Overview

What's New

- Powered by 4th Generation Intel® Xeon® Scalable processors that support up to 60 core at 350W, 112.5 MB of L3 Cache, and 32 DIMMs for DDR5 memory up to 4800 MT/s.
- Increased memory bandwidth, performance and lower power requirements with DDR5 memory that support up to 8 TB memory capacity with 8 channels per processor.
- Advanced data transfer rates from the PCIe Gen5 serial expansion bus.
- Includes HPE Integrated Lights-Out 6 (iLO 6) server management software that enables you to securely configure, monitor, and update your HPE ProLiant Gen11 servers seamlessly from anywhere.
- Supports Tri-mode SFF backplane and hot-pluggable RAID1 protected NS204i-u M.2 NVMe boot option.

Platform Information

Form Factor

- 4U tower with rack conversion capability

Notes: When deployed as a Rack model, this system will take up 5U-height space in a standard data center rack facility.

Chassis Types

- 8 SFF chassis with optional Tri-mode SFF HDD cage kit (s), x4 NVMe SFF HDD cage kit and 1 slim-line DVD bay kit options
- 4 LFF chassis with optional LFF or SFF HDD cage kit (s), USB RDX docking station, up to 1 for each and 1 slim-line DVD bay kit options

Notes:

- Mixed SFF and LFF HDD cages is supported with LFF chassis, up to 3 drive cages.
- USB RDX docking station is supported up to 1 with LFF chassis.
- x4 NVMe SFF HDD cage kit is supported with SFF chassis, up to 1 drive cage.

System Fans

- Standard – fan types included

Notes:

- Base models typically ship with 3 standard fans as default with every ML350 Gen11 server operations.
- Performance models typically ship with 8 standard fans which provides N+1 redundant fan feature in most of the situations. For support detail or restriction, refer to **ML350 Gen11 User Guide.**
- Optional Redundant Fan Kit (P47219-B21) with Second CPU Fan Kit (P47902-B21) provides advanced cooling and redundancy functionality in heavier configurations. Configurations that require fan kit are provided in later sections.

Standard Features

Processors – Up to 2 of the following, depending on model.
Notes: For more information regarding Intel Xeon processors, please see the following
https://www.intel.sg/content/www/xa/en/processors/xeon/scalable/xeon-scalable-platform.html.

Intel Fourth Generation Xeon® Scalable Processors – Naming Decoder		
Processor Suffix	**Description**	**Offering**
P	Cloud – IaaS	Optimized for high performance IaaS for orchestration efficiency - IaaS higher freq. for VM environments
V	Cloud – SaaS	Designed for high rack density, maximize VM/core, and lower power VM environment
M	Media Transcode	Designed for Media Processing and Transcoding
H	DB and Analytics	Designed for Data Analytics and Big Data usages. Maximum capability for IAA, DSA, QAT, DLB and AMX. Supported on 2, 4 and 8 socket platforms.
N	Network/5G/Edge(High TPT/Low Latency)	Designed and optimized for a range of broadly-deployed network and 5G workload environments from edge to the data center. Support network solutions with lower latency, higher throughput, deterministic performance and extended supply life. Maximum capability for DLB, DSA and QAT – for Dynamic Load Balancing, Data Movement and Cryptography/Data Compression. 1S SKUs –Optimized for Network (default mode), CSP (Cloud mode) and Enterprise (Server mode)
S	Storage & HCI	Designed to provide maximum inter-socket bandwidth with lower core counts and TDPs. Extended product supply life. Maximum capability for DSA, QAT and DLB – for Data Movement and Data Compression
T	Long-life Use/High Tcase	Support for up to 10-year reliability. Select SKUs offer use for industrial commercial temperature conditions. Long life availability
U	1-Scoket Optimized*	Provides cost-effective 1S options at lower core counts, largely for Enterprise
Q	Liquid cooling	Provides higher frequencies
+	Feature +	Feature Plus SKU – Enabled 1 for each accelerators device of QAT, DLB, DSA, IAX

Intel Fourth Generation Xeon® Scalable Processors							
Intel Xeon Models	**CPU Frequency**	**Cores**	**L3 Cache**	**Power**	**UPI (16 GT/s)**	**DDR5**	**SGX Enclave size**
Gold Processors							
Gold 6430 Processor	2.1 GHz	32	60 MB	270W	3	4400 MT/s	128 GB
Gold 6414U Processor	2.0 GHz	32	60 MB	250W	N/A	4800 MT/s	128 GB
Gold 6454S Processor	2.2 GHz	32	60 MB	270W	4	4800 MT/s	128 GB
Platinum Processors							
Platinum 8460Y+ Processor	2.0 GHz	40	105 MB	300W	4	4800 MT/s	128 GB
Platinum 8468 Processor	2.1 GHz	48	105 MB	350W	4	4800 MT/s	512 GB
Platinum 8470 Processor	2.0 GHz	52	105 MB	350W	4	4800 MT/s	512 GB
Platinum 8480+ Processor	2.0 GHz	56	105 MB	350W	4	4800 MT/s	512 GB
Platinum 8452Y Processor	2.0 GHz	36	67.5 MB	300W	4	4800 MT/s	128 GB
Platinum 8470N Processor	1.7 GHz	52	97.5 MB	300W	3	4800 MT/s	128 GB
Platinum 8468V Processor	2.4 GHz	48	97.5 MB	330W	3	4800 MT/s	128 GB
Platinum 8458P Processor	2.7 GHz	44	82.5 MB	350W	3	4800 MT/s	512 GB

Notes:

- 80 PCIe 5.0 lanes per processor.
- "U" processors (i.e. 6414U) only supported in single socket configurations.
- Processors with TDP equal to or greater than 195W require Performance Heatsink (P47224-B21).
- Processors with TDP equal to or greater than 300W require both Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

Standard Features

Chipset
Intel® C741 Chipset
Notes: For more information regarding Intel® chipsets, please see the following URL:
https://www.intel.com/content/www/us/en/products/chipsets/server-chipsets.html

System Management Chipset
HPE iLO 6 ASIC
Notes: Read and learn more in the **iLO QuickSpecs**.

Memory
One of the following depending on model

Type	HPE DDR5 SmartMemory, Registered (RDIMM)
DIMM Slots Available	32 DIMM slots 16 DIMM slots per processor, 8 channels per processor, 2 DIMM per channel
Maximum capacity (RDIMM)	8.0TB 32 x 256 GB RDIMM* @ 4400MT/s at 2 DPC, 16 x 256 GB RDIMM* @ 4800 MT/s at 1 DPC

Notes:
— The maximum memory by socket is limited by the processor selection.
— Mixing of RDIMM and LRDIMM memory is not supported.
— For additional information, please see the **HPE DDR5 SmartMemory QuickSpecs**.
— For General Server Memory and Persistent Memory Population Rules and Guidelines for Gen11 see details here:
    http://www.hpe.com/docs/memory-population-rules

Memory Protection
Advanced ECC
Advanced ECC uses single device data correction to detect and correct single and all multibit error that occurs within a single DRAM chip.

Online Spare
Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.
Notes: For more information see our **Memory RAS feature technical whitepaper**.

Expansion Slots

Primary Riser
Notes:
— Bus width indicates the number of physical electrical lanes running to the connector.
— There are two Primary riser configurations:
   o   4x8 Primary Riser Kit provides 4 slots with PCIe Gen5 x8 on Slot1-4.
   o   2x16 Primary FIO Riser Kit provides 2 slots with PCIe Gen5 x16 on Slot2 & 4.

Primary Riser 4x8					
Slots #	**Processor**	**Technology**	**Bus Width**	**Connector Width**	**Slot Form Factor**
1	CPU 1	PCIe 5.0	X8	X16	Full-height,full-length slot
2	CPU 1	PCIe 5.0	X8	X16	Full-height,full-length slot
3	CPU 1	PCIe 5.0	X8	X16	Full-height,full-length slot
4	CPU 1	PCIe 5.0	X8	X16	Full-height,full-length slot

Standard Features

Primary Riser 2x16					
Slots #	**Processor**	**Technology**	**Bus Width**	**Connector Width**	**Slot Form Factor**
2	CPU 1	PCIe 5.0	X16	X16	Full-height,full-length slot
4	CPU 1	PCIe 5.0	X16	X16	Full-height,full-length slot

Notes:
- Bus Width Indicates the number of physical electrical lanes running to the connector.
- Slot 4 is routed from the PCH.

Secondary Riser
Notes:
- Bus width indicates the number of physical electrical lanes running to the connector.
- There are two Secondary riser configurations:
  - ο 4x8 Secondary Riser Kit provides 4 slots with PCIe Gen5 x8 on Slot5-8.
  - ο 2x16 Secondary Riser Kit provides 2 slots with PCIe Gen5 x16 on Slot6 & 8.

Secondary Riser 4x8					
Slots #	**Processor**	**Technology**	**Bus Width**	**Connector Width**	**Slot Form Factor**
5	CPU 2	PCIe 5.0	X8	X16	Full-height,full-length slot
6	CPU 2	PCIe 5.0	X8	X16	Full-height,full-length slot
7	CPU 2	PCIe 5.0	X8	X16	Full-height,full-length slot
8	CPU 2	PCIe 5.0	X8	X16	Full-height,full-length slot

Secondary Riser 2x16					
Slots #	**Processor**	**Technology**	**Bus Width**	**Connector Width**	**Slot Form Factor**
6	CPU 2	PCIe 5.0	X16	X16	Full-height,full-length slot
8	CPU 2	PCIe 5.0	X16	X16	Full-height,full-length slot

Tertiary Riser
Notes:
- Bus width indicates the number of physical electrical lanes running to the connector.
- Tertiary Riser Kit provides 2 slots with PCIe Gen5 x8 on Slot9 & 10.
- Two CPU 2 Flex I/O connectors will be occupied.
  - ο 2x8 Tertiary Riser Kit provides 2 slots with PCIe Gen5 x8 on Slot9 & 10.

Tertiary Riser 2x8					
Slots #	**Processor**	**Technology**	**Bus Width**	**Connector Width**	**Slot Form Factor**
9	CPU 2	PCIe 5.0	X8	X16	Half-height,Half-length slot
10	CPU 2	PCIe 5.0	X8	X16	Half-height,Half-length slot

Standard Features

Internal Storage Devices
- **Optical Drive**
  Available as an option (DVD-ROM or DVD-RW)
- **Hard Drives**
  None ship standard

Storage Controllers
NVMe Boot Devices
- HPE NS204i-u Gen11 NVMe Hot Plug Boot Optimized Storage Device

Essential RAID Controllers
- HPE Smart Array E208e-p SR Gen10 Controller

Tri-mode RAID Controllers
- HPE MR216i-o Gen11 x16 Lanes without Cache OCP SPDM Storage Controller
- HPE MR216i-p Gen11 x16 Lanes without Cache OCP SPDM Storage Controller
- HPE MR408i-o Gen11 x8 Lanes 4GB Cache OCP SPDM Storage Controller
- HPE MR416i-o Gen11 x16 Lanes 8GB Cache OCP SPDM Storage Controller
- HPE SR932i-p Gen11 x32 Lanes 8GB Wide Cache PCI SPDM Plug-in Storage Controller

Maximum Storage

Drive	Capacity	Configuration
Hot Plug LFF SAS HDD	240 TB	12 x20TB
Hot Plug LFF SATA HDD	240TB	12 x20TB
Hot Plug LFF SATA SSD	11.52 TB	12 x960GB
Hot Plug SFF SAS HDD	57.6 TB	24 x2.4TB
Hot Plug SFF SAS SSD	368.64 TB	24 x15.36TB
Hot Plug SFF SATA HDD	48 TB	24 x2TB
Hot Plug SFF SATA SSD	184.32 TB	24 x7.68TB
Hot Plug SFF NVMe PCIe SSD	368.64 TB	24 x15.36TB
Hot Plug NVMe M.2 SSD	480 GB	2 x480GB (With NS204i-u boot option with RAID1 protected)

Graphics

Integrated Video Standard
- Video modes up to 1920 x 1200@60Hz (32 bpp)
- 16MB Video Memory

HPE iLO 6 on system management memory
- 64 MB Flash
- 8 Gbit DDR 4 with ECC protection

Power Supply
- HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
  Notes: Available in 94%. Power Efficiency
- HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
  Notes: Available in 94%. Power Efficiency
- HPE 1000W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit
  Notes: Available in 96%. Power Efficiency
- HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit
  Notes:
    - Available in 94% Power Efficiency.

Standard Features

  – 200-240VAC power input only.

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 Gen11 Performance 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 (A0K02A). 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**

Interfaces

Serial	Optional, rear
Display Port	1 standard, front
VGA Port	1 VGA Port standard, rear
Network Ports	None. Choice of OCP or stand up card
HPE iLO Remote Management Network Port	1 Gb Dedicated, rear
Front iLO Service Port	1 standard, front
USB 3.2 Gen1	4 standard on all models: 1 front, 2 rear, 1 internal
USB 2.0	1 internal

Operating Systems and Virtualization Software Support for ProLiant Servers
- Windows Server 2019
- Windows Server 2022
- Red Hat Enterprise Linux (RHEL) 8.6 rebuild
- Red Hat Enterprise Linux (RHEL) 9.0 rebuild
- SUSE Linux Enterprise Server (SLES) 15 SP4
- VMware vSphere 7.0 U3 P04
- VMware vSphere 8.0
- Ubuntu 22.04
- Citrix Hypervisor Hypervisor 8.2
- Oracle Linux OL9

Notes: For more information on Hewlett Packard Enterprise Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server.
https://www.hpe.com/us/en/servers/server-operating-systems.html

HPE Server UEFI
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 Gen11 servers have a UEFI Class 2 implementation.
Notes: The UEFI System Utilities tool is analogous to the HPE ROM-Based Setup Utility (RBSU) of legacy BIOS. For more information, please visit **http://www.hpe.com/servers/uefi**.

Standard Features

UEFI enables numerous new capabilities specific to HPE ProLiant servers such as
- Secure Boot and Secure Start enabled for enhanced security
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.2 Gen1 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
- 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.

Industry Standard Compliance
- ACPI 6.1 Compliant
- PCIe 5.0 Compliant
- WOL Support
- Microsoft® Logo certifications
- Support for Microsoft Secure Code
- PXE Support
- VGA/Display Port
- USB 3.2 Gen1 Compliant
- USB 2.0 Compliant
- OCP 3.0 SFF NIC Support
- OCP 3.0 SFF Storage Support
- Embedded TPM Support
- Energy Star
- SMBIOS 3.1
- UEFI 2.7
- UEFI Class 3 (Unified Extensible Firmware Interface Forum)
- Redfish API
- IPMI 2.0
- Advanced Encryption Standard (AES)
- Triple Data Encryption Standard (3DES)
- SNMP v3

Standard Features

- TLS 1.2
- DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP)
- DMTF Redfish support for SecureBoot Key Management
- ACPI DSM Drive LED Management
- Memory Page Retire Support
- Retire old VMware Secure Boot Key
- MCTP over PCIe multi-segment (EDKII for GenoaPI 0.0.9.0, HPE under verifying0)
- Synergy: I3C Engine
- APML
- One Button Secure Erase Enhancements
- Active Directory v1.0
- ASHRAE A3/A4
  Notes: For additional technical thermal details regarding ambient temperatures, humidity and features support please visit:.

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).
Learn more at **http://www.hpe.com/servers/uefi**

Intelligent Provisioning
Hassle free server and OS provisioning for 1 or more servers with Intelligent Provisioning.
Learn more at **http://www.hpe.com/servers/intelligentprovisioning**

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**

HPE GreenLake for Compute Ops Management
HPE is intelligently transforming compute management with a completely new As a Service experience that delivers greater security, simplicity, and efficiency. Discover a completely modernized compute management experience delivered through HPE GreenLake that securely streamlines operations from edge-to-cloud, and automates key lifecycle tasks (onboard, update, manage and monitor HPE servers), bringing the agility and greater efficiencies to wherever compute devices reside via a unified single browser-based interface.

Compute Ops Management is built on a unique cloud-native architecture that abstracts, manages and controls HPE servers regardless of physical location. The management application resides in the HPE GreenLake cloud platform (access via **https://console.greenlake.hpe.com**) and leverages the HPE GreenLake architecture, security, and unified operations.

Each HPE ProLiant Gen11 rack, tower and micro server will include a 3-year subscription to HPE GreenLake for Compute Ops Management - Standard Tier. Upgrades to Standard Tier 5 Year term or to an Enhanced Tier, 3 or 5 Year term, subscription can be made at time of order. Upgrades to Enhanced tier or OneView can also be made at any time.

Standard Features

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
The Active System Health Viewer (AHSV) was deprecated as of March 2022. Users are now recommended to use the InfoSight (https://www.hpe.com/us/en/solutions/infosight.html) for Servers Portal for AHS viewing capabilities. In InfoSight for Servers portal, users will also be able to view hardware configuration details, firmware and driver information, warranty and support status of a server, wellness alerts, and create support cases for servers under a valid warranty or support contract.

HPE InfoSight provides the same security assurances as that of AHSV. Furthermore, InfoSight can be used as an AHSV replacement even if customers do not want to share AHSV logs and telemetry data on an ongoing basis.

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.html.**

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**

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 is an on premesis, multi-generational server monitoring and management solution. HPE OneView Standard can be used for inventory, health monitoring, alerting, and reporting without additional fees. Customers can upgrade their management experience with an HPE OneView Advanced license, all provided by the same tool. Learn more at
http://www.hpe.com/info/oneview.

Security
- UEFI Secure Boot and Secure Start support
- Immutable Silicon Root of Trust
- FIPS 140-3 validation (iLO 6 certification in progress)
- Common Criteria certification (iLO 6 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)
- Tamper-free updates – components digitally signed and verified
- Secure Recovery – recover critical firmware to known good state on detection of compromised firmware

Standard Features

- Ability to rollback firmware
- Secure erase of NAND
- TPM (Trusted Platform Module) 2.0
- Front bezel key-lock feature – standard, available in both Tower and Rack models
- Padlock slot, standard
- Kensington Lock slot, standard
- Chassis Intrusion detection option

Warranty

This product is covered by a global limited warranty and supported by HPE Services and a worldwide network of HPE 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 Pointnext 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.

Notes: 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. 3) Non CSR parts must be serviced by a trained authorized service engineer. Additional information regarding worldwide limited warranty and technical support is available at: **http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/**.

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**.

Accelerator and GPGPU Information
Hewlett Packard Enterprise supports various accelerators on select HPE Proliant servers to support different workloads. The accelerators enable seamless integration of GPU computing with HPE ProLiant servers for high-performance computing, large data center graphics, deep learning and virtual desktop deployments. These accelerators deliver all of the standard benefits of GPU computing while enabling maximum reliability and tight integration with system monitoring and management tools such as HPE Insight Cluster Management Utility.

Rack and Power Infrastructure
The story may end with servers, but it starts with the foundation that makes compute go – and business grow. We've 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've 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**.

Optional Features

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 Pointnext - Service and Support
HPE Pointnext Services No matter where you are in your digital transformation journey, you can count on HPE Pointnext Services to provide the expertise you need, when and where you need it.

Advisory and Professional Services
Advisory Services our Digital Next Advisory approach can help you identify, prioritize, and implement the right transformation initiatives to create new edge experiences, get real-time insights from all your data, and modernize your IT to enable new opportunities.

Operational Services
Operational Services take your IT operations to the next level with expertise and tools that can help save your staff time, manage complexity, and identify new ways to drive efficiency and effectiveness in your IT.

Consume IT on your terms
HPE GreenLake 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 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

Managed services to run your IT operations
HPE GreenLake Management Services provide 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.

Recommended Services
HPE Pointnext Tech Care
HPE Pointnext Tech Care is the new operational service experience for HPE products. Tech Care 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 Pointnext Tech Care has been reimagined from the ground up to support a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Pointnext Tech Care 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 Pointnext Complete Care
HPE Pointnext Complete Care is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimizing your entire IT environment and achieving agreed upon IT outcomes and business goals through a personalized and customer-centric experience. All delivered by an assigned team of HPE Pointnext Services experts. HPE Pointnext Complete Care 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 Lifecycle Services
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:

Service and Support

- Installation 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 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.
- HPE Implementation Assistance Service: 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.
    - For a list of the most frequently purchased services using service credits, see the **Universal Service Credits Menu**

Other related Services

HPE Education Services
Provides comprehensive training designed to expand the skills of your IT staff and keep them up to speed with the latest technologies.

Defective Media Retention
An option available with HPE Pointnext Complete Care and HPE Pointnext Tech Care 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 support options.

AI Powered and Digitally Enabled Support Experience
Achieve faster time to resolution with access to product-specific resources and expertise through a brand-new digital and data driven customer experience.

Sign into the new 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 a new intelligent virtual agent with seamless transition when needed to a live support agent.
Learn more **https://support.hpe.com/hpesc/public/home/signin**

HPE Support 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 HPE Support Services at **https://ssc.hpe.com/portal/site/ssc/**

Parts and Materials
Hewlett Packard Enterprise 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 QuickSpecs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.

Configuration Information

Smart Templates from HPE
HPE is releasing new Smart Template technology in the One Config Advanced (OCA) configurator. These Templates represent the CTO equivalents of the top-selling BTO configurations. They are intended to provide simple starting points to assist you in easily creating and customizing your desired Server solutions. HPE Servers that have Platform Templates, developed by HPE Product Managers, will have a separate tab in the HPE OCA configurator.

Workload Solutions Templates from HPE
The Workload Solutions Templates build on the Smart Templates technology to easily develop working configurations of the most compelling Workload Solutions. The templates complement the Reference Builds developed by HPE. Workload Solutions templates preconfigure some of the key architecture decisions and make it easier for Sellers to get started and complete a differentiated server solution for your customer's specific workload.

Mainstream SKUs
HPE launched the Mainstream SKU initiative as a market-driven approach to Demand Steering. It is a simplified portfolio of our top selling options that meet the current and future market trends. HPE has committed to provide a more predictable and faster experience for these options. Mainstream SKUs enjoy higher safety stock levels and have higher fulfilment service levels than non-Mainstream SKUs. Mainstream orders are fulfilled +30% faster than non-Mainstream orders, have fewer shortages and better recovery dates. This platform has Mainstream SKUs in the options portfolio, and is eligible for the improved Mainstream experience. Mainstream SKUs are designated with a Mainstream symbol in our configurators.

Mainstream Configurations
HPE is using the new Smart Templates technology to present Mainstream configurations. All the options in a Mainstream configuration are pre-selected Mainstream SKUs to optimize the performance, predictability and fulfilment experience. Check the Template section in our configurators for eligible Mainstream configurations.

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.
- Factory Integrated Models must start with a CTO Server.
- FIO indicates that this option is only available as a factory integratable option.
- All Factory Integrated Models will be populated with sufficient hard drive blanks based on the number of initial hard drives ordered with the server.
- 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)

CTO Server	HPE ML350 Gen11 LFF CTO Server	HPE ML350 Gen11 SFF CTO Server
SKU Number	P48404-B21	P48405-B21
Processor Sockets	2 Sockets available	
Processor	Intel Fourth Generation Xeon® Scalable Processors	
DIMM Slots	32 DIMM slots available*	
Storage Controller	Embedded controller with 2 SlimSAS ports, Choice of HPE OCP-type RAID (OROC) and/or PCIe Standup controller card (s)	
PCIe	4 PCIe Gen5 slots (x8, x8, x8, x8) as standard **Notes:** PCIe slots 5 – 10 require the second processor to enable.	
Drive Cage - included	4 LFF SAS/SATA Drive Cage	8 SFF SAS/SATA/x1 NVMe Drive Cage

Configuration Information

CTO Server	HPE ML350 Gen11 LFF CTO Server	HPE ML350 Gen11 SFF CTO Server
Additional drive cages	Optional 4 LFF SAS/SATAHDD Cage kit, Up to 3 in total **Notes:** For mixed SFF and LFF HDD configuration, please select LFF CTO Server as base configuration.	Optional 8 SFF SAS/SATA/x1 NVMe HDD Cage kit, Up to 3 in total
8 SFF x4 NVMe drive cage	Not available	Optional, Up to 1 **Notes:** Default 8 SFF drive cage need to be removed.
ODD	Optional, Up to 1	
Half-Height RDX	Optional, Up to 1	Not available
Megacell Battery	Optional	
Network Controller	Choice of HPE OCP-type networking adapter and/or PCIe Standup controller card (s). Default selected with 4x1GbE Broadcom BCM5719 Ethernet 1Gb 4-port BASE-T OCP3 Adapter for HPE	
Redundant Fan Kit	Optional, 3 fans as standard	
Power Supply	HPE Flex Slot Hot Plug Power Supply Kit, up to 2	
Management	HPE iLO with Intelligent Provisioning (standard), iLO Advances and OneView (optional), HPE GreenLake for Compute Ops Management (subscription included)	
USB	5x 3.2 Gen1/2.0 USB ports, Plus front iLO Service Port	
Tower-to-Rack conversion kit	Optional **Notes:** Tower to Rack kit is not factory integratable option and only can be shipped with standalone package.	

Notes:

- * 32 DIMM slots require selection of 2 processors.
- Internal RDX can only be selected with LFF chassis and will occupied one drive cage space.
- 8 SFF x4 NVMe drive cage can only be selected with SFF chassis and default 8SFF drive cage will be removed.
- To get advanced cooling in richer configurations and/or under certain ambient environmental conditions, the additional Fan kits: Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21) may require.
- Second CPU Fan Kit (P47902-B21) is required when following options is selected: Second processor, HPE NS204i-u Gen11 Ht Plg Boot Opt Dev(P48183-B21), Tertiary riser kit (P49693-B21).
- Both Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21) are required with following conditions:
- Redundant Fan feature is required, 300W~350W TDP processor is selected.
- Mixed LFF and SFF Drive cages can be supported in one system. Please select the LFF CTO Server (P48404-B21) as the base configuration to start with.
- Refer to HPE Power Advisor Tool to review the power requirement for your selected configuration and determine what power supply module(s) to select.

Configuration Information

Step 2: Choose Required Options (only one of the following unless otherwise noted)

Please select one or two matching processors.

For example: for a single Xeon-Platinum 8452Y processor configuration select 1x P49616-B21. If dual Xeon-Platinum 8452Y processor configuration, select 2x P49616-B21

Notes:

— Mixing of 2 different processor models is not supported.

— Processor kits don't include heat sink and fans.

— CTO server includes 3 standard fans. 2 processors configuration requires 4 fans, either standard or high performance (dependent on processor model).

— Processors with TDP equal to or greater than 195W require Performance Heatsink (P47224-B21).

— Processors with TDP equal to or greater than 300W require both Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

— DDR5 memory speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

Step 2a: Choose Processors

Processor Option Kits – Intel Fourth Generation Xeon® Scalable Processors

Notes

— All SKUs below ship with processor only. Adequate fan and heatsink kits (standard or performance) must be selected.

— 4800 MT/S maximum memory speed unless otherwise noted.

— 128GB SGX Enclave unless otherwise noted.

Intel Xeon-Gold Processors

Intel Xeon-Gold 6430 2.1GHz 32-core 270W Processor for HPE	P49614-B21

Notes

— Requires Performance Heatsink (P47224-B21),

— 4400 MT/s maximum memory speed.

Intel Xeon-Gold 6414U 2.0GHz 32-core 250W Processor for HPE	P49619-B21

Notes: Requires Performance Heatsink (P47224-B21),

Intel Xeon-Gold 6454S 2.2GHz 32-core 270W Processor for HPE	P49654-B21

Notes: Requires Performance Heatsink (P47224-B21),

Intel Xeon-Platinum Processors

Intel Xeon-Platinum 8460Y+ 2.0GHz 40-core 300W Processor for HPE	P49604-B21

Notes: Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

Intel Xeon-Platinum 8468 2.1GHz 48-core 350W Processor for HPE	P49605-B21

Notes:

— Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

— 512GB SGX Enclave.

Intel Xeon-Platinum 8470 2.0GHz 52-core 350W Processor for HPE	P49606-B21

Notes:

— Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

— 512GB SGX Enclave.

Configuration Information

Intel Xeon-Platinum 8480+ 2.0GHz 56-core 350W Processor for HPE	P49607-B21

Notes:
- Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).
- 512GB SGX Enclave.

Intel Xeon-Platinum 8452Y 2.0GHz 36-core 300W Processor for HPE	P49616-B21

Notes: Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

Intel Xeon-Platinum 8470N 1.7GHz 52-core 300W Processor for HPE	P49649-B21

Notes: Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

Intel Xeon-Platinum 8468V 2.4GHz 48-core 330W Processor for HPE	P49631-B21

Notes: Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).

Intel Xeon-Platinum 8458P 2.7GHz 44-core 350W Processor for HPE	P49632-B21

Notes:
- Requires Performance Heatsink (P47224-B21), Redundant Fan Kit (P47219-B21) and Second CPU Fan Kit (P47902-B21).
- 512GB SGX Enclave.

Step 2b: Choose Memory Options

Please select one or more memory from below.

For new Gen11 memory population rule whitepaper and optimal memory performance guidelines, please go to:
https://www.hpe.com/docs/memory-population-rules

For Gen11 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.
- Quantity of memory DIMMs selected per socket must be 1, 2, 4, 6, 8, 12 or 16.
- For additional information, please see the **HPE DDR5 SmartMemory QuickSpecs**.
- For General Server Memory and Persistent Memory Population Rules and Guidelines, see details here:
  http://www.hpe.com/docs/memory-population-rules
- HPE Server Memory compatibility for a specific server platform may vary or be limited within a server platform depending upon the specific configuration being requested. Because each server environment and requirements can vary, memory compatibility is based not only upon the server family, but may also be affected by the amount and type of additional hardware options installed within a specific server configuration. For this reason, some HPE memory DIMMs may be qualified for an HPE server model or family and yet occasionally not be supported with some configurations within that server family.

Memory – for the Fourth Generation Intel Xeon® Scalable Processors

Description

HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43322-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43328-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43331-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43334-B21
HPE 256GB (1x256GB) Octal Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43337-B21

Notes: Support limited to 25°C maximum inlet temperature for 256GB memory.

Configuration Information

Step 2c: Choose Power Supplies

Notes:
- Mixing of 2 different power supplies is NOT supported.
- Selection of two HPE Flex Slot power supplies provide 1+1 power redundancy.
- To review the power requirements for your selected configuration, please use the **HPE Power Advisor Tool**.

Power Supplies

HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865408-B21

Notes: Support limited to single 125W Processor.

HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	P38995-B21
HPE 1000W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit	P03178-B21
HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	P38997-B21

Notes: Only supports high line voltage (200 VAC to 240 VAC).

Step 3: Choose Additional Factory Integratable Options

One of the following from each list may be selected if desired at time of factory integration.

HPE Unique Options

HPE ProLiant ML350 Gen11 8SFF x1 U.3 Tri-Mode Drive Cage Kit	P47217-B21

Notes: Add additional 8 SFF hot-plug hard drive cage, allowing for up to 24 SFF drive support (8+8+8).

HPE ProLiant ML350 Gen11 4LFF SAS/SATA Basic Drive Cage Kit	P47216-B21

Notes: Add additional 4 LFF hot-plug hard drive cage, allowing for up to 12 LFF drive support (4+4+4).

HPE ProLiant ML350 Gen11 8SFF x4 U.3 Tri-Mode FIO Drive Cage Kit	P47218-B21

Notes:
- When this drive cage selected, default 8SFF Tri-Mode Drive Cage will be removed and no other drive cage can be selected.
- This drive cage kit supports two connections types, Direct Attach and Tri-Mode controller.
- x4 NVMe Direct Attach FIO Cable Kit (P48399-B21) are required for Direct Attach mode, otherwise HPE SR932i-p Gen11 Controller (P47184-B21) and x4 Tri-Mode FIO Cable Kit (P47234-B21) are required.

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

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 HPE approved configurator. Contact your local sales representative for additional information.
Notes: The **User Guide (UG)** can help to explain the cable routing for each option.

Software as a Service Management

HPE GreenLake for Compute Ops Management
Notes: For customers purchasing HPE GreenLake for Compute Ops Management, without a hardware purchase or a BTO purchase, use base SKU within ASQ order.

For more information, visit the HPE GreenLake for Compute Ops Management
QuickSpecs: **https://www.hpe.com/psnow/doc/a50004263enw**

Supported Servers – CTO only. No OEM. – Complete list can be found here: Latest Supported Server
List: **https://www.hpe.com/info/com-supported-servers**

Base SKU

HPE GreenLake for Compute Ops Management Base SaaS	R6Z73AAE
HPE GreenLake for Compute Ops Management Standard 3-year Upfront ProLiant SaaS	R6Z89AAE

Upgrade SKU

HPE GreenLake for Compute Ops Management Standard 1-year Upfront ProLiant SaaS	R6Z88AAE
HPE GreenLake for Compute Ops Management Standard 5-year Upfront ProLiant SaaS	R6Z90AAE
HPE GreenLake for Compute Ops Management Standard 1-year Monthly ProLiant SaaS	R6Z91AAE
HPE GreenLake for Compute Ops Management Standard 3-year Monthly ProLiant SaaS	R6Z92AAE
HPE GreenLake for Compute Ops Management Standard 5-year Monthly ProLiant SaaS	R6Z93AAE
HPE GreenLake for Compute Ops Management Standard 1-year Quarterly ProLiant SaaS	R6Z94AAE
HPE GreenLake for Compute Ops Management Standard 3-year Quarterly ProLiant SaaS	R6Z95AAE
HPE GreenLake for Compute Ops Management Standard 5-year Quarterly ProLiant SaaS	R6Z96AAE
HPE GreenLake for Compute Ops Management Standard 3-year Annual ProLiant SaaS	R6Z97AAE
HPE GreenLake for Compute Ops Management Standard 5-year Annual ProLiant SaaS	R6Z98AAE
HPE GreenLake for Compute Ops Management Enhanced 1-year Upfront ProLiant SaaS	R7A10AAE
HPE GreenLake for Compute Ops Management Enhanced 3-year Upfront ProLiant SaaS	R7A11AAE
HPE GreenLake for Compute Ops Management Enhanced 5-year Upfront ProLiant SaaS	R7A12AAE
HPE GreenLake for Compute Ops Management Enhanced 1-year Monthly ProLiant SaaS	R7A13AAE
HPE GreenLake for Compute Ops Management Enhanced 3-year Monthly ProLiant SaaS	R7A14AAE
HPE GreenLake for Compute Ops Management Enhanced 5-year Monthly ProLiant SaaS	R7A15AAE
HPE GreenLake for Compute Ops Management Enhanced 1-year Quarterly ProLiant SaaS	R7A16AAE
HPE GreenLake for Compute Ops Management Enhanced 3-year Quarterly ProLiant SaaS	R7A17AAE
HPE GreenLake for Compute Ops Management Enhanced 5-year Quarterly ProLiant SaaS	R7A18AAE
HPE GreenLake for Compute Ops Management Enhanced 3-year Annual ProLiant SaaS	R7A19AAE
HPE GreenLake for Compute Ops Management Enhanced 5-year Annual ProLiant SaaS	R7A20AAE

Core Options

HPE OneView

OV Advanced Flex E-LTU	E5Y35AAE
OV Adv w/o iLO Adv Flex E-LTU	P8B26AAE

Notes: For customers purchasing HPE GreenLake for Compute Ops Management, without a hardware purchase or a BTO purchase, use this base SKU within ASQ order:

HPE GreenLake for Compute Ops Management Base	R6Z73AAE

For more information, visit the HPE GreenLake for Compute Ops Management QuickSpecs:
https://www.hpe.com/psnow/doc/a50004263enw
Supported Servers – CTO only. No OEM. – Complete list can be found here: Latest Supported Server List:
https://www.hpe.com/info/com-supported-servers

HPE Unique Options
Risers

HPE ProLiant ML350 Gen11 2x16 Primary FIO Riser Kit	P48406-B21

Notes: When this Riser Kit is selected, default 4x8 Primary Riser will be removed.

HPE ProLiant ML350 Gen11 4x8 Secondary Riser Kit	P48407-B21

Notes: When this Riser Kit is selected, Second processor is required.

HPE ProLiant ML350 Gen11 2x16 Secondary Riser Kit	P47238-B21

Notes: When this Riser Kit is selected, Second processor is required.

HPE ProLiant ML350 Gen11 2x8 Tertiary Riser Kit	P49693-B21

Notes: When this Riser Kit is selected, Second processor is required and limited to support NIC adapter installation with two CPU 2 Flex I/O connectors.

Cooling Options

HPE ProLiant ML350 Gen11 Standard Heat Sink Kit	P47223-B21

Notes: Processors with TDP less than 195W require Standard Heat Sink.

HPE ProLiant ML350 Gen11 Performance Heat Sink Kit	P47224-B21

Notes: Processors with TDP equal to or greater than 195W require Performance Heat Sink.

HPE ProLiant ML350 Gen11 Second CPU Fan Kit	P47902-B21

Notes: When either Second processor, NS204i-u or Tertiary Riser is selected, this Fan Kit is required.

HPE ProLiant ML350 Gen11 Redundant Fan Kit	P47219-B21

Notes: Processors with TDP equal to or greater than 300W require this Fan Kit.
When this Fan Kit is selected, Second CPU Fan Kit (P47902-B21) need be selected together.

HPE Boot Controllers

HPE NS204i-u Gen11 NVMe Hot Plug Boot Optimized Storage Device	P48183-B21

Notes:

– When NS204i-u is selected, Second CPU Fan Kit (P47902-B21) and ML350 Gen11 NS204i-u Enablement Kit (P48403-B21) is required.
– Support limited to 25°C maximum inlet temperature with 3 SFF/LFF Drive Cage selected without Redundant Fan Kit (P47219-B21).
– System fans may oprate at higher speed to maintain optimum system cooling condition while NS204i-u is installed.

HPE ProLiant ML350 Gen11 NS204i-u Enablement Kit	P48403-B21

**Notes:** When NS204i-u is selected, this Enablement Kit is required.

Core Options

HPE Optical Drives

HPE 9.5mm SATA DVD-ROM Optical Drive	726536-B21

Notes: When this ODD selected, ODD cable Kit (P56608-B21) is required.

HPE 9.5mm SATA DVD-RW Optical Drive	726537-B21

Notes: When this ODD selected, ODD cable Kit (P56608-B21) is required.

HPE Mobile USB DVD-RW Drive	701498-B21
HPE ProLiant ML350 Gen11 Optical Disk Drive Cable Kit	P56608-B21

Notes: When internal ODD selected, this ODD cable Kit is required.

HPE Storage Controllers

Storage Controllers
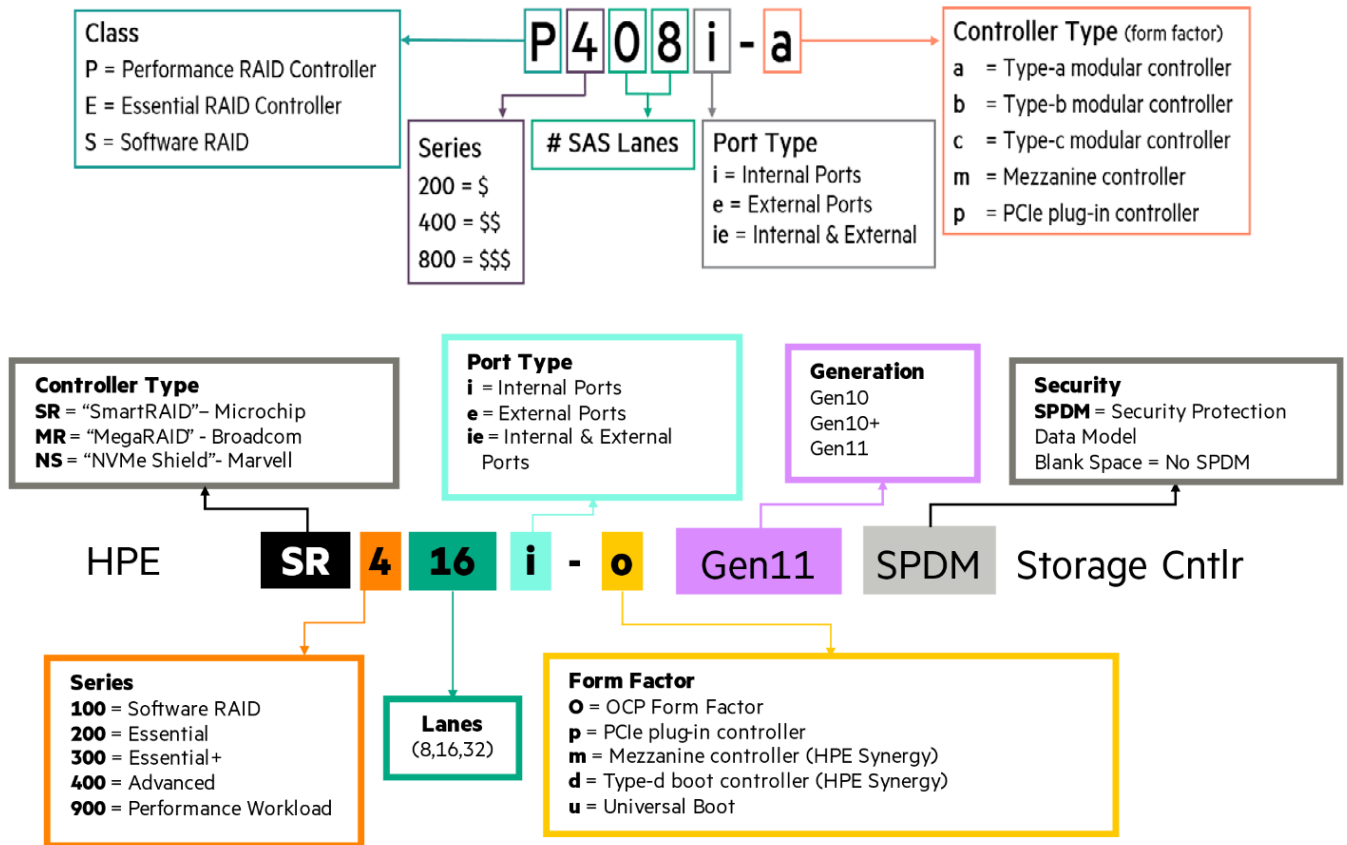
Notes:
- When selecting SR RAID controllers for external storage (E208e, 804398-B21) and MR RAID controllers for internal storage(MR216i/MR416i/MR408i) in the order, please be aware these two products use different RAID configuration tools.
- Not supporting mixing of MR (MegaRAID) series internal controllers and SR (SmartRAID) series internal Controllers
- OCP-type RAID (OROC) controller is only supported on OCP 1 slot.
- OCP 1 enablement kit is not required for listed ORCO controlers below.
- For more information on the HPE Gen11 Storage Controller, please refer to:
  HPE Compute MR Gen11 Controllers Quick Spec
  HPE Compute SR Gen11 Controllers Quick Spec

Core Options

Essential RAID Controllers

HPE Smart Array E208e-p SR Gen10 Controller   804398-B21

Notes: This controller supports up to 8 SAS/SATA Drives (external)
For more information on the HPE Smart Array E208i-p SR Gen10 Controller, please refer to the **QuickSpecs**

Tri-mode RAID Controllers

HPE MR216i-o Gen11 x16 Lanes without Cache OCP SPDM Storage Controller   P47789-B21

Notes:
− Does not occupy a PCIe expansion slot.
− This controller supports up to 16 SAS/SATA/NVMe Drives with RAID 0/1/10.

HPE MR216i-p Gen11 x16 Lanes without Cache OCP SPDM Storage Controller   P47785-B21

Notes: This controller supports up to 16 SAS/SATA/NVMe Drives with RAID 0/1/10.

HPE MR408i-o Gen11 x8 Lanes 4GB Cache OCP SPDM Storage Controller   P58335-B21

Notes:
− Does not occupy a PCIe expansion slot.
− This controller supports up to 8 SAS/SATA/NVMe Drives
− HPE 96W Smart Storage Battery 260mm Cbl (P01367-B21) OR HPE Smart Hybrid Capacitor w/ 260mm Cbl (P02381-B21) must be selected with this controller.

HPE MR416i-o Gen11 x16 Lanes 8GB Cache OCP SPDM Storage Controller   P47781-B21

Notes:
− Does not occupy a PCIe expansion slot.
− This controller supports up to 16 SAS/SATA/NVMe Drives
− HPE 96W Smart Storage Battery 260mm Cbl (P01367-B21) OR HPE Smart Hybrid Capacitor w/ 260mm Cbl (P02381-B21) must be selected with this controller.

HPE MR416i-p Gen11 x16 Lanes 8GB Cache PCI SPDM Plug-in Storage Controller   P47777-B21

Notes:
− This controller supports up to 16 SAS/SATA/NVMe Drives
− HPE 96W Smart Storage Battery 260mm Cbl (P01367-B21) OR HPE Smart Hybrid Capacitor w/ 260mm Cbl (P02381-B21) must be selected with this controller.

HPE SR932i-p Gen11 x32 Lanes 8GB Wide Cache PCI SPDM Plug-in Storage Controller   P47184-B21

Notes:
− This controller supports up to 32 SAS/SATA/NVMe Drives
− HPE 96W Smart Storage Battery 260mm Cbl (P01367-B21) OR HPE Smart Hybrid Capacitor w/ 260mm Cbl (P02381-B21) must be selected with this controller.

Controller Battery Cable Kits

HPE 96W Smart Storage Lithium-ion Battery with 260mm Cable Kit   P01367-B21
HPE Smart Storage Hybrid Capacitor with 260mm Cable Kit   P02381-B21

Notes: The two 260mm cable kit can't be selected together.

HPE ProLiant ML350/ML110 Gen11 Smart Storage Battery Cable Kit   P58199-B21

Notes: This cable kit is required when one the two 260mm cable kits (P02377-B21, P01366-B21) is selected.

Core Options

HPE Drives

Description

Enterprise - 12G SAS - SFF Drives

HPE 300GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	P28028-B21
HPE 300GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	P40430-B21
HPE 600GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty Multi Vendor HDD	P53560-B21
HPE 600GB SAS 12G Mission Critical 10K SFF BC 3-year Warranty Multi Vendor HDD	P53561-B21
HPE 900GB SAS 12G Mission Critical 15K SFF BC 3-year Warranty HDD	P40432-B21
HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty HDD	P28586-B21
HPE 1.8TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e Multi Vendor HDD	P53562-B21
HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e HDD	P28352-B21

Midline - 12G SAS - SFF Drives

HPE 1TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty HDD	P53563-B21
HPE 2TB SAS 12G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	P28505-B21

Midline - 12G SAS - LFF Drives

HPE 2TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty Multi Vendor HDD	833926-B21
HPE 4TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty Multi Vendor HDD	833928-B21
HPE 6TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty 512e Multi Vendor HDD	861746-B21
HPE 8TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty 512e Multi Vendor HDD	834031-B21
HPE 10TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty 512e ISE Multi Vendor HDD	P53556-B21
HPE 12TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty Helium 512e Multi Vendor HDD	881781-B21
HPE 14TB SAS 12G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	P09155-B21
HPE 16TB SAS 12G Business Critical 7.2K LFF (3.5in) LP 1yr Wty 512e ISE HDD	P23608-B21
HPE 18TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty 512e ISE HDD	P37669-B21
HPE 20TB SAS 12G Business Critical 7.2K LFF LP 1-year Warranty Helium 512e ISE Multi Vendor HDD	P53553-B21

Midline - 6G SATA - SFF Drives

HPE 1TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty HDD	P28610-B21
HPE 2TB SATA 6G Business Critical 7.2K SFF BC 1-year Warranty 512e HDD	P28500-B21

Midline - 6G SATA - LFF Drives

HPE 2TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty Multi Vendor HDD	861686-B21
HPE 2TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty Multi Vendor HDD	P53554-B21
HPE 4TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty Multi Vendor HDD	861681-B21
HPE 6TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty 512e Multi Vendor HDD	861683-B21
HPE 8TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty 512e Multi Vendor HDD	861742-B21
HPE 10TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty 512e ISE Multi Vendor HDD	834028-B21
HPE 12TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty Helium 512e Multi Vendor HDD	P53557-B21
HPE 14TB SATA 6G Midline 7.2K LFF (3.5in) LP 1yr Wty Helium 512e Digitally Signed Firmware HDD	881787-B21
HPE 16TB SATA 6G Business Critical 7.2K LFF (3.5in) LP 1yr Wty 512e ISE HDD	P09165-B21
HPE 18TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty 512e ISE HDD	P23449-B21
HPE 20TB SATA 6G Business Critical 7.2K LFF LP 1-year Warranty Helium 512e ISE Multi Vendor HDD	P37678-B21

Core Options

SED (Self-Encryption Drive)

HPE 1.2TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty Self-encrypting HDD   P28622-B21
HPE 2.4TB SAS 12G Mission Critical 10K SFF BC 3-year Warranty 512e Self-encrypting HDD   P28618-B21

Notes:

– Requirements for MR Tri-mode controller SED support

    o TPM is not required for Local Key Management as key is stored in controller

    o iLO Advanced is required for Remote Key Management. Key is stored in remote key manager. (Ex. ESKM)

SSD Selection

Description

Read Intensive - 12G/24G SAS - SFF - Solid State Drives

HPE 960GB SAS 12G Read Intensive SFF BC Value SAS Multi Vendor SSD   P40506-B21
HPE 1.92TB SAS 12G Read Intensive SFF BC Value SAS Multi Vendor SSD   P40507-B21
HPE 3.84TB SAS 12G Read Intensive SFF BC Value SAS Multi Vendor SSD   P40508-B21
HPE 7.68TB SAS 12G Read Intensive SFF BC Value SAS Multi Vendor SSD   P40509-B21
HPE 960GB SAS 24G Read Intensive SFF BC Multi Vendor SSD   P49029-B21
HPE 1.92TB SAS 24G Read Intensive SFF BC Multi Vendor SSD   P49031-B21
HPE 3.84TB SAS 24G Read Intensive SFF BC Multi Vendor SSD   P49035-B21
HPE 7.68TB SAS 24G Read Intensive SFF BC Multi Vendor SSD   P49041-B21
HPE 15.36TB SAS 24G Read Intensive SFF BC Multi Vendor SSD   P49045-B21

Mixed Use - 12G/24G SAS - SFF - Solid State Drives

HPE 960GB SAS 12G Mixed Use SFF BC Value SAS Multi Vendor SSD   P40510-B21
HPE 1.92TB SAS 12G Mixed Use SFF BC Value SAS Multi Vendor SSD   P40511-B21
HPE 3.84TB SAS 12G Mixed Use SFF BC Value SAS Multi Vendor SSD   P40512-B21
HPE 800GB SAS 24G Mixed Use SFF BC Multi Vendor SSD   P49047-B21
HPE 1.6TB SAS 24G Mixed Use SFF BC Multi Vendor SSD   P49049-B21
HPE 3.2TB SAS 24G Mixed Use SFF BC Multi Vendor SSD   P49053-B21
HPE 6.4TB SAS 24G Mixed Use SFF BC Multi Vendor SSD   P49057-B21

Mixed Use - LFF- Solid State Drives

HPE 960GB SAS 12G Mixed Use LFF LPC Value SAS Multi Vendor SSD   P37009-B21

Read Intensive - LFF- Solid State Drives

HPE 7.68TB SAS 24G Read Intensive LFF LPC Multi Vendor SSD   P49040-B21

Notes: ML350 Gen11 LFF backplane only supports up to 12G.

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

HPE 480GB SATA 6G Mixed Use SFF BC S4620 SSD   P47324-B21
HPE 3.84TB SATA 6G Mixed Use SFF BC S4620 SSD   P47327-B21
HPE 480GB SATA 6G Mixed Use SFF BC Multi Vendor SSD   P40502-B21
HPE 960GB SATA 6G Mixed Use SFF BC Multi Vendor SSD   P40503-B21
HPE 1.92TB SATA 6G Mixed Use SFF BC Multi Vendor SSD   P40504-B21
HPE 3.84TB SATA 6G Mixed Use SFF BC Multi Vendor SSD   P40505-B21
HPE 480GB SATA 6G Mixed Use SFF BC PM897 SSD   P44011-B21
HPE 960GB SATA 6G Mixed Use SFF BC PM897 SSD   P44012-B21
HPE 1.92TB SATA 6G Mixed Use SFF BC PM897 SSD   P44013-B21

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

HPE 1.92TB SATA 6G Read Intensive SFF BC S4520 SSD   P47320-B21
HPE 3.84TB SATA 6G Read Intensive SFF BC S4520 SSD   P47322-B21
HPE 240GB SATA 6G Read Intensive SFF BC Multi Vendor SSD   P40496-B21

Core Options

HPE 480GB SATA 6G Read Intensive SFF BC Multi Vendor SSD	P40497-B21
HPE 960GB SATA 6G Read Intensive SFF BC Multi Vendor SSD	P40498-B21
HPE 1.92TB SATA 6G Read Intensive SFF BC Multi Vendor SSD	P40499-B21
HPE 3.84TB SATA 6G Read Intensive SFF BC Multi Vendor SSD	P40500-B21
HPE 7.68TB SATA 6G Read Intensive SFF BC Multi Vendor SSD	P40501-B21
HPE 480GB SATA 6G Read Intensive SFF BC PM893 SSD	P44007-B21
HPE 960GB SATA 6G Read Intensive SFF BC PM893 SSD	P44008-B21
HPE 1.92TB SATA 6G Read Intensive SFF BC PM893 SSD	P44009-B21
HPE 3.84TB SATA 6G Read Intensive SFF BC PM893 SSD	P44010-B21

Read Intensive – 6G SATA - LFF – Solid State Drives

HPE 960GB SATA 6G Read Intensive LFF LPC Multi Vendor SSD	P47808-B21

Mixed Use - NVMe - SFF - Solid State Drives

HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD	P50227-B21
HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD	P50230-B21
HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD	P50233-B21
HPE 800GB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD	P47837-B21
HPE 1.6TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD	P47838-B21
HPE 3.2TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD	P47839-B21
HPE 6.4TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD	P47840-B21

Read Intensive – NVMe - SFF - Solid State Drives

HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD	P50216-B21
HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD	P50219-B21
HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD	P50222-B21
HPE 15.36TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD	P50224-B21
HPE 960GB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD	P47844-B21
HPE 1.9TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD	P47845-B21
HPE 3.84TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD	P47846-B21
HPE 7.68TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD	P47847-B21

Notes:

− Can only be selected with U.3 backplane/cage.
− For controller attached:
   o Requires Tri-Mode controllers.
   o Local Key Management handled by controller.
− For direct attach:
   o Can only support with x4 U.3 backplane
− iLO Advanced required for SED connectivity into customer's Remote Key Management environment.
− When used to run high-performance workloads, NVMe SSDs can cause the fans to operate at high speeds to maintain optimum system cooling.
− HPE has qualified the NVMe drive portfolio using the Operating System inbox drivers, full detail on the **HPE Solid State Drive QuickSpecs.**

Core Options

HPE Networking
Notes:
- Maximum 2 OCP adapters are supported, Networking OCP adapter takes OCP 2 slot by default.
- WOL and shared NIC function are only supported in OCP 2 slot.
- OCP2 Enablement Kit is required when install in OCP 2 slot.
- OCP1 slot provides x8 bandwidth and OCP1 Enablement Kit is not required when installed in OCP 1 slot unless otherwise notice.
- High performance networking cards equal or greater than 100Gb that may cause the fans to operate at higher speeds to maintain optimum system cooling when system at idle status.
- 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 QuickSpecs for Technical Specifications and additional information: **https://h20195.www2.hpe.com/v2/getpdf.aspx/A00002507ENW**.

PCIe Adapters
1 Gigabit Ethernet adapters
Broadcom BCM5719 Ethernet 1Gb 4-port BASE-T Adapter for HPE	P51178-B21
Intel I350-T4 Ethernet 1Gb 4-port BASE-T Adapter for HPE	P21106-B21

10 Gigabit Ethernet adapters
Broadcom BCM57416 Ethernet 10Gb 2-port BASE-T Adapter for HPE	P26253-B21
Broadcom BCM57412 Ethernet 10Gb 2-port SFP+ Adapter for HPE	P26259-B21

10/25 Gigabit Ethernet adapters
Broadcom BCM57414 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE	P26262-B21
Broadcom BCM57504 Ethernet 10/25Gb 4-port SFP28 Adapter for HPE	P26264-B21
Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE	P08443-B21
Mellanox MCX631102AS-ADAT Ethernet 10/25Gb 2-port SFP28 Adapter for HPE	P42044-B21
Intel E810-XXVDA4 Ethernet 10/25Gb 4-port SFP28 Adapter for HPE	P08458-B21

100 Gigabit Ethernet adapters
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 Adapter for HPE	P21112-B21
HPE NV60100M 100Gb 2-port Storage Offload Adapter	R8M41A

OCP Adapter
1 Gigabit Ethernet OCP adapters
Broadcom BCM5719 Ethernet 1Gb 4-port BASE-T OCP3 Adapter for HPE	P51181-B21
Intel I350-T4 Ethernet 1Gb 4-port BASE-T OCP3 Adapter for HPE	P08449-B21

10 Gigabit Ethernet OCP Adapters
Broadcom BCM57412 Ethernet 10Gb 2-port SFP+ OCP3 Adapter for HPE	P26256-B21
Broadcom BCM57416 Ethernet 10Gb 2-port BASE-T OCP3 Adapter for HPE	P10097-B21

10/25 Gigabit Ethernet OCP adapters
Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE	P10106-B21
Mellanox MCX631432AS-ADAI Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE	P42041-B21
Broadcom BCM57414 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE	P10115-B21
Broadcom BCM57504 Ethernet 10/25Gb 4-port SFP28 OCP3 Adapter for HPE	P26269-B21

Notes: OCP1 Enablement Kit is required when install in OCP1 slot.

100 Gigabit Ethernet adapters
Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 OCP3 Adapter for HPE	P22767-B21

Notes: OCP1 Enablement Kit is required when install in OCP1 slot.

Core Options

HPE InfiniBand

Notes:

— When AOC (Active Optical Cables) and processors TDP greater than 270W are selected, limited to 25°C maximum inlet temperature is supported with all drive cage combinations.

— When AOC (Active Optical Cables) and processors TDP equal or less than 270W are selected, limited to 25°C maximum inlet temperature is supported with 8SFF x4 U.3 Tri-Mode FIO Drive Cage Kit (P47218-B21), or 3 SFF/LFF drive cages selected.

HPE InfiniBand HDR100/Ethernet 100Gb 1-port QSFP56 PCIe4 x16 MCX653105A-ECAT Adapter	P23665-B21
HPE InfiniBand HDR100/Ethernet 100Gb 2-port QSFP56 PCIe4 x16 MCX653106A-ECAT Adapter	P23666-B21

HPE Power Supplies

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 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.

Notes:

— 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: https://poweradvisorext.it.hpe.com/?Page=Index

— Visit **HPE Power Cords and Cables** for a full list of optional power cords.

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

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

HPE 500W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	865408-B21

Notes: Support limited to single 125W TDP Processor.

HPE 800W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	P38995-B21
HPE 1000W Flex Slot Titanium Hot Plug Low Halogen Power Supply Kit	P03178-B21
HPE 1600W Flex Slot Platinum Hot Plug Low Halogen Power Supply Kit	P38997-B21

Notes: Only supports high line voltage (200 VAC to 240 VAC).

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.

Embedded Management

HPE 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 iLO Common Password Setting

HPE iLO Common Password FIO Setting	P08040-B21

Notes:
— Replaces iLO default randomized password by an HPE defined common password. HPE highly recommends changing this password immediately after the initial onboarding process.
— Customers who want to choose their own custom iLO default password should use the HPE Factory
— Express Integration Services.

HPE Security

HPE ProLiant ML350/ML110 Gen11 Intrusion Cable Kit	P47226-B21

HPE Cable Options

HPE ProLiant ML350 Gen11 LFF Embedded SATA Cable Kit	P47225-B21

Notes: This cable kit is used to support the embedded SATA controller.

HPE ProLiant ML350 Gen11 SFF Embedded SATA Cable Kit	P47232-B21

Notes: This cable kit is used to support the embedded SATA controller.

HPE ProLiant ML350 Gen11 LFF OROC Cable Kit	P47229-B21

Notes: This cable kit is used to support the HPE OCP-type RAID controller (OROC).

HPE ProLiant ML350 Gen11 SFF OROC Cable Kit	P47235-B21

Notes: This cable kit is used to support the HPE OCP-type RAID controller (OROC).

HPE ProLiant ML350 Gen11 LFF SAS/SATA PCIe Controller Cable Kit	P47227-B21

Notes: This cable kit is used to support the HPE stand-up PCIe storage controller. One cable kit is required for one controller.

HPE ProLiant ML350 Gen11 SFF Tri-Mode PCIe Controller Cable Kit	P47233-B21

Notes: This cable kit is used to support the HPE stand-up PCIe storage controller. One cable kit is required for one controller.

HPE ProLiant ML350 Gen11 8NVMe x4 Direct Attach FIO Cable Kit	P48399-B21

Notes: .
— This cable kit must be selected when 8SFF x4 U.3 Tri-Mode FIO Drive Cage Kit (P47218-B21) is ordered without SR932i-p (P47184-B21).
— For details on cabling options and cable routing instructions, refer to **HPE ML350 Gen11 User Guide**

Additional Options

HPE ProLiant ML350 Gen11 8SFF x4 U.3 Tri-Mode FIO Cable Kit	P47234-B21

Notes:
- This cable kit must be selected when 8SFF x4 U.3 Tri-Mode FIO Drive Cage Kit (P47218-B21) and SR932i-p (P47184-B21) are ordered.
- For details on cabling options and cable routing instructions, refer to **HPE ML350 Gen11 User Guide**

HPE ProLiant ML350 Gen11 OCP1 Enablement Kit	P47230-B21

Notes:
- This cable kit must be selected when x16 OCP NIC adapter ordered on OCP 1 slot.
- One Flex I/O connector will be occupied. For details on cabling options and cable routing instructions, refer to **HPE ML350 Gen11 User Guide**

HPE ProLiant ML350 Gen11 OCP2 Enablement Kit	P47231-B21

Notes:
- This cable kit must be selected when 2 OCP adapters ordered.
- One or two Flex I/O connector will be occupied. Depends on adapter model with x8 or x16. For details on cabling options and cable routing instructions, refer to **HPE ML350 Gen11 User Guide**

HPE ProLiant ML350 Gen11 Serial Port Cable Kit	P55062-B21

HPE Tape Backup

For the complete range of tape drives, autoloaders, libraries and media see:
https://www.hpe.com/us/en/storage/storeever-tape-storage.html.
For hardware and software compatibility of Hewlett Packard Enterprise tape backup products
http://www.hpe.com/storage/BURAcompatibility.

Notes:
- When RDX ordered, Tertiary Riser Kit (P49693-B21) is required.
- Support one internal RDX installation in Box 1 space with maximal 2 SFF/LFF Drive Cage in Box 2/3.
- Change the Thermal Configuration to Increased Cooling mode in BIOS/Platform Configuration (RBSU) menu when internal RDX is installed.

HPE Tape Drives

HPE StoreEver LTO-8 Ultrium 30750 External Tape Drive	BC023A
HPE StoreEver LTO-9 Ultrium 45000 External Tape Drive	BC042A
HPE StoreEver LTO-7 Ultrium 15000 External Tape Drive	BB874A

HPE Tape Drives Cartridge

HPE LTO-6 Ultrium 6.25TB RW Data Cartridge	C7976A
HPE LTO-7 Ultrium 15TB RW Data Cartridge	C7977A
HPE LTO-8 Ultrium 30TB RW Data Cartridge	Q2078A
HPE LTO-9 Ultrium 45TB RW Data Cartridge	Q2079A

HPE Tape Backup Products

HPE StoreEver Mini-SAS High Density to 4-lane Mini-SAS External Fanout 2m Cable	K2R09A
HPE StoreEver Mini-SAS High Density to 4-lane Mini-SAS External Fanout 4m Cable	K2R10A

HPE RDX Products

HPE RDX External Docking Station	C8S07B
HPE RDX Internal Docking Station	C8S06A
HPE RDX 4TB Removable Disk Cartridge	Q2048A

Additional Options

HPE RDX 2TB Removable Disk Cartridge	Q2046A
HPE RDX 500GB Removable Disk Cartridge	Q2042A
HPE RDX 1TB Removable Disk Cartridge	Q2044A

Internal RDX Support Kit

HPE ProLiant ML350/ML110 Gen11 Internal RDX Support Kit	P49694-B21

Notes: Supporting cables to add additional internal RDX device for data backup or archiving.

HPE Storage Options

Emulex Fibre Channel HBAs

HPE SN1700E 64Gb 1-port Fibre Channel Host Bus Adapter	R7N77A
HPE SN1700E 64Gb 2-port Fibre Channel Host Bus Adapter	R7N78A
HPE SN1610E 32Gb 1-port Fibre Channel Host Bus Adapter	R2J62A
HPE SN1610E 32Gb 2-port Fibre Channel Host Bus Adapter	R2J63A

QLogic Fibre Channel HBAs

HPE SN1610Q 32Gb 1-port Fibre Channel Host Bus Adapter	R2E08A
HPE SN1610Q 32Gb 2-port Fibre Channel Host Bus Adapter	R2E09A

Converged Network Adapters

HPE CN1200R 10GBASE-T Converged Network Adapter	Q0F26A
HPE CN1300R 10/25Gb Dual Port Converged Network Adapter	Q0F09A

Notes: For the complete listing of Fibre Channel Converged Network Adapters please see:
https://www.hpe.com/us/en/product-catalog/servers/adapters

HPE Racks

- Please see the **HPE Advanced Series Racks QuickSpecs** for information on additional racks options and rack specifications.
- Please see the **HPE Enterprise Series Racks QuickSpecs** for information on additional racks options and rack specifications.
- Please see the **HPE Standard Series Racks QuickSpecs** for information on additional racks options and rack specifications.

HPE Power Distribution Units (PDUs)

- Please see the **HPE Basic Power Distribution Units (PDU) QuickSpecs** for information on these products and their specifications.
- Please see the **HPE Metered Power Distribution Units (PDU) QuickSpecs** for information on these products and their specifications.
- Please see the **HPE Intelligent Power Distribution Unit (PDU) QuickSpecs** for information on these products and their specifications.
- Please see the **HPE Metered and Switched Power Distribution Units (PDU) QuickSpecs** for information on these products and their specifications.

Additional Options

HPE Uninterruptible Power Systems (UPS)
- To learn more, please visit the **HPE Uninterruptible Power Systems (UPS) web page.**
- Please see the **HPE DirectFlow Three Phase Uninterruptible Power System QuickSpecs** for information on these products and their specifications.
- Please see the **HPE Line Interactive Single Phase UPS QuickSpecs** for information on these products and their specifications.

HPE T750 Gen5 NA/JP UPS with Management Card Slot	Q1F47A
HPE T750 Gen5 INTL UPS with Management Card Slot	Q1F48A
HPE T1000 Gen5 NA/JP UPS with Management Card Slot	Q1F49A
HPE T1000 Gen5 INTL UPS with Management Card Slot	Q1F50A
HPE T1500 Gen5 NA/JP UPS with Management Card Slot	Q1F51A
HPE T1500 Gen5 INTL UPS with Management Card Slot	Q1F52A

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

Rail Kits

HPE ProLiant ML350/ML110 Gen11 T/R Conversion Kit	P47394-B21

Notes: Easy install rack rail tray which takes up 1U height in a standard rack facility. This kit is supported in both ML350 and ML110 Gen11 for tower to rack conversion. This kit includes CMA and is shipped as standard.

Memory

Memory Population guidelines
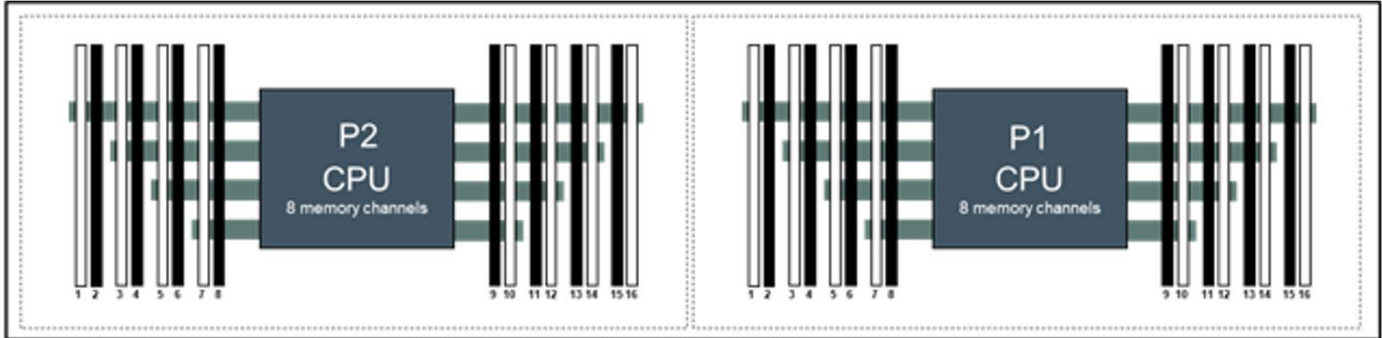
HPE ML350 Gen11 Server (Front of server)

Notes: 2 Slots per channel

HPE ProLiant ML350 Gen11 Servers 16 slots per CPU DIMM population order

1 DIMM										10						
2 DIMMs[2]			3							10						
4 DIMMs[2]			3				7			10				14		
6 DIMMs			3		5		7			10				14		16
8 DIMMs[1,2]	1		3		5		7			10		12		14		16
12 DIMMs	1	2	3		5	6	7			10	11	12		14	15	16
16 DIMMs[1,2]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Notes:

- [1.] Support SGX (Software Guard Extensions)
- [2] Support Hemi (hemisphere mode)

General Memory Population Rules and Guidelines:

- Install DIMMs only if the corresponding processor is installed. If only one processor is installed in a 2-processor system, only half of the DIMM slots are available to populate.
- If a memory channel consists of more than one DIMM slot, the white DIMM slot is located furthest from the CPU. White DIMM slots denote the first slot to be populated in a channel. For one DIMM per channel (DPC), populate white DIMM slots only
- Rank mixing is not allowed on a channel except for 1 rank + 2 rank combination when all 16 DIMMs for a Processor socket is populated. (2 rank in white slot, 1 rank in block slot),
- No x4 mixing with x8 across a socket.
- If multiple CPUs are populated, split the HPE SmartMemory DIMMs evenly across the CPUs and follow the corresponding CPU rules when populating DIMMs.
- To maximize performance, it is recommended to balance the total memory capacity across all installed processors and load the channels similarly whenever possible.
- If the number of DIMMs does not spread evenly across the CPUs, populate as close to evenly as possible.
- Avoid creating an unbalanced configuration for any CPU.
- The maximum memory capacity is a function of the number of DIMM slots on the platform—the largest DIMM capacity qualified on the platform and the number and model of qualified processors installed on the platform.

Memory

- Do not mix HPE SmartMemory RDIMMs and HPE SmartMemory LRDIMMs in the same system.
- Rank mixing is not allowed on a channel except for 1 rank + 2 rank combination (2 rank in white slot, 1 rank in block slot), when all 16 DIMMs for a Processor socket is populated.
- The 256 GB 8R 3DS RDIMM can be mixed with 128 GB 4R 3DS RDIMM ONLY in 16 DIMMs populated. 256 GB 8R 3DS RDIMM needs to be in white slot while 128 GB 4R 3DS RDIMM needs to be in black slot.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- DIMMs of different speeds may be mixed in any order; however, the server will select the lowest common speed among all of the DIMMs on all of the CPUs.
- HPE SmartMemory DIMMs and HPE NVDIMM-Ns from previous generation servers are not compatible with the current generation. Certain HPE SmartMemory features such as memory authentication and enhanced performance may not be supported.
- There are no performance implications for mixing sets of different capacity DIMMs at the same operating speed. For example, latency and throughput will not be negatively impacted by installing an equal number of 32 GB 1rank x4 DDR5-4800 DIMMs (in block slot) and 64 GB 2rank x4 DDR5-4800 DIMMs (in white slot).
- Take each DIMM type and create a configuration as if it were a homogeneous configuration.
- For details on the HPE Server Memory Options Population Rules, visit: **http://www.hpe.com/docs/memory-population-rules**.
- For additional information, please see the **HPE DDR5 SmartMemory QuickSpecs**.

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

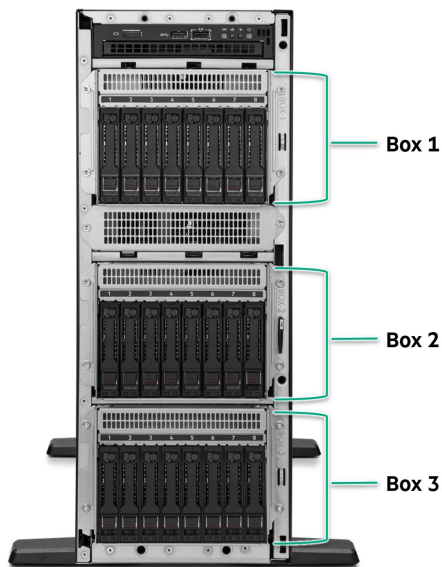For details on the HPE Server Memory speed, visit: **https://www.hpe.com/docs/memory-speed-table**.

Storage
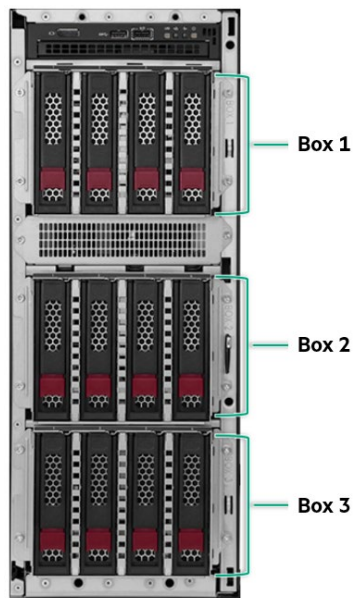
12 LFF hot-plug drive model:
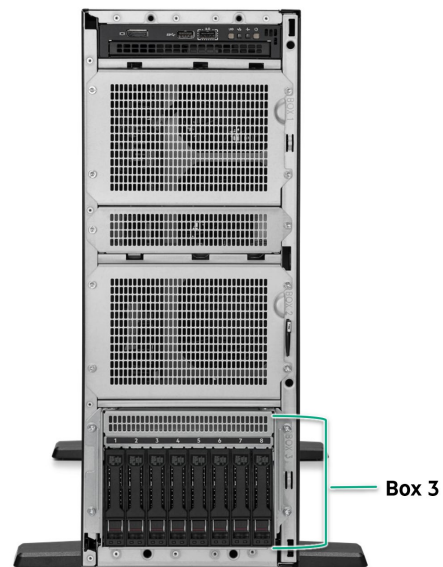Tower – shown without the tower feet.
- 3 x 4LFF SAS/SATA hot-pluggable HDD/SSD Cage Kit in Box 1/2/3.

24 SFF hot-plug drive model:
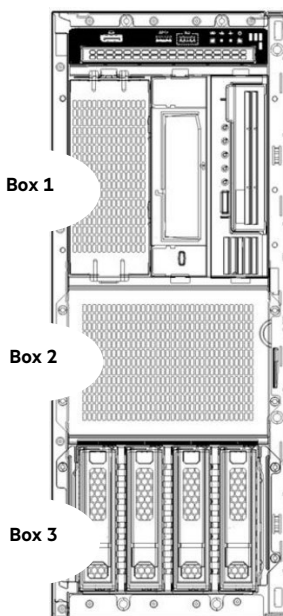Tower – shown with the tower feet.
- 3 x 8SFF SAS/SATA/NVME hot-pluggable HDD/SSD Cage Kit in Box 1/2/3.

8 SFF hot-plug drive model:
Tower – shown with the tower feet.
- 1 x 8SFF SAS/SATA/NVME or x4 NVME U.3 hot-pluggable Cage Kit in Box 3.

4LFF hot-plug drive and RDX model:
Tower – shown without the tower feet.
- 1x 4LFF SAS/SATA hot-pluggable HDD/SSD Cage Kit in Box 3.
- RDX in Box 1

Technical Specifications

System Unit

Dimensions

- **Tower**
  46.2 (H) x 71.2 (D) x 17.4 (W) cm
  18.2 (H) x 28 (D) x 6.85 (W) in
- **Rack – System only**
  17.4 (H/4U) x 64.8 (D) x 44.5 (W) cm
  6.85 (H) x 25.51 (D) x 17.52 (W) in
- **Tower-to-Rack Conversion Kit (1U)**
  4.445 (H/1U) x 69.2 (D/without CMA. Depth with CMA: 83.5) x 45.2 (W) cm
  1.75 (H/1U) x 27.23 (D/without CMA. Depth with CMA: 32.89) x 17.795 (W) in

Weight (approximate)

- **24.73 kg (54.52 lb)**
  SFF Minimum:
  8SFF chassis with 1x SFF HDD and 7x SFF HDD blanks, 1x HDD Drive Cage blank, 2x Media Bay blanks, 1x DVD bay
  blank, 1x processor including standard heatsink, 1x DIMM, 1x power supply (plus blank), 1x Primary Riser, 1x Riser Cage
  blank, 2x OCP blanks, Cables for the above.
- **37.18 kg (81.97 lb)**
  SFF Maximum:
  8SFF chassis with 24x SFF HDDs with 3x HDD Drive Cage, 1x DVD device, 2x processor including standard heatsink, 24x
  DIMMs, 2x power supply, 2x Primary Riser, 1x Tertiary Riser, 1x Megacell, 2x OCP, 8x Single Width GPU card, 2x x8
  HHHL card (Max. 166g), Cables for the above.
- **27.42 kg (60.45 lb)**
  LFF Minimum:
  4LFF chassis with 1x LFF HDD and 3x HDD blanks, 1x HDD Drive Cage blank, 2x Media Bay blanks, 1x DVD bay blank,
  1x processor including standard heatsink, 1x DIMM, 1x power supply (plus blank), 2x Primary Riser, 1x Tertiary Riser, 1x
  Megacell, 2x OCP blanks, 2x SR932i-p card, Cables for the above.
- **43.05 kg (94.91 lb)**
  SFF Maximum:
  4LFF chassis with 12x LFF HDDs with 3x HDD Drive Cage, 1x DVD device, 2x processor including performance heatsink,
  24x DIMMs, 2x power supply, 2x Primary Riser, 1x Tertiary Riser, 1x Megacell, 2x OCP, 4x Double Width x16 GPU card,
  2x FHHL card, 1x NS204i-u, Cables for the above.

Input Requirements (per power supply)

Rated Line Voltage
- 100 to 120 VAC
- 200 to 240 VAC

BTU Rating

Maximum
- For 500W Power Supply: 1902 BTU/hr (at 100 VAC), 1840 BTU/hr (at 200 VAC), 1832 BTU/hr (at 240 VAC)
- For 800W Power Supply: 3067 BTU/hr (at 100 VAC), 2958 BTU/hr (at 200 VAC), 2949 BTU/hr (at 240 VAC)
- For 1000W Power Supply: 3741 BTU/hr (at 100 VAC), 3596 BTU/hr (at 200 VAC), 3582 BTU/hr (at 240 VAC)
- For 1600W Power Supply: 5918 BTU/hr (at 200 VAC), 5884 BTU/hr (at 240 VAC

Technical Specifications

Power Supply Output (per power supply)

Rated Steady-State Power
- For 1600W (Titanium) Power Supply: 1600W (at 240 VAC), 1600W (at 240 VDC) for China only
- For 800W (Platinum) Power Supply: 800W (at 100 VAC), 800W (at 240 VAC), 800W (at 240 VDC) input for China only
- For 500W (Platinum) Power Supply: 500W (at 100 VAC), 500W (at 240 VAC), 500W (at 240 VDC) input for China only

Maximum Peak Power
- For 1600W (Titanium) Power Supply: 1600W (at 240 VAC), 1600W (at 240 VDC) for China only
- For 800W (Platinum) Power Supply: 800W (at 100 VAC), 800W (at 240 VAC), 800W (at 240 VDC) input for China only
- For 500W (Platinum) Power Supply: 500W (at 100 VAC), 500W (at 240 VAC), 500W (at 240 VDC) input for China only

System Inlet Temperature

- **Standard Operating Temperature**
  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 Temperature**
  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 (non-condensing)

- **Operating**
  8% to 90% - Relative humidity (Rh), 28°C maximum wet bulb temperature, non-condensing.
- **Non-operating**
  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).

Technical Specifications

Emission Classification (EMC) 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

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.

Acoustic Noise

Listed are the declared mean A-Weighted sound power levels (LwAm), declared average bystander position A-Weighted sound pressure levels (LpAm) and the statistical adder for verification, Kv, is a quantity to be added to the declared mean A-weighted sound power
level, LwA,m 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.

Test Case	1	2	3	4	5
Idle					
LwA,m	4.0 B	3.9 B	4.0 B	4.0 B	4.1 B
LpAm	26 dBA	27 dBA	25 dBA	25 dBA	25 dBA
Kv	0.4 B	0.4 B	0.4 B	0.4 B	0.4 B
Operating					
LwA,m	4.1 B	4.1 B	4.1 B	4.2 B	4.2 B
LpAm	26 dBA	26 dBA	26 dBA	26 dBA	26 dBA
Kv	0.4 B	0.4 B	0.4 B	0.4 B	0.4 B

Notes:

– The declared mean A-weighted sound power level, LWA,m, is computed as the arithmetic average of the measured.
– A-weighted sound power levels for a randomly selected sample, rounded to the nearest 0,1 B.
– The declared mean A-weighted emission sound pressure level, LpA,m, is computed as the arithmetic average of the measured A-weighted emission sound pressure levels at the bystander positions for a randomly selected sample, rounded to the nearest 1 dB.
– The statistical adder for verification, Kv, is a quantity to be added to the declared mean A-weighted sound power level, LWA,m, such that there will be a 95 % probability of acceptance, when using the verification procedures of ISO 9296, if no more than 6,5 % of the batch of new equipment, has A-weighted sound power levels greater than (LWA,m + Kv).
– The quantity, LWA,c (formerly called LwA,m), can be computed from the sum of LWA,m and Kv.
– All measurements made to conform to ISO 7779 / ECMA-74 and declared to conform to ISO 9296 / ECMA-109.
– B, dB, abbreviations for bels and decibels, respectively, where 1 B = 10 dB.
– The results in this declaration apply only to the model numbers listed above when operating and tested according to the indicated modes and standards. A system with additional configuration components or increased operating functionality may increase the noise emission values.