details.
– For additional details on ProLiant DL Gen10 server risers please visit: **https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00043229enw**.
– The optional 4-port NVMe Mezzanine card 874633-B21 supports a maximum of 8 NVMe drives and does not consume a PCIe slot. It goes on top of the HPE DL5x0 Gen10 CPU Mezzanine Board Kit (872222-B21) or HPE DL5x0 Gen10 CPU Version 2 Mezzanine Board Kit (P07991-B21) and requires a four processor configuration.
– The tertiary risers can only be installed when using two PSUs. There is no space for tertiary risers when the four PSU's are installed. If a secondary riser is required it needs to be ordered separately. Please refer section HPE I/O Expansion Options.
– A maximum of 1 primary, 1 secondary and 1 tertiary riser can be installed in one server.
– Slimline riser kit (873418-B21) does not contain any additional PCIe slots.

Storage Controllers

The Gen10 controller naming framework has been updated to simplify identification as depicted below. For a more detailed breakout of the available Gen10 Smart Array controllers visit the **https://www.hpe.com/psnow/doc/a50002563enw**

Software RAID

HPE Smart Array S100i SR Gen10 SW RAID

Notes:

– HPE Smart Array S100i SR Gen10 SW RAID will operate in UEFI mode only. For legacy support an additional controller will be needed, and for CTO orders please also select the Legacy mode settings part, 758959-B22.
– HPE Smart Array S100i SR Gen10 SW RAID is off by default and must be enabled. For enabling, please select HPE FIO Enable Smart Array SW RAID (784308-B21).

Essential RAID

- HPE Smart Array E208i-a SR G10 LH Controller
- HPE Smart Array E208i-p SR Gen10 Controller

Maximum Internal Storage

	Capacity	Configuration
Hot Plug SFF SATA HDD	48 TB	24 x 2 TB
Hot Plug SFF SAS HDD	58 TB	24 x 2.4 TB
Hot Plug SFF SATA SSD	184 TB	24 x 7.68 TB
Hot Plug SFF SAS SSD	367 TB	24 x 15.3 TB

Interfaces	
Serial	1 rear
Video	1 front (optional with Universal Media Bay), 1 rear
HPE iLO Remote Management Network Port	1
HPE iLO Front Service Port	1
Micro SD Slot	1 (Internal), 2 (optional, internal)
Notes: Requires the optional HPE Dual Micro SD 8GB USB kit.	
USB 2.0 Ports	4 total: 2 front (optional); 2 rear
USB 3.0 Ports	5 total: 1 front; 2 rear, 2 internal
Notes: 2 front (optional) USB 2.0 ports need the HPE DL560 Gen10 Universal Media Bay Kit (872267-B21).	

iLO RESTful API

iLO RESTful API is Redfish API conformance and offers simplified server management automation such as configuration and maintenance tasks based on modern industry standards. Learn more at **http://www.hpe.com/info/restfulapi**.

Industry Standard Compliance

- ACPI 6.1 Compliant
- PCIe 3.0 Compliant
- WOL Support
- Microsoft® Logo certifications
- PXE Support
- USB 3.0 Compliant (internal); USB 2.0 Compliant (external ports via SUV)
- SMBIOS 3.1
- UEFI 2.6
- Redfish API

Notes: For additional technical thermal details regarding ambient temperatures, humidity and features support please visit:
http://www.hpe.com/servers/ashrae.

Power Supply

One of the following depending on model

- HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
  Notes:
  – Available in 94% and 96% efficiency.
  – Also available in -48VDC and 227VAC/380VDC power inputs.
  – Must order 4x800W Flex Slot PSU.
- HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
  Notes:
  – Available in 94% efficiency.
  – 1600W Power supplies only support high line voltage (200VAC to 240VAC).

HPE Flexible Slot (Flex Slot) Power Supplies share a common electrical and physical design that allows for hot plug, tool-less installation into HPE ProLiant Gen10 Servers. Flex Slot power supplies are certified for high-efficiency operation and offer multiple power output options, allowing users to "right-size" a power supply for specific server configurations. This flexibility helps to reduce power waste, lower overall energy costs, and avoid "trapped" power capacity in the data center.
All pre-configured servers ship with a standard 6-foot IEC C-13/C-14 jumper cord (416151-B21). This jumper cord is also included with each standard AC power supply option kit. If a different power cord is required, please check the **ProLiant Power Cables** web page.
To review the power requirements for your selected system, please use the **HPE Power Advisor Tool**.
For information on power specifications and technical content visit **HPE Server power supplies**

Operating Systems and Virtualization Software Support for ProLiant Servers

- Nutanix Acropolis Operating System (AOS): Version 5.10.5 and higher
- Nutanix Acropolis Hypervisor (AHV): Version 2017030.279 and higher
- VMware vSphere: Version 6.5 U2, 6.5 U3, 6.7 U3
  Notes: The latest version of AOS and AHV are pre-installed in each server at the factory.

Graphics

- Integrated Video Standard
- Video modes up to 1920 x 1200@60Hz (32 bpp)

- 16MB Video Memory
- HPE iLO 5 on system management memory
- 32 MB Flash
- 4 Gbit DDR 3 with ECC protection

Embedded Management

HPE Integrated Lights-Out (HPE iLO)
Monitor your servers for ongoing management, service alerting, reporting and remote management with HPE iLO.
Learn more at **http://www.hpe.com/info/ilo**.

UEFI

Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI)

Intelligent Provisioning

Hassle free server and OS provisioning for one or more servers with Intelligent Provisioning.

HPE Server UEFI/Legacy ROM

Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better manageability and more secured configuration than the legacy ROM while interacting with your server at boot time. HPE ProLiant Gen10 servers have a UEFI Class 2 implementation and support both UEFI Mode (default) and Legacy BIOS Mode.
Notes: The UEFI System Utilities tool is analogous to the HPE ROM-Based Setup Utility (RBSU) of legacy BIOS.
UEFI enables numerous new capabilities specific to HPE ProLiant servers such as:

- Secure Boot and Secure Start enable for enhanced security
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.0 Stack
- Embedded UEFI Shell
- Mass Configuration Deployment Tool using iLO RESTful API that is Redfish API Conformant
- PXE boot support for IPv6 networks
- Workload profiles for simple performance optimization

UEFI Boot Mode only

- TPM 2.0 support
- NVMe Boot Support
- Platform Trust Technology (PTT) can be enabled
- iSCSI Software Initiator Support
- HTTP/HTTPs Boot support as a PXE alternative
- Boot support for option cards that only support a UEFI option ROM

  Notes:
  - For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.
  - UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory for your HPE ProLiant Gen10 Server.

Server Utilities

Active Health System
The HPE Active Health System (AHS) is an essential component of the iLO management portfolio that provides continuous, proactive health monitoring of HPE servers. Learn more at **http://www.hpe.com/servers/ahs**.

Active Health System Viewer
Use the Active Health System Viewer, a web-based portal, to easily read AHS logs and speed problem resolution with HPE self-repair recommendations, to learn more visit: **http://www.hpe.com/servers/ahsv**.

Smart Update
Keep your servers up to date with the HPE Smart Update solution by using Smart Update Manager (SUM) to optimize the firmware and driver updates of the Service Pack for ProLiant (SPP). Learn more at **https://www.hpe.com/us/en/servers/smart-update**.

iLO Amplifier Pack
Designed for large enterprise and service provider environments with hundreds of HPE servers, the iLO Amplifier Pack is a free, downloadable open virtual application (OVA) that delivers the power to discover, inventory and update Gen8, Gen9 and Gen10 HPE servers at unmatched speed and scale. Use with an iLO Advanced License to unlock full capabilities.
Learn more at **http://www.hpe.com/servers/iLOamplifierpack**.

HPE iLO Mobile Application
Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit:
http://www.hpe.com/info/ilo/mobileapp.

RESTful Interface Tool
RESTful Interface tool (iLOREST) is a single scripting tool to provision using iLO RESTful API to discover and deploy servers at scale. Learn more at **http://www.hpe.com/info/resttool**.

Scripting Tools
Provision one to many servers using your own scripts to discover and deploy with Scripting Tool (STK) for Windows and Linux or Scripting Tools for Windows PowerShell. Learn more at
http://www.hpe.com/servers/powershell.

HPE OneView Standard
HPE OneView Standard can be used for inventory, health monitoring, alerting, and reporting without additional fees. It can monitor multiple HPE server generations. The user interface is similar to the HPE OneView Advanced version, but the software-defined functionality is not available. Learn more at **http://www.hpe.com/info/oneview**.

HPE Systems Insight Manager (HPE SIM)
Ideal for environments already using HPE SIM, it allows you to monitor the health of your HPE ProLiant Servers and HPE Integrity Servers. Also provides you with basic support for non-HPE servers. HPE SIM also integrates with Smart Update Manager to provide quick and seamless firmware updates. Learn more at **http://www.hpe.com/info/hpesim**.

Security

- UEFI Secure Boot and Secure Start support
- Immutable Silicon Root of Trust
- FIPS 140-2 validation (iLO 5 certification in progress)
- Common Criteria certification (iLO 5 certification in progress)
- Configurable for PCI DSS compliance
- Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser
- Support for Commercial National Security Algorithms (CNSA)
- Granular control over iLO interfaces
- Smart card (PIV/CAC) and Kerberos based 2-factor Authentication
- Tamper-free updates - components digitally signed and verified
- Secure Recovery - recover critical firmware to known good state on detection of compromised firmware
- Ability to rollback firmware. Secure erase of NAND/User data
- TPM (Trusted Platform Module) 1.2 option.TPM (Trusted Platform Module) 2.0 option Bezel Locking Kit
- Chassis Intrusion detection option

Notes:
– HPE Trusted Platform Module 2.0 Option (864279-B21) works with Gen10 servers with UEFI Mode and not Legacy Mode. The Trusted Platform Module 2.0 Option can be configured to the 1.2 version through the UEFI BIOS to support TPM 1.2 functionality.
– HPE server systems can have a TPM module (of any type) installed only once. It cannot be replaced with any other TPM module.

About Trusted Platform Module

Trusted Platform Module (TPM) is a separate processor that monitors the system state. TPM is a passive component needing to be updated and not able to lock down any component in the system except access to its own memory. It also provides some cryptographic operations - among them: creating RSA key pairs, and working with them.

The first verification of signatures happens by code on the CPU, which can be intercepted and replaced. Emulating a "properly" booted system is possible by sending the right values to the TPM.

HPE supports two version of TPM, the 1.2 device and the 2.0 device. The TPM 2.0 device works with Gen10 servers that are using a Linux operating system or Microsoft Windows Server 2016. Both TPM 1.2 and 2.0 are compatible with HPE ProLiant Gen9 and Gen10 servers. These TPM modules are not compatible with server generations prior to Gen9. Once the TPM module is installed, it locks into place and cannot be removed, nor can it be replaced with a different TPM device.

HPE Silicon Root of Trust

The HPE Silcon Root of Trust provides protection because as soon as the server is powered on and the iLO firmware comes alive, it looks into the silicon for the immutable fingerprint that verifies all the firmware code is valid and uncompromised. Over a million lines of firmware code run, before the operating system starts, making it essential to confirm that all server essential firmware is free from malware or compromised code.

Silicon Root of Trust is included with iLO5 Standard with all platforms that contain the iLO5 chip. That includes ML, DL, Apollo, C-Class Blades, and Synergy Compute Modules. HPE Cloudline and the HPE Microserver do not have silicon root of trust, since they do not contain an iLO5 silicon chip. This technology is NOT available on any previous version of HPE ProLiant like the Gen9, Gen8, or Gen 7 servers, nor can those previous generations be retrofitted to accommodate the silicon root of trust.

The silicon validates the iLO 5 firmware code before it is fetched and executed. If any malware or compromised code has been inserted in the iLO 5 firmware, the silicon will detect that, because any infected firmware code will not match-up with the hash burned into the silicon. From there, the iLO 5 firmware validates the rest of the server firmware, namely the UEFI, CPLD, IE, and ME. The UEFI then validates the connection to the operating system, thus completing a complete root, or chain, that is anchored into the silicon.

During operation of the server, HPE has a new technology that conducts run-time firmware validation that checks the firmware stored in the server. At any point, if compromised code or malware is inserted in any of the critical firmware, an iLO audit log alert is created to notify the customer that a compromised has occurred. In the unlikely event of a breach into the HPE server firmware, after detection has been completed, the customer may then securely recover the firmware automatically to a previous known good state. HPE provides this function through HPE iLO Advanced license..

Warranty

This product is covered by a global limited warranty and supported by HPE Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Services

operational services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at: **https://www.hpe.com/support/ProLiantServers-Warranties**

Optional Features

Server Management

HPE iLO Advanced
HPE iLO Advanced licenses offer smart remote functionality without compromise, for all HPE ProLiant servers. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality.

HPE OneView Advanced
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. It provides full-featured licenses which can be purchased for managing Gen8, Gen9 and Gen10 servers. To learn more visit **http://www.hpe.com/info/oneview**.

HPE InfoSight for Servers
HPE InfoSight for Servers combines the cloud-based machine learning of 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.
Learn more at **https://www.hpe.com/servers/infosight**

HPE Insight Cluster Management Utility (CMU)
HPE Insight Cluster Management Utility is a HyperScale management framework that includes software for the centralized provisioning, management and monitoring of nodes and infrastructure. Learn more at **http://www.hpe.com/info/cmu**.

GPGPU Information
HPE NVIDIA Quadro P2000 Graphics Accelerator

Rack and Power Infrastructure

The story may end with servers, but it starts with the foundation that makes compute go - and business grow. We have reinvented our entire portfolio of rack and power products to make IT infrastructure more secure, more practical, and more efficient. In other words, we've created a stronger, smarter, and simpler infrastructure to help you get the most out of your IT equipment. As an industry leader, Hewlett Packard Enterprise is uniquely positioned to address the key concerns of power, cooling, cable management and system access.
HPE G2 Advanced and Enterprise Racks are perfect for the server room or today's modern data center with enhanced airflow and thermal management, flexible cable management, and a 10 year Warranty to support higher density computing.
HPE G2 PDUs offer reliable power in flexible form factors that operate at temperatures up to 60°, include color-coded outlets and load segments and a low-profile design for optimal access to the rack and support for dense rack environments.
HPE Uninterruptible Power Systems are cost-effective power protection for any type workload. Some UPSs include options for remote management and extended runtime modules so you're critical dense data center is covered in power outages.
HPE KVM Solutions include a console and switches designed to work with your server and IT equipment reliably. We have got a cost-effective KVM switch for your first rack and multiple connection IP switches with remote management and security capabilities to keep your data center rack up and running.
Learn more about HPE Racks, KVM, PDUs and UPSs at **HPE Rack and Power Infrastructure**.

One Config Simple (SCE)

SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE, please contact Hewlett Packard Enterprise Customer Business Center or an Authorized Partner for assistance. **https://h22174.www2.hpe.com/SimplifiedConfig/Welcome#**

Service and Support

HPE Services

No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.
https://www.hpe.com/services

Consulting Services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.
https://www.hpe.com/services/consulting

HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.
HPE Managed Services | HPE

Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.
https://www.hpe.com/services/operational

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.
https://www.hpe.com/services/techcare

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:
https://www.hpe.com/services/lifecycle
For a list of the most frequently purchased services using service credits, see the **HPE Service Credits Menu**

Other Related Services from HPE Services:

HPE Education Services
Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.
https://www.hpe.com/services/training

Defective Media Retention
An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials
HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.
Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

How to Purchase Services
Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at **https://ssc.hpe.com/portal/site/ssc/**

AI Powered and Digitally Enabled Support Experience
Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience
Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.
https://support.hpe.com/hpesc/public/home/signin

Consume IT On Your Terms
HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are-the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE" **https://www.hpe.com/us/en/contact-hpe.html**
For more information
http://www.hpe.com/services

Configuration Information

This section lists some of the steps required to configure a Factory Integrated Model. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an HPE approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.

1. Factory Integrated Models must start with a CTO Server.
2. FIO indicates that this option is only available as a factory installable option.
3. All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.
4. Some options may not be integrated at the factory. Contact your local sales representative for additional information.

Step 1: Base Configuration **(choose one of the following configurable models)**

SKU Number	HPE ProLiant DX560 Gen10 24SFF Configure-to-order Server	P22006-B21
Chipset	Intel® C621 Chipset	
Processor	4 processor configuration would require optional HPE ProLiant HPE DL5x0 Gen10 CPU Mezzanine Board Kit (872222-B21) **Notes:** If 2nd generation Intel® Xeon® Scalable processors are being used (82xx, 62xx or 52xx series) the 4 processor configuration would require optional HPE DL5x0 Gen10 CPU Version 2 Mezzanine Board Kit (P07991-B21)	
DIMM Slots	24 DIMM slots for RDIMM, LRDIMM DDR4 Memory; (6 DIMM slots per processor can be used for NVDIMMs or can be used for HPE Persistent Memory) 48 DIMM configuration would require optional HPE ProLiant HPE DL5x0 Gen10 CPU Mezzanine Board Kit (872222-B21) and 4 processors **Notes:** If 2nd generation Intel® Xeon® Scalable processors are being used (82xx, 62xx or 52xx series) the 48 DIMM configuration would require optional HPE DL5x0 Gen10 CPU Version 2 Mezzanine Board Kit (P07991-B21)	
Network Controller	None. FlexibleLOM slot (various options can be chosen for networking; NIC cards also available via expansion slots)	
Storage Controller	1 x HPE Smart Array E208i-a SR Gen10 Controller 2 x HPE Smart Array E208i-p SR Gen10 Controller	
PCIe	3 PCIe 3.0 slots (8 PCIe 3.0 slots are available if second processor is chosen and a Secondary and Tertiary Riser Kits has been installed)	
Drive Cage - included	24 SFF	
Fans	6 hot plug fans, redundant	
Management	HPE iLO Standard with Intelligent Provisioning and (Standard); HPE OneView Standard (requires download) and HPE iLO Advanced, HPE OneView Advanced (require additional licenses)	
microSD Slots	1 microSD card slot (internal)	
TPM Connector	1 Trusted Platform Module (TPM) connector	
UEFI	BIOS Legacy mode (field configurable) or Unified Extensible Firmware Interface (UEFI) mode (default)	
USB	7 USB ports (2 USB 2.0 and 5 USB 3.0)	

Video Ports	2 video ports (1 front optional via the Universal Media Kit upgrade option, 1 rear)
Rails	Easy install rails and cable management arm are optional

Notes:

– Trade Agreement Act (TAA) and means that these SKUs are manufactured in countries that are part of the global trade act. This provides greater security assurance that these servers come from countries that signed the agreement act. This is particularly important to HPE customers in our federal sector and other verticals that have concerns about the country of origin for our solutions.

– TAA servers are only orderable in North America and Canada.

– PCIe slot availability is dependent on the number of processors and riser kits installed. Please refer to the "Expansion slots" section for more details.

– For the DX560 Gen10, the number of processors requires four installed.

– For four processors, the HPE DL5x0 Gen10 CPU Mezzanine Board Kit (872222-B21) is required if 1st generation Intel® Xeon® Scalable processors are being used

– For four processors, the HPE DL5x0 Gen10 CPU Version 2 Mezzanine Board Kit (P07991-B21) is required if 2nd generation Intel® Xeon® Scalable processors are being used.

– This aplies to CTO configurations, field upgrades may differ depending on field configuration.

Step 2a: Choose Processor Options

Processor Option Kits (Required Processor)

2nd Intel Xeon-Platinum

Intel Xeon-Platinum 8280 (2.7GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22942-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8280L (2.7GHz/28-core/205W) FIO Processor Kit for HPE ProLiant DL560 Gen10 — P07154-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8276 (2.2GHz/28-core/165W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22940-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8270 (2.7GHz/26-core/205W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22939-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8268 (2.9GHz/24-core/205W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22938-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8260 (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22936-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8260L (2.4GHz/24-core/165W) FIO Processor Kit for HPE ProLiant DL560 Gen10 — P07152-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold

Intel Xeon-Gold 6256 (3.6GHz/12-core/205W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P24738-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6254 (3.1GHz/18-core/200W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22932-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6252 (2.1GHz/24-core/150W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22931-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6248 (2.5GHz/20-core/150W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22930-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6246 (3.3GHz/12-core/165W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22929-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6244 (3.6GHz/8-core/150W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22928-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6242 (2.8GHz/16-core/150W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22927-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6240L (2.6GHz/18-core/150W) FIO Processor Kit for HPE ProLiant DL560 Gen10 — P11949-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6240 (2.6GHz/18-core/150W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22925-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6238 (2.1GHz/22-core/140W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22923-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6234 (3.3GHz/8-core/130W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22922-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6230 (2.1GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DX560 Gen10 — P22920-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6230N (2.3GHz/20-core/125W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22921-L21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6226 (2.7GHz/12-core/125W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22919-L21

Intel Xeon-Gold 5220 (2.2GHz/18-core/125W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22915-L21

Intel Xeon-Gold 5218 (2.3GHz/16-core/125W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22914-L21

Intel Xeon-Gold 5217 (3.0GHz/8-core/115W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22913-L21

Intel Xeon-Gold 5215 (2.5GHz/10-core/85W) FIO Processor Kit for HPE ProLiant DX560 Gen10 P22911-L21

Step 2b: Choose Memory Options

- Please select one or more memory from below.
  - For new Gen10 memory population rule whitepaper and optimal memory performance guidelines, please go to: **https://www.hpe.com/docs/memory-population-rules**
  - For Gen10 memory speed table, please go to: **https://www.hpe.com/docs/memory-speed-table**
  - For memory Reliability, Accessibility, Serviceability (RAS) features whitepaper like Gen10 Fast Fault Tolerance and legacy mirrored memory feature etc. please go to: **http://www.hpe.com/docs/memory-ras-feature**

Notes:

– The maximum memory speed and capacity is a function of the memory type, memory configuration, and processor model.

– DDR4-2933 Memory Kits are only supported with 2nd Generation Intel Xeon Scalable Series Processors.Only one of the following from each list unless otherwise noted

Registered DIMMs (RDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE DX 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit P18448-B21

- Standalone: P00920-B21

HPE DX 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit P18449-B21

- Standalone: P00922-B21

HPE DX 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit P18450-B21

- Standalone: P00924-B21

HPE DX 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit P18453-B21

- Standalone: P00930-B21

Load Reduced DIMMs (LRDIMMs)

HPE DX 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-24-21-21 Load Reduced Smart FIO Memory Kit P18454-B21

- Standlaone: P11040-B21

Step 2c: Choose Power Supplies

Only one or more of the following from each list unless otherwise noted

HPE Flex Slot Power Supplies

HPE DX 800W Flex Slot Titanium Hot Plug Low Halogen FIO Power Supply Kit P18224-B21

HPE DX 800W Flex Slot Platinum Hot Plug Low Halogen FIO Power Supply Kit P18223-B21

HPE DX 800W Flex Slot -48VDC Hot Plug Low Halogen FIO Power Supply Kit P25214-B21

HPE DX 1600W Flex Slot Platinum Hot Plug Low Halogen FIO Power Supply Kit P18222-B21

Notes:

– Select one or more power supplies. For 800W, 4 power supplies need to be selected.

– 1600W Power supplies only support high line voltage (200VAC to 240VAC).

– 800W Titanium power supplies support high line voltage (200VAC to 240VAC)

– Prior to making a power supply selection it is highly recommended that the HPE Power Advisor is run to determine the right size power supply for your server configuration. The HPE Power Advisor is located at:

– **http://www.hpe.com/info/hppoweradvisor**.

– All power supplies in a server should match. Mixing Power Supplies is not supported.

– HPE ProLiant servers ship with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs). Visit **HPE power cords** for a full list of optional power cords.

Step 2d: Choose network adapters

Only one of the following from each list unless otherwise noted

Network Adapters

HPE DX Ethernet 1Gb 4-port 366FLR FIO Adapter P18459-B21

- Standalone: 665240-B21

HPE DX Ethernet 1Gb 4-port 366T FIO Adapter P18460-B21

- Standalone: 811546-B21

HPE DX Ethernet 10/25Gb 2-port 640FLR-SFP28 FIO Adapter P18461-B21

- Standalone: 817749-B21

HPE DX Ethernet 10Gb 2-port 562SFP+ FIO Adapter P18455-B21

- Standalone: 727055-B21

HPE DX Ethernet 10Gb 2-port 562FLR-SFP+ FIO Adapter P18457-B21

- Standalone: 727054-B21

HPE DX Ethernet 10Gb 2-port 562FLR-T FIO Adapter P18458-B21

- Standalone: 817745-B21

HPE DX Ethernet 10Gb 2-port 562T FIO Adapter P18456-B21

- Standalone: 817738-B21

HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter 817721-B21
HPE Ethernet 10Gb 2-port BASE-T BCM57416 Adapter 813661-B21
HPE DX Ethernet 10/25Gb 2-port 640FLR-SFP28 FIO Adapter P18461-B21

- Standalone: 817749-B21

Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE P08443-B21
HPE DX Ethernet 10/25Gb 2-port 640SFP28 FIO Adapter P18462-B21

- Standalone: 817753-B21

HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter 817709-B21
Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 FIO Adapter for HPE DX P43273-B21

Step 3: Choose Additional Factory Integratable Options

Only one of the following from each list unless otherwise noted

Risers

HPE DL560 Gen10 4-port 8 NVMe Slimline FIO Riser Kit 876242-B21
HPE DL560 Gen10 x8/x8/x8 1-port 2 NVMe Slimline FIO Riser Kit 876245-B21

Notes: For additional details on ProLiant DL Gen10 server risers please visit:
https://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00043229enw

HPE OneView

HPE OneView w/o iLO including 3yr 24x7 Support 1-server FIO LTU P8B31A
HPE OneView for ProLiant DL Server including 3yr 24x7 Support FIO Bundle Physical 1-server LTU E5Y43A

BIOS Mode

HPE Legacy FIO Mode Setting 758959-B22

Notes: Selecting this option will change the UEFI BIOS setting into Legacy BIOS Setting.

Controller State

HPE FIO Enable Smart Array SW RAID 784308-B21

Notes: If not selecting an HPE Storage Controller, this option may be selected to support RAID and Hot-plug capabilities for SATA hard drives. The S100i does not support SAS hard drives.

Step 4: Choose Additional Options for Factory Integration from Core and additional Options sections below

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Core Options

Some options may not be integrated at the factory. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an Hewlett Packard Enterprise approved configurator. Contact your local sales representative for additional information.

HPE Processors

Intel Xeon-Platinum

Intel Xeon-Platinum 8280L (2.7GHz/28-core/205W) Processor Kit for HPE ProLiant DL560 Gen10 P07154-B21

Notes: Ships with Performance Heatsink

Intel Xeon-Platinum 8280 (2.7GHz/28-core/205W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22942-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8276 (2.2GHz/28-core/165W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22940-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8270 (2.7GHz/26-core/205W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22939-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8268 (2.9GHz/24-core/205W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22938-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8260 (2.4GHz/24-core/165W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22936-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Platinum 8260L (2.4GHz/24-core/165W) Processor Kit for HPE ProLiant DL560 Gen10 P07152-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold

Intel Xeon-Gold 6256 (3.6GHz/12-core/205W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P24738-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6254 (3.1GHz/18-core/200W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22932-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6252 (2.1GHz/24-core/150W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10 P22931-B21

Notes: Ships with Performance Heatsink.

Intel Xeon-Gold 6248 (2.5GHz/20-core/150W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22930-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6246 (3.3GHz/12-core/165W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22929-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6244 (3.6GHz/8-core/150W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22928-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6242 (2.8GHz/16-core/150W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22927-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6240L (2.6GHz/18-core/150W) Processor Kit for HPE ProLiant DL560 Gen10	P11949-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6240 (2.6GHz/18-core/150W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22925-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6238 (2.1GHz/22-core/140W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22923-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6234 (3.3GHz/8-core/130W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22922-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6230 (2.1GHz/20-core/125W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22920-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6230N (2.3GHz/20-core/125W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22921-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 6226 (2.7GHz/12-core/125W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22919-B21
Notes: Ships with Performance Heatsink.	
Intel Xeon-Gold 5220 (2.2GHz/18-core/125W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22915-B21
Intel Xeon-Gold 5218 (2.3GHz/16-core/125W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22914-B21
Intel Xeon-Gold 5217 (3.0GHz/8-core/115W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22913-B21
Intel Xeon-Gold 5215 (2.5GHz/10-core/85W) FIO2 Processor Kit for HPE ProLiant DX560 Gen10	P22911-B21

Notes:

– If more than one processor is desired select one xxxxxx-L21 and one or three corresponding xxxxxx-B21 processors. Mixing different processor models is not supported.

– Mixing of 1st and 2nd generation Intel® Xeon® Scalable processors - (8/6/5)1xx and (8/6/5)2xx models -is not supported

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Memory Selection

To streamline the configuration process for HPE ProLiant Gen10 servers and to provide the best product availability, HPE recommends memory from the list located here: **http://www.hpe.com/products/recommend**.
Best product availability is limited to US, Canada, and Latin America at this time.

HPE Memory

Hewlett Packard Enterprise memory from previous generation servers is not qualified or warranted with this HPE ProLiant Server. HPE Smart Memory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen10. For additional information, please see the **HPE Smart Memory QuickSpecs.**
LRDIMM and RDIMM are all distinct memory technologies and cannot be mixed within a server.

Registered DIMMs (RDIMMs) for 2nd Generation Intel Xeon Scalable Series

HPE DX 16GB (1x16GB) Single Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit — P18448-B21

- Standalone: P00920-B21

HPE DX 16GB (1x16GB) Dual Rank x8 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit — P18449-B21

- Standalone: P00922-B21

HPE DX 32GB (1x32GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit — P18450-B21

- Standalone: P00924-B21

HPE DX 64GB (1x64GB) Dual Rank x4 DDR4-2933 CAS-21-21-21 Registered Smart FIO Memory Kit — P18453-B21

- Standalone: P00930-B21

HPE DX 128GB (1x128GB) Quad Rank x4 DDR4-2933 CAS-24-21-21 Load Reduced Smart FIO Memory Kit — P18454-B21

- Standalone P11040-B21

HPE Drives

The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system

Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

Enterprise - 12G SAS - SFF Drives

HPE DX 2TB SAS 12G Midline 7.2K SFF (2.5in) SC 1yr Wty 512e FIO HDD

- Standalone: 881457-B21

Midline - 12G SAS - SFF Drives

HPE DX 2.4TB SAS 12G Enterprise 10K SFF (2.5in) SC 3yr Wty 512e Digitally Signed Firmware FIO HDD

- Standalone: 765466-B21

SSD Selection

To streamline the configuration process for HPE ProLiant Gen10 servers and to provide the best product availability, HPE recommends SSDs from the list located here: **http://www.hpe.com/products/recommend**.

Read Intensive - Gen4x4 NVMe - SFF - Solid State Drives

HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733a SSD

HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733a SSD

HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF SCN U.3 PM1733a SSD

Mixed Use - Gen4x4 NVMe - SFF - Solid State Drives

HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735a SSD

HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF SCN U.3 PM1735a SSD

Read Intensive - 6G SATA - SFF - Solid State Drives

HPE DX 1.9TB SATA 6G Read Intensive SFF SC PM893 FIO SSD

- Standalone: P47812-B21

HPE DX 1.92TB SATA 6G Read Intensive SFF SC S4520 FIO SSD

- Standalone: P47319-B21

HPE DX 3.84TB SATA 6G Read Intensive SFF SC PM893 FIO SSD

- Standalone: P47813-B21

HPE DX 3.84TB SATA 6G Read Intensive SFF SC S4520 FIO SSD

Mixed Use - 6G SATA - SFF - Solid State Drives

HPE 960GB SATA 6G Mixed Use SFF SC PM897 SSD

HPE DX 1.92TB SATA 6G Mixed Use SFF SC PM897 FIO SSD

- Standalone: P47816-B21

HPE DX 1.92TB SATA 6G Mixed Use SFF SC S4620 FIO SSD

- Standalone: P47325-B21

HPE DX 1.92TB SATA 6G Mixed Use SFF BC Multi Vendor FIO SSD

Notes: Multi-vendor SKUs are composed of numerous supplier manufactured SSDs within a given SATA capacity SKU. When ordering a particular SKU-B21 number the cu

Read Intensive - 24G SAS - SFF - Solid State Drives

HPE DX 3.84TB SAS 24G Read Intensive SFF SC PM1653 FIO SSD

- Standalone: P57577-B21

HPE DX 7.68TB SAS 12G Read Intensive SFF SC Multi Vendor FIO SSD

- Standalone: P57585-B21

Notes: Multi-vendor SKUs are composed of numerous supplier manufactured SSDs within a given SATA capacity SKU. When ordering a particular SKU-B21 number the cu

Mixed Use - 12G SAS - SFF - Solid State Drives

HPE DX 1.6TB SAS 12G Mixed Use SFF SC Multi Vendor FIO SSD

- Standalone P57625-B21

Notes: Multi-vendor SKUs are composed of numerous supplier manufactured SSDs within a given SATA capacity SKU. When ordering a particular SKU-B21 number the cu

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HPE Networking

25 Gigabit Ethernet adapters

HPE DX Ethernet 10/25Gb 2-port 640SFP28 FIO Adapter

- Standalone: 817753-B21

Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE

10 Gigabit Ethernet adapters

HPE DX Ethernet 10Gb 2-port 562SFP+ FIO Adapter

Standalone: 727055-B21

HPE DX Ethernet 10Gb 2-port 562T FIO Adapter

Standalone: 817738-B21

HPE Ethernet 10Gb 2-port BASE-T BCM57416 Adapter

Notes: A minimum of two Gigabytes (2 GB) of server memory is required per each adapter.
Direct Attach Cable (DAC) for copper environments or fiber transceivers and cables for fiber-optic environments must be purchased separately. Please see the related NIC (
https://www.hpe.com/us/en/product-catalog/servers/server-adapters.hits-12.html

1 Gigabit Ethernet adapters

HPE DX Ethernet 1Gb 4-port 366T FIO Adapter

Standalone: 811546-B21

100 Gigabit Ethernet adapters

Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 FIO Adapter for HPE DX

Standalone: P25960-B21

FlexibleLOM Adapters

HPE DX Ethernet 1Gb 4-port 366FLR FIO Adapter

- Standalone: 665240-B21

HPE DX Ethernet 10Gb 2-port 562FLR-SFP+ FIO Adapter

- Standalone: 727054-B21

HPE DX Ethernet 10Gb 2-port 562FLR-T FIO Adapter

- Standalone: 817745-B21

HPE Ethernet 10Gb 2-port FLR-T BCM57416 Adapter

HPE DX Ethernet 10/25Gb 2-port 640FLR-SFP28 FIO Adapter

- Standalone: 817749-B21

HPE Ethernet 10/25Gb 2-port FLR-SFP28 BCM57414 Adapter

Notes: Please see the NIC QuickSpecs for Technical Specifications and additional information: **https://www.hpe.com/us/en/product-catalog/servers/server-adapters.hi**

HPE I/O Expansion Options

HPE DX560 Gen10 2 x8 PCIe Tertiary FIO Riser Kit

- Satndalone: 872253-B21

HPE DX Gen10 x8/x16/x8 FIO Riser Kit

- Standalone: 870548-B21

HPE Power Supplies

HPE DX 1600W Flex Slot Platinum Hot Plug Low Halogen FIO Power Supply Kit

- Stanadalone: 830272-B21

Notes:

– Flex Slot Platinum Plus power supplies support power efficiency of up to 94% and include a C-14 power inlet connector that can support HPE Power Discovery Services (I

– 1600W Power supplies only support high line voltage (200VAC to 240VAC).

HPE DX 800W Flex Slot Platinum Hot Plug Low Halogen FIO Power Supply Kit

- Standalone: 865414-B21

Notes: Flex Slot Platinum power supplies support power efficiency of up to 94% and include a standard C-14 power inlet connector.

HPE DX 800W Flex Slot Titanium Hot Plug Low Halogen FIO Power Supply Kit

- Standalone: 865438-B21

Notes:

– 800W Titanium power supplies support high line voltage (200VAC to 240VAC).

– Flex Slot Titanium power supplies support power efficiency of up to 96% and include a standard C-14 power inlet connector

– Prior to making a power supply selection it is highly recommended that the HPE Power Advisor is run to determine the right size power supply for your server configuratior **http://www.hpe.com/info/hppoweradvisor**.

– All power supplies in a server should match. Mixing Power Supplies is not supported.

– Option kits contain the specified power supply and a PDU IEC cable.

– 1600W power supplies only support high line voltage.

– HPE ProLiant servers ship with an IEC-IEC power cord used for rack mounting with Power Distribution Units (PDUs). Visit **HPE power cords** for a full list of optional HPE

GPGPU information							
Part number	**Card**	**Qty support**	**Processor support**	**PCIe speed**	**8/16/24 SFF**	**Max. 8 NVMe**	**Greater than 8 NVMe**
Q0V77A	NVIDIA Quadro P2000 GPU Module	2	All	Gen3	35C	35C	30C

Notes:

– Check the power usage via the HPE Power Advisor Tool located at **http://www.hpe.com/info/hppoweradvisor**.

– A maximum of 2 GPU cards can be supported, 1 in primary riser expansion slot 2 and another in secondary riser expansion slot 5. Refer Expansion Slots sections for addi

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Additional Options

Some options may not be integrated at the factory. To ensure only valid configurations are ordered, Hewlett Packard Enterprise recommends the use of an HPE approved configurator. Contact your local sales representative for additional information.

iLO Advanced

HPE iLO Advanced Electronic License with 1yr Support on iLO Licensed Features	E6U59ABE
HPE iLO Advanced Electronic License with 3yr Support on iLO Licensed Features	E6U64ABE
HPE iLO Advanced 1-server License with 3yr Support on iLO Licensed Features	BD505A
HPE iLO Advanced Flexible Quantity License with 3yr Support on iLO Licensed Features	BD506A
HPE iLO Advanced AKA Tracking License with 3yr Support on iLO Licensed Features	BD507A
HPE iLO Advanced 1-server License with 1yr Support on iLO Licensed Features	512485-B21
HPE iLO Advanced Flexible Quantity License with 1yr Support on iLO Licensed Features	512486-B21
HPE iLO Advanced AKA Tracking License with 1yr Support on iLO Licensed Features	512487-B21

HPE Converged Infrastructure Management Software

HPE OneView Advanced (with HPE iLO Advanced)

HPE OneView including 3yr 24x7 Support Physical 1-server LTU	E5Y34A
HPE OneView including 3yr 24x7 Support Flexible Quantity E-LTU	E5Y35AAE
HPE OneView for ProLiant DL Server including 3yr 24x7 Support FIO Bundle Physical 1-server LTU	E5Y43A

HPE OneView Advanced (without HPE iLO Advanced)

HPE OneView w/o iLO including 3yr 24x7 Support 1-server LTU	P8B24A
HPE OneView w/o iLO including 3yr 24x7 Support Track 1-server LTU	P8B25A
HPE OneView w/o iLO including 3yr 24x7 Support Flexible Quantity E-LTU	P8B26AAE

HPE OneView w/o iLO including 3yr 24x7 Support 1-server FIO LTU P8B31A

Notes:

– Licenses ship without media. The HPE OneView Media Kit can be ordered separately, or can be downloaded at: **https://www.hpe.com/us/en/integrated-systems/software.html**.

– Electronic and flexible-quantity licenses can be used to purchase multiple licenses with a single activation key.

– Please see the **HPE OneView QuickSpecs** for technical specifications and additional information.

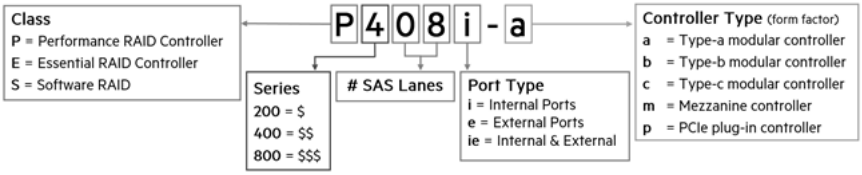
HPE Security

HPE Trusted Platform Module 2.0 Gen10 Option 864279-B21

Notes: HPE Trusted Platform Module 2.0 Option (864279-B21) works with Gen10 servers with UEFI Mode not Legacy Mode. It is not compatible with HPE ProLiant Gen9 servers or earlier generation variants.HPE server systems can have a TPM module (of any type) installed only once. It cannot be replaced with any other TPM module.

HPE Smart Array Controllers

The Gen10 controller naming framework has been updated to simplify identification as depicted below. For a more detailed breakout of the available Gen10 Smart Array controllers visit the **https://www.hpe.com/psnow/doc/a50002563enw**



Performance RAID Controllers

Notes: All performance RAID controllers are supported by either the HPE Smart Storage Battery (P01366-B21) or the HPE Smart Storage Hybrid Capacitor (P02377-B21), which support multiple devices and are sold separately.

HPE Smart Array P816i-a SR Gen10 (16 Int Lanes/4GB Cache/SmartCache) 12G SAS Modular LH Controller 869083-B21

Notes: Does not occupy a PCIe expansion slot.

HPE Smart Array P408i-a SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS Modular LH Controller 869081-B21

Notes: Does not occupy a PCIe expansion slot.

HPE Smart Array P408i-p SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS PCIe Plug-in Controller 830824-B21

HPE Smart Array P408e-p SR Gen10 (8 External Lanes/4GB Cache) 12G SAS PCIe Plug-in Controller 804405-B21

Essential RAID Controllers

HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular LH Controller 869079-B21

Notes: Does not occupy a PCIe expansion slot.

HPE Smart Array E208i-p SR Gen10 (8 Internal Lanes/No Cache) 12G SAS PCIe Plug-in Controller 804394-B21

HPE Smart Array E208e-p SR Gen10 (8 External Lanes/No Cache) 12G SAS PCIe Plug-in Controller 804398-B21

Optional Software

HPE Smart Array SR Secure Encryption (Data at Rest Encryption/per Server Entitlement) E-LTU Q2F26AAE

HPE Smart Array SR SmartCache (Single Key/Single Server) LTU D7S26A

Notes: SmartCache is offered on HPE Smart Array performance RAID controllers and comes standard (no licensing is required) if the HPE Smart Array P816i-a SR Gen10 LH Controller is installed in the server.

Optional Upgrades

HPE 96W Smart Storage Lithium-ion Battery with 145mm Cable Kit P01366-B21

Notes: Provides backup power for multiple HPE Smart Array controllers or other devices. Is required with performance RAID controllers and NVDIMMs.

HPE Rack Options

Please see the **HPE KVM Switches web page** for information on these products and their specifications.

Rail Kits

HPE 2U Large Form Factor Easy Install Rail Kit 733662-B21

Notes: Does not include CMA (733664-B21).

HPE 2U Cable Management Arm for Easy Install Rail Kit 733664-B21

HPE 2U Large Form Factor Ball Bearing Rail Kit 720864-B21

Notes: Does not include CMA (720865-B21).

HPE 2U Cable Management Arm for Ball Bearing Rail Kit 720865-B21

Notes:

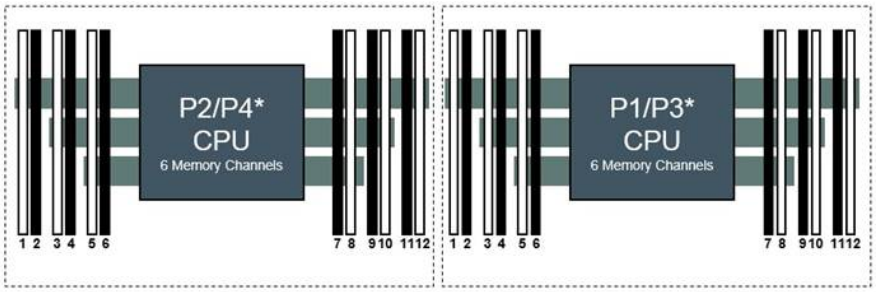
– Rail kits are optional for DX560 Gen10 and are no longer included standard with the server. Customers have the option to purchase their server without a rail kit.

– Ball bearing and Easy Install rail kits contain telescoping rails which allow for in-rack serviceability.

– Hewlett Packard Enterprise recommends that a minimum of two people are required for all Rack Server installations. Please refer to your installation instructions for proper tools and number of people to use for any installation.

– HPE rail kits are designed to work with HPE racks in compliance with industry standard EIA-310-E. In the event a customer elects to purchase a third-party rack for use with an HPE rail kit, any such use is at customer's own risk. HPE makes no express or implied warranties with respect to such third-party racks and specifically disclaims any implied warranties of merchantability and fitness for a particular purpose. Furthermore, HPE has no obligation and assumes no liability for the materials, design, specifications, installation, safety, and compatibility of any such third-party racks with any rail kits, including HPE rail kits.

Memory



HPE Proliant Gen10 DL360/ DL380/ DL560* Servers
(2 Slots per Channel)

Notes:*HPE Proliant DX560 is a 4 socket server (uses P3, P4)

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1 DIMM								8				
2 DIMM s								8		10		
3 DIMM s								8		10		12
4 DIMM s			3		5			8		10		
5 DIMM s*			3		5			8		10		12
6 DIMM s	1		3		5			8		10		12
7 DIMM s*	1		3		5		7	8		10		12
8 DIMM s			3	4	5	6	7	8	9	10		
9 DIMM s*	1		3		5		7	8	9	10	11	12
10 DIMM s*	1		3	4	5	6	7	8	9	10		12
11 DIMM s*	1		3	4	5	6	7	8	9	10	11	12
12 DIMM s	1	2	3	4	5	6	7	8	9	10	11	12

HPE ProLiant Gen10 12 slot per CPU

DIMM population order
Memory Population guidelines
Notes: *Unbalanced, not recommended

General Memory Population Rules and Guidelines:

- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two-processor system, only half of the DIMM slots are available.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors.
- When two processors are installed, balance the DIMMs across the two processors.
- White DIMM slots denote the first slot to be populated in a channel.
- Mixing of DIMM types (UDIMM, RDIMM, and LRDIMM) is not supported.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the number of DIMM slots on the platform, the largest DIMM capacity qualified on the platform, the number and model of installed processors qualified on the platform.
- For details on the HPE Server Memory Options Population Rules, visit:
  http://www.hpe.com/docs/memory-population-rules

To realize the performance memory capabilities listed in this document, HPE DDR4 Smart Memory is required.
For additional information, please see the **HPE DDR4 Smart Memory QuickSpecs**.

HPE 16GB NVDIMM for Gen10 Servers - Population Rules and Guidelines:

Maximum of (12) 16GB NVDIMMs for 2 socket servers and (24) 16GB NVDIMMs for 4 socket servers.
If NVDIMM-N interleaving is disabled, then any number of NVDIMM-Ns may be used, and the NVDIMM-Ns should be populated in this order:

- Choose a CPU with open slots (based on NUMA proximity), if any.
- Pick a channel with two open slots, if any. This keeps the NVDIMM-N from sharing bandwidth with regular memory populate the white slot.
- Pick a channel with an open slot that already has an NVDIMM-N rather than a regular DIMM, if any. This slot must be a black slot. Keep NVDIMM-N traffic away from regular DIMM traffic.

If NVDIMM-N interleaving is enabled, then the same interleaving balance restrictions that applied to regular DIMMs also apply to the NVDIMM-Ns using the remaining open slots. When assigning the NVDIMM-Ns to those open channels per the regular DIMM placement rules:

- It's important to keep the same number of DIMMs on the same memory controller.

- Choose the number of NVDIMM-Ns per CPU based on desired block device size and NUMA locality.
- Pick a memory controller with a channel with two open slots, if any.
- Pick a channel with two open slots, if any. This keeps the NVDIMM-N from sharing bandwidth with regular memory. Populate the white slot.

Please visit the **HPE Server Memory Options Population Rules** for detailed configuration rules and best practices.

Memory Speed Table for HPE ProLiant DX560 Gen 10

For the HPE Server Memory speed table, please visit: **https://www.hpe.com/docs/memory-speed-table**

Standard and Maximum Memory Capacity (Pre-configured Models)

Pre Configured Models	Standard Memory	Maximum Memory Plus Optional Memory	Standard Memory Replaced with Optional Memory
5120	32 GB (2 x 16 GB)	384 GB (24 x 16 GB)	6144GB (48 x 128 GB)
6130	64 GB (4 x 16 GB)	384 GB (24 x 16 GB)	6144GB (48 x 128 GB)
6148	128 GB (8 x 16 GB)	768 GB (48 x 16 GB)	6144GB (48 x 128 GB)
8170	256 GB (16 x 16 GB)	768 GB (48 x 16 GB)	6144GB (48 x 128 GB)
5220	64 GB (2 x 32 GB)	768 GB (24 x 32 GB)	6144GB (48 x 128 GB)
6230	128 GB (4 x 32 GB)	768 GB (24 x 32 GB)	6144GB (48 x 128 GB)
6254	256 GB (8 x 32 GB)	1536 GB (48 x 32 GB)	6144GB (48 x 128 GB)
8268	512 GB (16 x 32 GB)	1536 GB (48 x 32 GB)	6144GB (48 x 128 GB)

DDR4 memory options part number decoder

Notes: Capacity references are rounded to the common gigabyte (GB) values.

- 4 GB = 4,096 MB
- 8 GB = 8,192 MB
- 16 GB = 16,384 MB
- 32 GB = 32,768 MB
- 64 GB = 65,536 MB
- 128 GB = 131,072 MB

For more information on memory, please see the Memory Quickspecs: **HPE DDR4 Smart Memory**

Technical Specifications

System Unit

Dimensions

- (H x W x D) (with bezel)
  - 8.75cm x 44.54cm x 75.47cm
    3.44 x 17.54 x 29.71 in

Weight (approximate)

- 34.12 kg
  75.23 lb
  - Maximum: (all hard drives, power supplies, DIMMs and processors installed)
- 18.45 kg
  40.67 lb
  - Minimum: (one processor, one standard heatsink, one air baffle, one hard drive, one power supply, one DIMM, one rail kit with CMA and one primary riser installed)

Input Requirements (per power supply)

- **Rated Input Voltage**
  - 100 - 127 VAC, 200 - 240 VAC, 240VDC for China Only (800W Platinum PS only)
  - 200 - 240 VAC, 240VDC for China Only (800W Titanium PS only)
  - 200 V to 277 VAC, 380 VDC (800W Universal PS only)
  - -40 VDC to -72 VDC, -48 VDC nominal input (800W -48VDC PS only)
  - 200 - 240 VAC, 240 VDC for China only (1600W PS Only)
- **Rated Input Current**
  - 9.4 A (100 VAC), 4.5 A (200 VAC), 3.8 A at 240VDC for China Only (800W Platinum PS only)
  - 4.35 A at 200 VAC 3.62 A at
  - 240 VAC, 3.62 A at 240 VDC for China
  - Only (800W Titanium PS only)
  - 4.5 A at 200 V AC, 3.2 A at 277 V AC, 2.3 A at 380 VDC - (800W Universal PS only)
  - 26 A at -40 VDC input, 19 A at -48 VDC input, nominal input, 12.4 A at -72 VDC input - (800W -48VDC PS only)
  - 8.7 A at 200 VAC, 7.2 A at 240 VAC - (1600W PS Only)
- **Rated Input Frequency**
  - 50 to 60 Hz (Not applicable for VDC ranges)
- **Maximum Rated Input Power**
  - 940 W (100 VAC), 900 W (200VAC), 912 W at 240 VDC for China Only - (800W Platinum PS only)
  - 870 W at 200 VAC, 870 W at 240 VAC, 870 W at 240 VDC for China only - (800W Titanium PS only)
  - 900 W at 200 VAC, 887 W at 277 VAC, 874 W at 380 VDC - (800W Universal PS only)

- 936 W at -40 VDC input 912 W at -48 VDC input, nominal input 900 W at -72 VDC input - (800W -48VDC PS only)
- 1734 W at 200 VAC 1720 W at 240 VAC - (1600W PS Only)

BTU Rating

- **Maximum**
  - 3207 BTU/hr at 100 VAC, 3071 BTU/hr at 200 VAC, 3112 BTU/hr at 240 for China only - (800W Platinum PS only)
  - 2969 BTU/hr at 200 VAC, 2969 BTU/hr at 240 VAC, 2969 BTU/hr at 240 VDC for China only - (800W Titanium PS only)
  - 3071 BTU/hr at 200 VAC, 3026 BTU/hr at 277 VAC, 2982 BTU/hr at 380 VDC - (800W Universal PS only)
  - 3194 BTU/hr at -40 VDC input, 3112 BTU/hr at -48 VDC input (nominal input), 3071 BTU/hr at -72 VDC input - (800W -48VDC PS only)
  - 5918 BTU/hr at 200 VAC, 5884 BTU/hr at 240 VAC - (1600W PS Only)

Power Supply Output (per power supply)

- **Rated Steady-State Power**
  - 800 W at 100 VAC to 127 VAC input, 800 W at 200 VAC to 240 VAC input, 800 W at 240 VDC input for China only - (800W Platinum PS only)
  - 800 W at 200 VAC to 240 VAC input, 800 W at 240 VDC input for China only - (800W Titanium PS only)
  - 800 W at 200 VAC to 277 VAC input, 800 W at 380 VDC input - (800W Universal PS only)
  - 800 W at -40 VDC to -72 VDC - (800W -48VDC PS only)
  - 1600 W at 200 VAC to 240 VAC input, 1600 W at 240 VDC input - (1600W PS Only)

- **Maximum Peak Power**
  - 800 W at 100 VAC to 127 VAC input, 800 W at 200 VAC to 240 VAC input, 800 W at 240 VDC input for China only - (800W Platinum PS only)
  - 800 W at 200 VAC to 240 VAC input, 800 W at 240 VDC input for China only - (800W Titanium PS only)
  - 800 W at 200 VAC to 277 VAC input, 800 W at 380 VDC input- (800W Universal PS only)
  - 800 W at -40 VDC to -72 VDC - (800W -48VDC PS only)
  - 2200 W for 1ms (turbo mode) at 200 VAC to 240 VAC input - (1600W PS Only)

Notes: To review typical system power ratings use the HPE Power Advisor which is available online located at url: **http://www.hpe.com/info/hppoweradvisor**.

System Inlet Temperature

- **Standard Operating Support**

10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed. System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F).

- **Extended Ambient Operating Support**

For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL:**http://www.hpe.com/servers/ashrae**

For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: **http://www.hpe.com/servers/ashrae**

System performance may be reduced if operating in the extended ambient operating range or with a fan fault.

- **Non-operating**

-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).

Relative Humidity

- **Operating**

8% to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.

- **Non-operating** (non-condensing)

5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.

Altitude

- **Operating**

3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

- **Non-operating**

9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).

Acoustic Noise

Listed are the declared A-Weighted sound power levels (LWAd) and declared average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to standard shipping configurations. Additional options may result in increased sound levels. Please have your HPE representative provide information from the HPE EMESC website for further technical details regarding the configurations listed below.

Product Configuration	Entry	Base	Performance
Idle - LWAd	5.0 B	5.1 B	5.1 B
Idle - LpAm	47 dBA	48 dBA	48 dBA
Operating - LWAd	5.3 B	5.7 B	5.6 B
Operating - LpAm	50 dBA	54 dBA	53 dBA

Notes: Acoustics levels presented here are generated by the test configuration only. Acoustics levels will vary depending on system configuration. Values are subject to change without notification and are for reference only.

Regulatory Information

To view the regulatory information for your product, view the Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products, available at the Hewlett Packard Enterprise Support Center: **http://www.hpe.com/support/Safety-Compliance-EnterpriseProducts**

HPE Smart Array

For latest information on **HPE Smart Array Gen10 Controllers for HPE ProLiant DL, ML and Apollo Servers** please refer to their QuickSpecs. (E208i-a,E208i-p,E208e-p,P408i-a,P408i-p,P408e-p,P816i-a)

Environment-friendly Products and Approach- End-of-life Management and Recycling

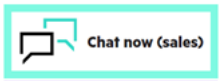
Hewlett Packard Enterprise offers **end-of-life product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.-
The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

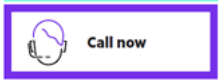
Summary of Changes

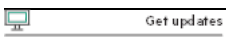
Date	Versio History	Action	Description of Change
18-Mar-2024	Version 8	Changed	Standard Features and Configuration Information sections were updated.
20-Nov-2023	Version 7	Changed	HPE Services Rebranding
03-Apr-2023	Version 6	Changed	Updated SSD's and processor min/max Core Options, and Configuration Information sections were updated.
12-Sep-2022	Version 5	Changed	Core Options, and Configuration Information sections were updated.
15-Nov-2021	Version 4	Changed	Core Options, Service and Support and Configuration Information sections were updated.
16-Mar-2020	Version 3	Changed	Standard Features section was updated.
24-Feb-2020	Version 2	Changed	Overview and Configuration Information sections were updated.
02-Dec-2019	Version 1	New	NewQuickSpecs

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