## Overview

HPE ProLiant XL230a Gen9 Server

The HPE ProLiant XL230a Server delivers 2P performance, while taking advantage of the Apollo 6000 System's modular flexibility and rack-scale efficiency. This server leverages Intel's Xeon E5-2600 v3/v4 series processors and DDR 4 HPE SmartMemory. The modular HPE Apollo a6000 Chassis accommodates up to 10 single slot XL230a server trays to address various workload needs.

Rack scale power efficiency is fueled by an external power shelf, with easy Advanced Power Management for rack, chassis, server and component level management
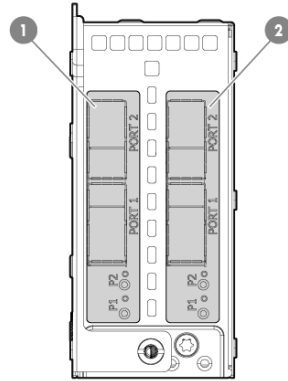
Front View Item Description
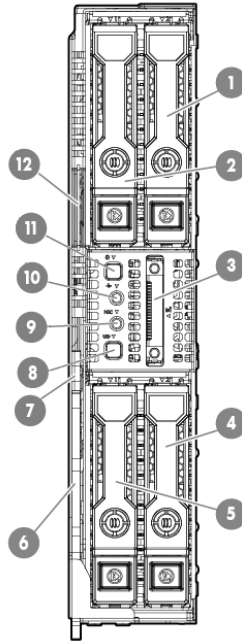
Item	Description
1.	Drive 2
2.	Drive 1
3.	SUV connector
4.	Drive 4
5.	Drive 3
6.	Server tray release lever
7.	Server tray release latch
8.	Power Button /Power LED
9.	Health LED
10.	NIC status LED
11.	UID button
12.	Serial label pull tab

Optional Features

Network IO Module

Options - Description

Dual FlexibleLOM Module		**PCIe / FlexibleLOM Module**	
1	x16 FlexibleLOM	**1**	x8 FlexibleLOM
2	x8 FlexibleLOM	**2**	x16 PCIe LP Gen3

Top View
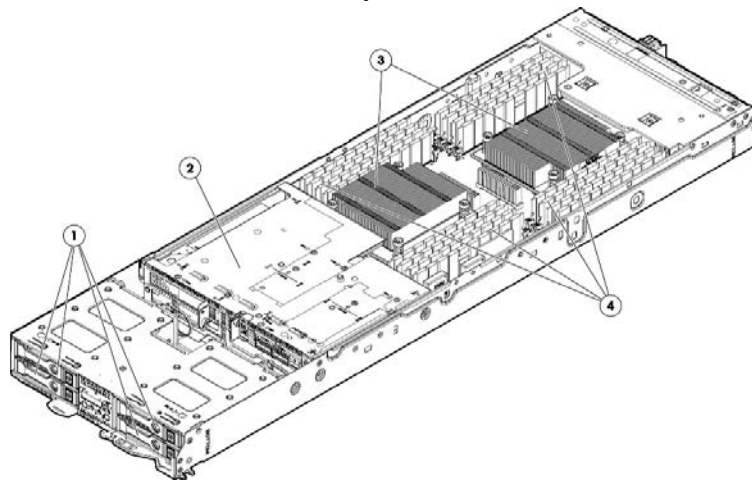
Item Description

1. SFF hard drive bays
2. Internal PCI Express x16 slot option
3. Support for 2 Intel Xeon E5-2600 v3/v4 series processors
4. Support for 16 DDR4 DIMMs

Optional Features

Processor

E5-2600 v4 series Processors / NOTE: Field upgrade is not available for v4 processors.

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
E5-2603v4	1.7GHz	6C	15MB	85W	6.4GT/s	1866
E5-2609v4	1.7GHz	8C	20MB	85W	6.4GT/s	1866
E5-2620v4	2.1GHz	8C	20MB	85W	8.0GT/s	2133
E5-2623v4	2.6GHz	4C	10MB	85W	8.0GT/s	2133
E5-2630v4	2.2GHz	10C	25MB	85W	8.0GT/s	2133
E5-2640v4	2.4GHz	10C	25MB	90W	8.0GT/s	2133
E5-2643v4	3.4GHz	6C	20MB	135W	9.6GT/s	2400
E5-2650v4	2.2GHz	12C	30MB	105W	9.6GT/s	2400
E5-2660v4	2.0GHz	14C	35MB	105W	9.6GT/s	2400
E5-2667v4	3.2GHz	8C	25MB	135W	9.6GT/s	2400
E5-2680v4	2.4GHz	14C	35 MB	120W	9.6GT/s	2400
E5-2683v4	2.1Ghz	16C	40MB	120W	9.6GT/s	2400
E5-2690v4	2.6GHz	14C	35MB	135W	9.6GT/s	2400
E5-2695v4	2.1GHz	18C	45MB	120W	9.6GT/s	2400
E5-2697v4	2.3GHz	18C	45MB	145W	9.6GT/s	2400
E5-2697Av4	2.6GHz	16C	40MB	145W	9.6GT/s	2400
E5-2698v4	2.2GHz	20C	50MB	135W	9.6GT/s	2400
E5-2699v4	2.2GHz	22C	55MB	145W	9.6GT/s	2400
E5-2699Av4	2.4GHz	22C	55MB	145W	9.6GT/s	2400

E5-2600 v3 series Processors

Model	CPU frequency	Cores	L3 Cache	Power	QPI	DDR4 Hz
E5-2603v3	1.6GHz	6	15MB	85W	6.4GT/s	1600
E5-2609v3	1.9GHz	6	15MB	85W	8.0GT/s	1600
E5-2620v3	2.4GHz	6	15MB	85W	8.0GT/s	1866
E5-2630v3	2.4Ghz	8	20MB	85W	8.0GT/s	1866
E5-2630Lv3	1.8GHz	8	20MB	55W	8.0GT/s	1866
E5-2637v3	3.5GHz	4	15MB	135W	9.6GT/s	2133
E5-2640v3	2.6GHz	8	20MB	90W	8.0GT/s	1866
E5-2643v3	3.4GHz	6	20MB	135W	9.6GT/s	2133
E5-2650v3	2.3GHz	10	25MB	105W	9.6GT/s	2133
E5-2650Lv3	1.8GHz	12	30MB	65W	9.6GT/s	2133
E5-2660v3	2.6GHz	10	25MB	105W	9.6GT/s	2133
E5-2667v3	3.2GHz	8C	20 MB	135W	9.6 GT/s	2133
E5-2670v3	2.3GHz	12	30MB	120W	9.6GT/s	2133
E5-2680v3	2.5GHz	12	30MB	120W	9.6GT/s	2133
E5-2683v3	2.0GHz	14	35MB	120W	9.6GT/s	2133
E5-2690v3	2.6GHz	12	30MB	135W	9.6GT/s	2133

Optional Features

E5-2695v3	2.3GHz	14	35MB	120W	9.6GT/s	2133
E5-2698v3	2.3GHz	16	40MB	135W	9.6GT/s	2133

Chipset
Intel® C610 Series Chipset
NOTE: For more information regarding Intel® chipsets, please see the following URL:
http://www.intel.com/products/server/chipsets/.

On System Management Processor
HPE iLO (Firmware: HPE iLO 4)
NOTE: For more information, visit: http://www.hpe.com/go/ilo

Memory Protection
Advanced ECC (multi-bit error protection)
Memory Online Spare Mode (Rank Spare Mode)

Memory

Type	HPE SmartMemory
	DDR4 Load Reduced (LRDIMM), or Registered (RDIMM)
DIMM Slots Available	16 DIMM Slots available
Maximum DIMMs (per server tray)	2048GB (16 x 128GB)

NOTE: HPE memory from previous generation servers (DDR3) are not compatible with the HPE ProLiant XL230a Gen9 Server.
NOTE: To realize the performance memory capabilities listed in this document, HPE SmartMemory is required. For additional information, please see the HPE SmartMemory QuickSpecs at:
https://www.hpe.com/h20195/v2/GetPDF.aspx/c04355083.pdf
NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400Mhz, 2133MHz or 1866MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: **http://h22195.www2.hpe.com/MemoryTool/Home/Legal**
NOTE: E5-2600 v4 Series processors will only support DDR4 -2400 DIMMs

Network Controller
Network Module Options
HPE Apollo 6000 Dual FlexibleLOM Riser
NOTE: This option supports up to two FlexLOM options.
HPE Apollo 6000 PCIe/FlexibleLOM Riser FIO Kit
NOTE: This option supports one LP PCIe & one FlexLOM.
This option requires the use if a 1200mm deep rack to ease the possible intereference issues when the rack door is closed.
HPE Apollo 6000 Dual 1GbE 364i FIO Kit
NOTE: This option does not support additional LP PCIe & FlexLOM options.
Ethernet Options
HPE 1Gb Ethernet 4P 331FLR Adptr
HPE Ethernet 1Gb 4-port 366FLR Adapter
HPE FlexFabric 10Gb 2P 533FLR-T Adptr
HPE FlexFabric 10Gb 2P 534FLR-SFP+ Adptr
HPE Ethernet 10Gb 2P 546FLR-SFP+ Adptr
HPE FlexFabric 10Gb 2P 556FLR-SFP+ Adptr
HPE Ethernet 10Gb 2P 560FLR-SFP+ Adptr
HPE Ethernet 10Gb 2P 561FLR-T Adptr
HPE Ethernet 10Gb 2-port 562FLR-SFP+Adpt
HPE Ethernet 10G 2-port 546SFP+ Adptr
HPE Ethernet 10Gb 2-port 562SFP+ Adptr
HPE Ethernet 10/25Gb 2P 640FLR-SFP28 Adapter
HPE Ethernet 10/25Gb 2P 640SFP28 Adapter

Optional Features

InfiniBand Options
HPE IB FDR/EN 40Gb 2P 544+FLR-QSFP Adptr
HPE IB QDR/EN 10Gb 2P 544+FLR-QSFP Adptr
HPE IB FDR 2P 545FLR-QSFP Adptr
HPE IB EDR/EN 100Gb 1P 840QSFP28 Adptr
HPE IB EDR/EN 100Gb 2P 840QSFP28 Adptr
QLogic 4X QDR IB PCI-e G2 HCA

Intel Networking Options
HPE 100Gb 1P OP101 QSFP28 x16 OPA Adptr

HPE 100Gb 1P OP101 QSFP28 x8 OPA Adptr

Expansion Slots	Expansion Slot #	Technology	Bus Width*	Form Factor
	Internal PCIe	PCIe 3.0	X16	Low profile
	FlexibleLOM 1	PCIe 3.0	x16	FlexibleLOM
	FlexibleLOM 2	PCIe 3.0	x8	FlexibleLOM

NOTE: This requires ordering the HPE Apollo 6000 Dual FlexibleLOM Riser 757401-B21

	FlexibleLOM	PCIe 3.0	X8	FlexibleLOM
	External PCIe	PCIe 3.0	x16	Low profile

NOTE: This requires ordering HPE Apollo 6000 PCIe / FlexLOM Riser FIO Kit 804165-B21

*Indicates the number of physical electrical lanes running to the connector.
NOTE: All PCIe slots are internal unless indicated (i.e. PCIe / FlexLOM network module option)
PCIe/Flexible LOM option requires the use if a 1200mm deep rack to ease the possible intereference issues when the rack door is closed.

HPE Server ROM   HPE ROM (Read Only Memory) is now digitally signed using the HPE Corporate Signing Service. This signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HPE ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HPE ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

The HPE ProLiant ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (Integrated PCI devices and optional PCIe cards).
- Customer-specific BIOS configuration (using the HPE ROM-Based Setup Utility (RBSU).

NOTE: For further information, please refer to the HPE RBSU (ROM based setup utility) user guide: **HPE RBSU.**

HPE Server Unified Extensible Firmware   HPE's ProLiant System BIOS is an EDK2 UEFI solution, and adheres to the latest revisions of UEFI Class 2 specifications which supports both legacy boot and UEFI boot operation. The HPE ProLiant XL230a Gen9

Optional Features

Interface (UEFI) or defaults to UEFI boot operation and can be factory or field configured for Legacy boot operation.
Legacy Mode

> **NOTE:** For UEFI boot operation, boot environment and OS image installations should be configured properly to support UEFI.
> **NOTE:** For more information on Hewlett Packard Enterprise's ProLiant System BIOS and UEFI, see the UEFI Information Library: http://www.hpe.com/go/uefi/docs
> **NOTE:** HPE Legacy FIO Mode Setting (758959-B22) can be selected to configure the system in UEFI mode in the factory.

To modify the server configuration ROM default settings, press F9 in the HPE ProLiant POST screen to enter the UEFI System Utilities screen. By default, the System Utilities menus are in the English language.

UEFI enables numerous new capabilities, including both industry standard functionality and features specific to HPE ProLiant servers. Following are some of the features that UEFI enables and that the HPE ProLiant XL230a Gen9 can support when configured for UEFI boot operation:

- Secure Boot - A new feature in which the system firmware, option card firmware, operating systems, and software collaborate to greatly enhance platform security.
- Operating system specific functionality - Microsoft Windows 2012 supports several features only when installed in UEFI mode.
- Support for > 2.2 TB (using GPT) boot drives - Such drives could previously only be used for boot drives when using RAID solutions such as HPE Smart Array.
- UEFI Shell - Provides a pre-boot environment for running scripts and tools. The HPE ProLiant UEFI Shell provides both standard capabilities as well as numerous enhancements.
- PXE boot support for IPv6 networks.
- PXE Multicast Boot allowing for faster PXE deployments for large numbers of servers.
- Boot support for option cards that only support a UEFI option ROM.

> **NOTE:** When the server is configured for UEFI Boot Mode, PXE servers must be configured with a UEFI boot image. When the server boots in UEFI mode, it does not boot media with a legacy OS installation. This includes DOS targets and Windows or Linux systems installed in Legacy mode. The reverse is also true for servers that boot in Legacy mode. If Microsoft Windows 2008 or Windows 2008 R2 is used in UEFI Boot Mode, UEFI Optimized Mode must be disabled (this option is enabled by default). This is required to work around an issue in Windows 2008 / 2008 R2 that requires legacy BIOS components necessary for video operations in Windows.

Storage Controller **Smart Array Controller**
HPE Dynamic Smart Array B140i Controller
HPE Smart Array P440 Controller*
Host Bus Adapter
HPE H240 Smart HBA
HPE H241 Smart HBA
NOTE: The H241 is only supported with the HPE Apollo 6000 PCIe/FlexLOM Riser FIO Kit
 Fibre Channel Host Bus Adapter
HPE SN1100E 16Gb 1P FC HBA
HPE SN1100E 16Gb 2P FC HBA
NOTE: Fibre Channel support requires the HPE Apollo 6000 PCIe/FlexLOM Riser FIO Kit
Storage Controller Cable Kits (for 12G server tray)
HPE XL230a Mini-SAS B140i 12G FIO Cable*
HPE XL230a Mini-SAS H240 12G Cable*
HPE XL230a Mini-SAS P440 12G Cable*
Other Storage Controller Options
HPE P440 Smart Storage Battery (12W) *
*Some features are not available on specific models
NOTE: The H240 controller and the embedded B140i will operate in UEFI mode only. For legacy support, AHCI mode is required.

Optional Features

Internal Storage Devices	Internal MicroSD		

Maximum Internal Storage	Hot Plug SFF SAS HDD	15.36TB	4 x 3.84TB
	Hot Plug SFF SATA HDD	8TB	4 x 2TB
	Hot Plug SFF SSD	15.36TB	4 x 3.84TB

Interfaces	KVM	Serial USB Video Port (SUV) P/n: 676277-B21
	MicroSD	1 (internal)
	USB Ports	2 (external via SUV)
	HPE iLO Remote Management Network Port	Aggregated via HPE Apollo a6000 Chassis
	Health LED	1
	Power	1
	UID	1

Industry Standard Compliance	ACPI 2.0b Compliant
	PCIe 3.0 Compliant
	WOL Support
	Microsoft® Logo certifications
	PXE Support
	USB 1.1 and 2.0 Compliant
	SMBIOS 2.6.1

Power Specifications	To review typical system power ratings use the HPE Power Advisor which is available via the online tool located at: **HP Power Advisor.**
	NOTE: Power Specification and Technical Content for supported power supplies can be found at: **http://h18000.www1.hpe.com/products/QuickSpecs/14209/14209.html**

Operating Systems and Virtualization Software Support for ProLiant Servers	Microsoft Windows Server
	Red Hat Enterprise Linux (RHEL)
	SUSE Linux Enterprise Server (SLES)
	Canonical Ubuntu
	VMware
	CentOS
	Fedora
	NOTE: Only 64-bit versions of these operating systems are supported.
	NOTE: For more information on the HPE Certified and Supported ProLiant Servers for OS and Virtualization Software and latest listing of software drivers available for your server including how to purchase from Hewlett Packard Enterprise, please visit our OS Support Site at: **http://www8.hp.com/us/en/products/servers/management/operating-environments/os-support-matrix.html** and our driver download page: http://www.hp.com/support

Graphics	Integrated Matrox G200 video standard
	• 1280 x 1024 (32 bpp)
	• 1920 x 1200 (16 bpp)

Optional Features

HPE iLO 4 On System Management Memory

- 16 MB Flash
- 256 MB DDR 3 with ECC (112 MB after ECC and video)

Form Factor	The ProLiant XL230a Gen9 Server is a single-slot tray for the HPE Apollo a6000 Chassis. **NOTE:** There are various XL230a server trays	
Embedded Management	**HPE Integrated Lights Out**	Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at: **https://www.hpe.com/us/en/servers/integrated-lights-out-ilo.html**
	UEFI	Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at: **https://www.hpe.com/us/en/product-catalog/detail/pip.6935826.html.**
	HPE RESTful API	RESTful API is an application programming interface. RESTful Web Service API served by iLO's web server **https://www.hpe.com/us/en/servers/restful-api.html**
	Intelligent Provisioning	Provision servers by discovering and deploying 1 to few servers with Intelligent Provisioning. Learn more at **https://www.hpe.com/us/en/product-catalog/detail/pip.5219984.html**

Optional Features

Server Utilities	**HPE Smart Update**	Optimize firmware and driver updates with HPE Smart Update solutions. Learn more at: **https://www.hpe.com/us/en/product-catalog/detail/pip.5182020.html/go/smartupdate**
	HPE Systems Insight Manager (HPE SIM)	HPE SIM allows you to monitor the health of your HPE ProLiant Servers and HPE Integrity Servers, and also provides you with basic support for non-Hewlett Packard Enterprise servers. HPE SIM also integrates with HPE SUM to provide quick and seamless firmware updates. Learn more at: **https://www.hpe.com/us/en/product-catalog/detail/pip.489496.html**
	Scripting Tool Kit and Windows PowerShell	Provision 1 to many servers using your own scripts to discover and deploy them with HPE Scripting Tool Kit for Windows and Linux or HPE Scripting Tools for Windows PowerShell. Learn more at: **https://www.hpe.com/us/en/product-catalog/detail/pip.5219389.html**
	HPE RESTful Interface Tool	HPE RESTful API tool is a scripting tool to provision servers using RESTful API Interface to discover and deploy servers at scale. Learn more at: **https://www.hpe.com/us/en/servers/restful-api.html**
	HPE iLO Mobile Application	Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: **https://www.hpe.com/us/en/servers/integrated-lights-out-ilo.html**
	HPE Insight Online	HPE Insight Online, available at no additional cost as part of your Hewlett Packard Enterprise warranty, Care Pack or contractual support agreement with Hewlett Packard Enterprise , is a personalized dashboard for simplified tracking of IT operations and support information from anywhere, anytime. Learn more at: **http://www8.hp.com/us/en/business-services/it-services.html?compURI=1078312**
Embedded Management	**HPE Integrated Lights Out**	Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at: **https://www.hpe.com/us/en/servers/integrated-lights-out-ilo.html**
HPE Insight management software	**HPE Service Pack for ProLiant (SPP)**	HPE Service Pack for ProLiant (SPP) and HPE Smart Update Manager (HPE SUM) provide a comprehensive approach to firmware and system software maintenance. Together they provide better operating stability and ensure maximum uptime. The SPP will be updated at a predictable cadence, typically coinciding with new Hewlett Packard Enterprise server hardware launches. By enabling firmware to be updated online and integrating firmware and system software updates in one operation, HPE SUM and the SPP offer faster updates of individual servers and dramatically faster updates of entire HPE Apollo a6000 Chassis. Further improving system uptime and stability is the fact that Hewlett Packard Enterprise provides 12 months of support for each Service Pack for ProLiant release (may vary by region). The user experience around HPE SUM and the SPP has been improved in several ways, starting with the web download. A single web page provides access to a single download containing both the latest version of HPE SUM and the latest SPP. Optional smaller subsets with only specific types of servers or specific operating systems are offered to save on download time. The HPE SUM application provides a straightforward, intuitive user interface that guides the user through the steps of discovery, analyses and update, providing comprehensive information on available updates, criticality and interdependencies. This information is also available in reports. By providing the option of multiple local or shared repositories which can be easily updated from hp.com, HPE SUM provides the tools to optimize stability and consistency throughout the company. While HPE SUM and the SPP recommend the combinations of firmware and system

Optional Features

software that Hewlett Packard Enterprise has found to be the best practice, the application gives customers the flexibility to set their own specific baseline.

The Service Pack for ProLiant has been rigorously tested with specific attention for interaction between firmware, drivers and agents both within the server as well as in interaction with the HPE Apollo a6000 chassis. This testing ensures the highest quality as well as providing the input for HPE SUM to deploy updates taking into account all interdependencies, when determining the correct updates and order of update deployment.

NOTE: The Service Pack for ProLiant (which includes HPE SUM) can be downloaded from **https://www.hpe.com/us/en/product-catalog/detail/pip.service-pack-for-proLiant.5104018.html** More information can be found: **https://www.hpe.com/us/en/product-catalog/detail/pip.5182020.html/go/smartupdate** and **https://www.hpe.com/us/en/product-catalog/detail/pip.5182020.html/go/smartupdate**

Security	Power-on password
	Keyboard password
	QuickLock, Network Server Mode
	Serial interface control
	Administrator's password
	iLO 4 (Integrated Lights-Out 4) has 12 customizable user accounts and SSL encryption
	iLO 4 can be disabled via a Global Setting
	iLO Advanced supports directory services integration
	TPM (Trusted Platform Module) 1.2 option

Warranty

This product is covered by a global limited warranty and supported by Hewlett Packard Enterprise Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners (may vary by region). Hardware diagnostic support and repair is available for one year 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 Care Pack services or customized service agreements. Hard drives have either a one year or three year warranty.

NOTE: Server Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://h18004.www1.hpe.com/products/servers/platforms/warranty/index.html

HPE Insight management software

HPE Insight Control

HPE Insight Control, a product option, delivers essential infrastructure management that can help save time and money by making it easy to deploy, migrate, monitor, remote control, and optimize your IT infrastructure through a single, simple management console. For more information, see: **http://www8.hp.com/us/en/products/servers/management/insight-control/**

HPE Insight Control includes one year of 24 x 7 HPE Software Technical Support and Update Service ensuring rapid access to Hewlett Packard Enterprise support staff and proactive delivery of software updates. For

Optional Features

		more information about this service, see: **https://www.hpe.com/us/en/product-catalog/detail/pip.services.hpe-insight-control.3312156.html**
	HPE iLO Advanced	HPE Integrated Lights-Out Advanced License a product option, providing smart remote server management without compromise. iLO Advanced unlocks the full set of remote administration functionality for all HPE ProLiant servers by activating the full Virtual Keyboard Video and Mouse remote console, multi-user collaboration, console record and replay, GUI-based and scripted virtual media and virtual folders, and enhanced security and power management functionality. For more information, see: **https://www.hpe.com/us/en/product-catalog/detail/pip.332279.html**
	HPE iLO Scale-Out	The HPE iLO Scale-Out license ideal for web/hosting/cloud service providers and High Performance Computing environments. This license is a specific subset of iLO Advanced functionality, provides fast remote access through Text Console via SSH, lower operational cost with Dynamic power capping, and faster time to resolution through Email-based Alerting and proactive notifications. With this newly designed HPE iLO Scale-Out license HPC customers now have a server management package solely design and priced for their massive data environments. HPE iLO Scale-Out is available on all HPE ProLiant Gen9 servers. For more information, see: **https://www.hpe.com/us/en/product-catalog/detail/pip.5294354.html**
	HPE Matrix Operating Environment	The HPE Matrix Operating Environment (Matrix OE) for ProLiant and Integrity servers is an integrated command center that helps you instantly adjust to dynamic business demands. This advanced infrastructure management software lets you reduce the cost of common data center tasks by up to 40 percent while keeping pace with your changing business. The HPE Matrix OE includes the automated provisioning, optimization, and recovery management capabilities for HPE CloudSystem Matrix, the ideal platform for private cloud and Infrastructure as a Service (IaaS). **NOTE:** For more information, visit: **HPE MatrixOE**
High Performance Clusters	HPE Cluster Platforms	HPE Cluster Platforms are specifically engineered, factory-integrated large-scale ProLiant clusters optimized for High Performance Computing, with a choice of servers, networks and software. Operating system options include specially priced offerings for Red Hat Enterprise Linux and SUSE Linux Enterprise Server, as well as Microsoft Windows HPC Server. A Cluster Platform Configurator simplifies ordering. **https://www.hpe.com/us/en/solutions/high-performance-computing.html**
	HPE HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HPE Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by Hewlett Packard Enterprise when integrated within an Hewlett Packard Enterprise cluster. Flexible, validated solutions can be defined with the help of configuration tools. **https://www.hpe.com/us/en/solutions/high-performance-computing.html**
	HPE Insight Cluster Management Utility	HPE Insight Cluster Management Utility (CMU) is an Hewlett Packard Enterprise -licensed and Hewlett Packard Enterprise -supported suite of tools that are used for lifecycle management of hyperscale clusters of Linux ProLiant systems. CMU includes software for the centralized provisioning, management and monitoring of nodes. CMU makes the administration of clusters user friendly, efficient, and effective.

Optional Features

https://www.hpe.com/us/en/product-catalog/detail/pip.3296361.html

HPE Insight Online	HPE Insight Online is a new addition to the HPE Support Center for one stop, secure access to product and HPE support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HPE Insight Remote Support. With Insight Online's easy navigation you can efficiently track your IT support contracts and device status from anywhere and at any time. **http://www8.hp.com/us/en/business-services/it-services.html?compURI=1078312**
HPE Advanced Power Manager	The HPE Advanced Power Manager (HPE APM) is an optional rack level solution. HPE APM will automatically discover hardware components and enable bay level power on and off, server metering, aggregate dynamic power capping, configurable power-up dependencies and sequencing, consolidated Ethernet access to all resident iLOs, and asset management capabilities. HPE APM features rack level event logging, RADIUS authentication, integrated serial concentrator, up to 11 local user accounts, read only service port, and supports SNMP, SSH, Syslogd, telnet.

Service and Support

Service and Support	**The XL230a tray is part of the HPE Apollo a6000 chassis. Support for this tray needs to be purchased at a chassis level. Please refer to HPE Apollo a6000 Chassis quick spec documentation for details.**

HPE Technology Services for Apollo Systems

HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to Hewlett Packard Enterprise to help prevent problems and solve issues faster. Our support technology lets you to tap into the knowledge of millions of devices and thousands of experts to stay informed and in control, anywhere, any time.

Protect your business beyond warranty with HPE Care Pack Services

HPE Care Pack Services enable you to order the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement for the term you select.

Get connected to Hewlett Packard Enterprise to improve your support experience	Connecting products to Hewlett Packard Enterprise will help prevent problems with 24x7monitoring, prefailure alerts, automatic call logging, and parts dispatch. With Connected products, you can have a dashboard to manage your IT anywhere, anytime, from any device
HPE Support Center	Personalized online support portal with access to information, tools and experts to support Hewlett Packard Enterprise business products. Submit support cases online, chat with Hewlett Packard Enterprise experts, access support resources or collaborate with peers. Learn more **http://www.hpe.com/go/hpsc**

The HPE Support Center Mobile App* allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalize IT support anywhere, anytime. HPE Insight Remote Support and HPE Support Center are available at no additional cost with a Hewlett Packard Enterprise warranty, HPE Care Pack or Hewlett Packard Enterprise contractual support agreement.

NOTE:; *The HPE Support Center Mobile App is subject to local availability.*

Parts and Materials	Hewlett Packard Enterprise will provide Hewlett Packard Enterprise-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

For more information	To learn more on HPE ProLiant servers, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: **http://www.hpe.com/services/proliant** To find the full list of Care Pack SKUs for the HPE Apollo family of products, go to: **http://hpe.com/go/lookuptool** and in step 2 select HPE ProLiant, then select HPE Apollo family.

Configuration Information – Factory Integrated Models

NOTE: 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 Hewlett Packard Enterprise approved configurator. Contact your local sales representative for information on configurable product offerings and requirements.
NOTE: FIO indicates that this option is only available as a factory installable option.
NOTE: HPE Apollo a6000 Chassis and HPE Apollo 6000 Power Shelf are required to support the server. Refer to their QuickSpecs for additional information.
HPE Apollo 6000 Power Shelf
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04293375
HPE Apollo a6000 Chassis
https://www.hpe.com/h20195/v2/gethtml.aspx?docname=c04293373

Step 1: Base Configuration (Choose one of the CTO Models below)

HPE CTO Model	HPE ProLiant XL230a Gen9 Single-width 2P 1.0m Rear-cabled Hot Plug Drives 12G Compute Tray	789917-B21

Step 2: Choose Required Options (only one from each category unless otherwise noted)

HPE Processors	**NOTE:** Select one "-L21" processor and a matching "-B21" processor for each Tray.	
	E5-2600v4 series Processors	
	HPE XL2x0 Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W) FIO Processor Kit	825934-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2603v4 (1.7GHz/6-core/15MB/85W) Processor Kit	825934-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) FIO Processor Kit	825936-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2609v4 (1.7GHz/8-core/20MB/85W) Processor Kit	825936-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) FIO Processor Kit	825938-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2620v4 (2.1GHz/8-core/20MB/85W) Processor Kit	825938-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) FIO Processor Kit	825940-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2623v4 (2.6GHz/4-core/10MB/85W) Processor Kit	825940-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2630 v4 (2.2GHz/10-core/25MB/85W) FIO Processor Kit	825944-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2630 v4 (2.2GHz/10-core/25MB/85W) Processor Kit	825944-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) FIO Processor Kit	825948-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2640v4 (2.4GHz/10-core/25MB/90W) Processor Kit	825948-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	825950-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2643v4 (3.4GHz/6-core/20MB/135W) Processor Kit	825950-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) FIO Processor Kit	825964-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W) Processor Kit	825964-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) FIO Processor Kit	825966-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) Processor Kit	825966-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2667 v4 (3.2GHz/8-core/25MB/135W) FIO Processor Kit	830263-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2667 v4 (3.2GHz/8-core/25MB/135W) Processor Kit	830263-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) FIO Processor Kit	825976-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2690v4 (2.6GHz/14-core/35MB/135W) Processor Kit	825976-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2697Av4 (2.6GHz/16-core/40MB/145W) FIO Processor Kit	841179-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2697Av4 (2.6GHz/16-core/40MB/145W) Processor Kit	841179-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) FIO Processor Kit	825980-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W) Processor Kit	825980-B21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) FIO Processor Kit	833646-L21
	HPE XL2x0 Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W) Processor Kit	833646-B21
	E5-2600v3 series Processors	
	HPE XL2x0 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) FIO Processor Kit	768560-L21

Configuration Information – Factory Integrated Models

HPE XL2x0 Gen9 Intel® Xeon® E5-2603v3 (1.6GHz/6-core/15MB/85W) Processor Kit	768560-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) FIO Processor Kit	768582-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2609v3 (1.9GHz/6-core/15MB/85W) Processor Kit	768582-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) FIO Processor Kit	768586-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2620v3 (2.4GHz/6-core/15MB/85W) Processor Kit	768586-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) FIO Processor Kit	768588-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2630v3 (2.4GHz/8-core/20MB/85W) Processor Kit	768588-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) FIO Processor Kit	768614-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2630Lv3 (1.8GHz/8-core/20MB/55W) Processor Kit	768614-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) FIO Processor Kit	799861-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2637v3 (3.5GHz/4-core/15MB/135W) Processor Kit	799861-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) FIO Processor Kit	768590-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2640v3 (2.6GHz/8-core/20MB/90W) Processor Kit	768590-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) FIO Processor Kit	799859-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2643v3 (3.4GHz/6-core/20MB/135W) Processor Kit	799859-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) FIO Processor Kit	768592-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2650v3 (2.3GHz/10-core/25MB/105W) Processor Kit	768592-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) FIO Processor Kit	768618-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2650Lv3 (1.8GHz/12-core/30MB/65W) Processor Kit	768618-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) FIO Processor Kit	768594-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2660v3 (2.6GHz/10-core/25MB/105W) Processor Kit	768594-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) FIO Processor Kit	768596-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2670v3 (2.3GHz/12-core/30MB/120W) Processor Kit	768596-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) FIO Processor Kit	768598-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2680v3 (2.5GHz/12-core/30MB/120W) Processor Kit	768598-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) FIO Processor Kit	768602-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2683v3 (2GHz/14-core/35MB/120W) Processor Kit	768602-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) FIO Processor Kit	768600-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2690v3 (2.6GHz/12-core/30MB/135W) Processor Kit	768600-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) FIO Processor Kit	768604-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2695v3 (2.3GHz/14-core/35MB/120W) Processor Kit	768604-B21
HPE XL2x0 Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) Processor Kit	790710-L21
HPE XL2x0 Gen9 Intel® Xeon® E5-2698v3 (2.3GHz/16-core/40MB/135W) Processor Kit	790710-B21

NOTE: All processors within the server must be identical; two processors required

NOTE: The letter "L" following the processor model number denotes lower wattage.

NOTE: Processors E5-2637, E5-2643, E5-2667 may limit the system's inlet ambient support to 25°C or lower.

NOTE: The processor model as well as the memory configuration determines the maximum speed memory can operate. Please see the see the "Memory" section later in this document.

NOTE: For the maximum supported memory speeds for each processor listed above, please reference the 'Memory Speed by Processor Model' table in the Memory section of the QuickSpecs.

NOTE: DDR4 speed is the maximum memory speed of the processor. Actual memory speed may depend on the quantity and type of DIMMs installed.

NOTE: HT indicates that the processor model supports Intel® Hyper-Threading Technology.

NOTE: All processors support Intel® Hyper-Threading and Intel® Turbo Boost Technologies except the E5-2603 v3/v4 and E5-2609 v3/v4.

NOTE: Turbo indicates the maximum potential frequency when using Intel® Turbo Boost Technology. The frequency boost increment is dependent on the processor SKU and the number of active cores. In general,

Configuration Information – Factory Integrated Models

a higher boost increment is obtained when fewer cores are active.

NOTE: For the Intel® C610 Chipset E5-2600 v3/v4 Series, the letter preceding the model number indicates the Product Line (E3, E5, E7); 2600x, 2 = number of CPUs in a Node, 6 is socket/segment designation, 00 = Processor SKU, and x = L for low power SKUs.

HPE Memory	**Registered DIMMs (RDIMMs) – DDR4-2400**	
	HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843311-B21
	HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21
	HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843313-B21
	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843315-B21
	Load Reduced DIMMs (LRDIMMs) –DDR4-2400	
	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805353-B21
	HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805358-B21
	HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-20-18-18 Load Reduced Memory Kit	809208-B21
	Registered DIMMs (RDIMMs) – DDR4-2133	
	HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
	HPE 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
	HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	810744-B21
	HPE 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21
	Load Reduced DIMMs (LRDIMMs) – DDR4-2133	
	HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
	HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
	HPE 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726724-B21

NOTE: Minimum 2 DIMMs are required; 1 DIMM per processor.
NOTE: A maximum of 16 DIMMs are supported per XL230a server tray (or 8 DIMMs max per processor).
NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.
NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at:
http://www8.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400 Mhz, 2133MHz, 1866MHz, or 1600MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: **http://h22195.www2.hpe.com/MemoryTool/Home/Legal**

HPE Riser Cards	HP Apollo 6000 PCIe x16 Riser Kit	788126-B21
	NOTE: This riser includes one slot: PCIe 3.0 x16, Low Profile, Internal only.	
	HP Apollo 6000 Dual 1GbE 364i FIO Kit	757404-B21
	NOTE: This riser does not include any slot.	
	HP Apollo 6000 Dual FlexibleLOM Riser	757401-B21
	NOTE: This riser includes two FlexibleLOM slots.	
	HP Apollo 6000 PCIe/FlexLOM Riser FIO Kit	804165-B21
	NOTE: This riser includes two slots: one FlexibleLOM slot and one PCIe 3.0 x8, Low Profile.	
HPE Networking	HPE Ethernet 10G 2-port 562SFP+ Adapter	727055-B21
	HP Ethernet 10G 2-port 546SFP+ Adapter	779793-B21
	HP Ethernet 10/25G 2-port 640SFP28 Adapter	817753-B21
HPE Storage Controller Cables	**Storage Controller Cable Kits (for 12G Hot Plug server tray)**	
	HPE XL230a Mini-SAS B140i 12G FIO Cable	794945-B21
	HPE XL230a Mini-SAS H240 12G Cable	792551-B21
	HPE XL230a Mini-SAS P440 12G Cable	792549-B21

Step 3: Choose Additional Factory Integration Only Options (only one from each list unless otherwise noted)

Configuration Information – Factory Integrated Models

HPE Storage Controllers	**Embedded SATA Controller**	
	HPE FIO Enable Smart Array B140i Setting	784308-B21
	NOTE: Embedded SATA controller operates in AHCI mode by default. Select this option to enable RAID and hot-plug features (Embedded SATA controller will operate in Dynamic Smart Array B140i mode).	
	Host Bus Adapter	
	HPE H240 12Gb 2-ports Int FIO Smart Host Bus Adapter	761873-B21
	Smart Array Controller	
	HPE XL2xx Smart Array P440/4G 12W FIO Kit	786087-B21
BIOS Mode	HP Legacy FIO Mode Setting	758959-B22
HP Controller State	HP Mfg FIO Enable HBA Mode Setting	792962-B21
	NOTE: If selected when HP H240 Smart Host Bus Adapter is used as the primary controller, then RAID is not allowed.	
	HP FIO Enable B140i Setting	784308-B21
HPE Insight Software	**HPE iLO Advanced**	
	HP Insight Control including 1yr 24x7 support ProLiant ML/DL/BL-bundle Single Server FIO License	C6N36A
	HP Insight Control including 1yr 24x7 support ProLiant ML/DL/BL-bundle Single Server FIO E-LTU	C6N36ABE
HPE Converged Infrastructure Software	**HPE OneView Advanced (with HPE iLO Advanced)**	
	HP OneView for ProLiant DL Server incl 3yr 24x7 Supp FIO Bundle Physical 1 Svr Lic	E5Y43A
	HPE OneView Advanced (without HPE iLO Advanced)	
	HP OneView w/o iLO including 3yr 24x7 Support FIO 1 Server LTU	P8B31A

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

Core Options

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

HPE Hard Drive	**12G SAS 10K Hot Plug SFF (2.5-inch) Enterprise Hard Drive**	
	3yr Warranty Hard Drives	
	HPE 1.2TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	781518-B21
	HPE 900GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	785069-B21
	HPE 600GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	781516-B21
	HPE 300GB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	785067-B21
	12G SAS 15K Hot Plug SFF (2.5-inch) Enterprise Hard Drive	
	3yr Warranty Hard Drives	
	HPE 600GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759212-B21
	HPE 300GB 12G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	759208-B21
	12G SAS Hot Plug SFF (2.5-inch) Hard Drive	
	1yr Warranty Hard Drive	
	HPE 2TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765466-B21
	HPE 1TB 12G SAS 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765464-B21
	HPE 1.8TB 12G SAS 10K rpm SFF (2.5-inch) SC Enterprise 512e 3yr Warranty Hard Drive	791034-B21
	12G SAS Hot Plug SFF (2.5-inch) Mainstream Endurance Enterprise Solid State Drive	
	3yr Warranty H2 Solid State Drives	
	HPE 1.6TB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779176-B21
	HPE 800GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779172-B21
	HPE 400GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779168-B21
	HPE 200GB 12G SAS Mainstream Endurance SFF 2.5-in ENT Mainstream SC 3yr Wty H2 Solid State Drive	779164-B21
	12G SAS Hot Plug SFF (2.5-inch) Write Intensive Solid State Drive	
	3yr Warranty Solid State Drives	
	HPE 800GB 12G SAS Write Intensive-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846430-B21
	HPE 800GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802586-B21
	HPE 1.6TB 12G SAS Write Intensive-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846432-B21
	HPE 400GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802582-B21
	HPE 200GB 12G SAS Write Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802578-B21
	12G SAS Hot Plug SFF (2.5-inch) Read Intensive Solid State Drive	
	3yr Warranty Solid State Drives	
	HPE 1.92TB 12G SAS Read Intensive SFF 2.5-in SC 3yr Wty Solid State Drive	802891-B21
	HPE 3.84TB 12G SAS Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816576-B21
	12G SAS Hot Plug SFF (2.5-inch) Mixed Use Solid State Drive	
	3yr Warranty Solid State Drives	
	HPE 800GB 12G SAS Mixed Use-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846434-B21
	HPE 1.6TB 12G SAS Mixed Use-1 SFF (2.5in) SC 3yr Wty Solid State Drive	846436-B21
	HPE 3.2TB 12G SAS Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	822567-B21
	12G SAS Hot Plug SFF (2.5-inch) Midline Hard Drive	
	1yr Warranty Hard Drives	
	HPE 1TB 12G SAS 7.2K rpm SFF (2.5in) SC Midline 1yr Warranty Hard Drive	832514-B21
	HPE 1TB 6G SATA 7.2k rpm SFF 2.5-inch Tool-less Non-hot Plug Midline 1yr Warranty Hard Drive	751969-B21
	HPE 500GB 6G SATA 7.2K rpm SFF 2.5-inch Tool-less Non-hot Plug Midline 1yr Warranty Hard Drive	751967-B21

Core Options

6G SAS Hot Plug SFF (2.5-inch) Midline Hard Drive
1yr Warranty Hard Drives
HPE 500GB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652745-B21
HPE 1TB 6G SAS 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	652749-B21

6G SAS Hot Plug SFF (2.5-inch) Enterprise Hard Drive
1yr Warranty Hard Drives
HPE 900GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652589-B21
HPE 600GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652583-B21
HPE 450GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652572-B21
HPE 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652564-B21
HPE 300GB 6G SAS 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive	652611-B21

6G SATA Hot Plug SFF (2.5-inch) Midline Hard Drive
1yr Warranty Hard Drives
HPE 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655710-B21
HPE 500GB 6G SATA 7.2K rpm SFF (2.5-inch) SC Midline 1yr Warranty Hard Drive	655708-B21

6G SATA Hot Plug SFF (2.5-inch) Hard Drive
1yr Warranty Hard Drives
HPE 2TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765455-B21
HPE 1TB 6G SATA 7.2K rpm SFF (2.5-inch) SC 512e 1yr Warranty Hard Drive	765453-B21

6G SATA Hot Plug SFF (2.5-inch) Mainstream Endurance Enterprise Solid State Drive
3yr Warranty Solid State Drives
HPE 800GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691868-B21
HPE 400GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691866-B21
HPE 100GB 6G SATA Mainstream Endurance SFF 2.5-in SC Enterprise Mainstream 3yr Wty Solid State Drive	691862-B21

6G SATA Hot Plug SFF (2.5-inch) Value Endurance Enterprise Solid State Drive
3yr Warranty Solid State Drives
HPE 120GB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816879-B21
HPE 3.84TB 6G SATA Read Intensive-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816929-B21
HPE 480GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816985-B21
HPE 960GB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	816995-B21
HPE 1.92TB 6G SATA Mixed Use-3 SFF 2.5-in SC 3yr Wty Solid State Drive	817011-B21
HPE 600GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Value 3yr Wty Solid State Drive	739898-B21

6G SATA Hot Plug SFF (2.5-inch) Read Intensive Solid State Drive
3yr Warranty Solid State Drives
HPE 120GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838404-B21
HPE 240GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838406-B21
HPE 480GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838408-B21
HPE 960GB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838410-B21
HPE 1.92TB 6G SATA Read Intensive-1 SFF 2.5-in SC 3yr Wty Solid State Drive	838412-B21
HPE 80GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804575-B21
HPE 120GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804581-B21
HPE 240GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804587-B21
HPE 480GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804593-B21
HPE 800GB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804599-B21
HPE 1.6TB 6G SATA Read Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804605-B21

6G SATA Hot Plug SFF (2.5-inch) Mixed Use Solid State Drive
3yr Warranty Solid State Drives
HPE 1.6TB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804631-B21
HPE 800GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804625-B21
HPE 480GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	832414-B21
HPE 200GB 6G SATA Mixed Use-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804613-B21

Core Options

6G SATA Hot Plug SFF (2.5-inch) Write Intensive Solid State Drive
3yr Warranty Solid State Drives

HPE 1.2TB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804677-B21
HPE 800GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804671-B21
HPE 400GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804665-B21
HPE 200GB 6G SATA Write Intensive-2 SFF 2.5-in SC 3yr Wty Solid State Drive	804639-B21

NOTE: Hard drives have either a one year or three year warranty.
NOTE: The hard drive options are not required when configuring a Drive-less Model.
NOTE: The H240 controller is required when ordering SAS drives
NOTE: The components of a storage subsystem (e.g. the drive, the HBA/controller, firmware, and the server backplane) should operate at the same data transfer rate or the system bandwidth will be negotiated down to an acceptable level for all components.

HPE PCIe Workload Accelerators

HPE 3.2TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763838-B21
HPE 1.6TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763836-B21
HPE 2.6TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775670-B21
HPE 1.3TB HH/HL Value Endurance (VE) PCIe Workload Accelerator	763834-B21
HPE 1.0TB HH/HL Light Endurance (LE) PCIe Workload Accelerator	775666-B21

High Performance Clusters

HPE Cluster Management Utility

HPE Insight Cluster Management Utility 1yr 24x7 Flexible LTU	QL803B
HPE Insight Cluster Management Utility 3yr 24x7 Flexible LTU	BD476A

NOTE: These part numbers can be used to purchase one certificate for multiple licenses and support with a single activation key. Each license is for one node (server). Customer will receive a printed end user license agreement and license entitlement certificate via physical shipment. The license entitlement certificate must be redeemed online in order to obtain a license key. Customer will also receive a support agreement.

HPE Insight Cluster Management Utility Media	BD477A

NOTE: For additional license kits please see the QuickSpecs at:
http://h18004.www1.hpe.com/products/QuickSpecs/12612_div/12612_div.html

HPE Networking

Ethernet Options

HPE Ethernet 1Gb 4-port 331FLR Adapter	629135-B22
HPE Ethernet 1Gb 4-port 366FLR Adapter	665240-B21
HPE FlexFabric 10Gb 2-port 533FLR-T Adapter	700759-B21
HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter	700751-B21
HPE Ethernet 10Gb 2-port 546FLR-SFP+ Adapter	779799-B21
HPE FlexFabric 10Gb 2-port 556FLR-SFP+ Adapter	727060-B21
HPE Ethernet 10Gb 2-port 560FLR-SFP+ Adapter	665243-B21
HPE Ethernet 10Gb 2-port 561FLR-T Adapter	700699-B21
HPE Ethernet 10Gb 2-port 562FLR-SFP+ Adapter	727054-B21
HPE Ethernet 10Gb 2-port 546SFP+ Adapter	779793-B21
HPE Ethernet 10Gb 2-port 562SFP+ Adapter	727055-B21
HPE Ethernet 10/25Gb 2-port 640FLR-SFP28 Adapter	817749-B21
HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter	817753-B21

InfiniBand Options

HPE InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+FLR-QSFP Adapter	764285-B21
HPE InfiniBand QDR/Ethernet 10Gb 2-port 544+FLR-QSFP Adapter	764286-B21
HPE InfiniBand FDR 2P 545FLR-QSFP Adptr	N1C08A
HPE InfiniBand EDR/Ethernet 100Gb 1-port 840QSFP28 Adapter	825110-B21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter	825111-B21
QLogic InfiniBand 4X QDR PCI-E G2 Dual Port HCA	583211-B21

Core Options

	Intel Networking Options	
	HPE 100Gb 1-port OP101 QSFP28 x16 PCIe Gen3 with Intel® Omni-Path Architecture Adapter	**829335-B21**
	HPE 100Gb 1-port OP101 QSFP28 x8 PCIe Gen3 with Intel® Omni-Path Architecture Adapter	**829334-B21**
HPE Rack Options	**HPE USB BFR with PVC Free Keyboard/Mouse Kit**	
	HPE USB BFR with PVC Free US Keyboard/Mouse Kit	631341-B21
	NOTE: Please see the QuickSpecs for Technical Specifications and additional information: **http://h18000.www1.hpe.com/products/QuickSpecs/13972_div/13972_div.html**	
Security Hardware	HPE Trusted Platform Module Option	488069-B21
	HPE Trusted Platform Module 2.0 Kit	745823-B21

Additional Options

|		
HPE Storage Controllers	**Storage Controller Cable Kits (for 12G Hot Plug server tray)**	
	HP XL230a Mini-SAS H240 12G Cable	792551-B21
	HP XL230a Mini-SAS P440 12G Cable	792549-B21
	Host Bus Adapter	
	HP H240 12Gb 2-ports Int Smart Host Bus Adapter	726907-B21
	HP H241 12Gb 2-ports Ext Smart Host Bus Adapter	726911-B21
	NOTE: The H241 is only supported with the HPE Apollo 6000 PCIe/FlexLOM Riser FIO Kit (804165-B21)	
	Fibre Channel Host Bus Adapter	
	HPE StoreFabric SN1100Q 16Gb Single Port Fibre Channel Host Bus Adapter	P9D93A
	HPE StoreFabric SN1100Q 16Gb Dual Port Fibre Channel Host Bus Adapter	P9D94A
	HPE StoreFabric SN1100E 16Gb Single Port Fibre Channel Host Bus Adapter	C8R38A
	HPE StoreFabric SN1100E 16Gb Dual Port Fibre Channel Host Bus Adapter	C8R39A
	NOTE: Fibre Channel support requires the HPE Apollo 6000 PCIe/FlexLOM Riser FIO Kit (804165-B21)	
	Other Storage Controller Options	
	HP 12W Smart Storage Battery with Plug Connector for BL Servers	782961-B21
SD and USB Key Options	HP 32GB microSDMainstream Flash Media Kit	700139-B21
	HP 8GB microSD EM Flash Media Kit	726116-B21
	HP 36pin Suv Dongle Cord Kit	676277-B21
	HP 8GB US EM Flash Media Kit	737953-B21
	HP Dual 8GB microSD EM USB Kit	741279-B21

HPE Memory

 For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool:
http://h22195.www2.hpe.com/MemoryTool/Home/Legal

Memory Subsystem Architecture

Each Intel® Xeon® E5-2600 v3/v4 family processor socket contains four memory channels that support two DIMMs each for a total of eight (8) DIMM per installed processor or a grand total of sixteen (16) DIMMs for the server. Up to 128GB capacity DIMMs are supported for 2048GB of memory (16 DIMM slots x 128GB per DIMM).

Memory
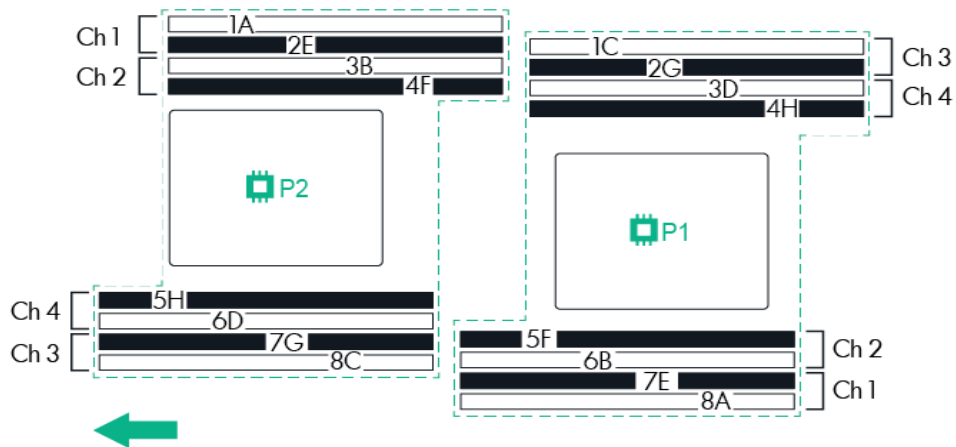
The arrow indicates the front of the server.

General Memory Population Rules and Guidelines:
- White DIMM slots denote the first slot of a channel. For 1 DPC (DIMM per channel) populate white slots only. This server supports up to 2 DIMMs per channel.
- To maximize performance, it is recommended to balance the total memory capacity between the installed processors and load the channels similarly whenever possible: processor 1 (8A), processor 2 (1A), processor 1 (6B), processor 2 (3B), processor 1(1C) processor 2 (8C), processor 1 (3D), processor 2 (6D), processor 1 (7E), processor 2 (2E) in that order.
- There are four channels per processor with two DIMM slots per channel.
- Do not mix RDIMMs and LRDIMMs
- No support for Non-ECC UDIMMs
- Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- To realize the performance memory capabilities listed in this document, HPE SmartMemory is required. For additional information, please see the HPE SmartMemory QuickSpecs at **http://h18000.www1.hpe.com/products/QuickSpecs/14225/14225.html**.
- For memory population rules and additional memory guidelines, please see the HPE ProLiant XL230 Gen9 user guide at **http://www.hpe.com/support**.

Memory

Supported Memory Bandwidth with Intel Xeon E5-2600 V4 Series Processor Family

Memory Bandwidth and capacity							
DIMM Type	Registered DIMMs (RDIMMs)				Load Reduced (LRDIMMs)		
HPE SKU	843311-B21	843313-B21	836220-B21	843315-B21	805353-B21	805358-B21	809208-B21
DIMM Rank	1R	1R	2R	2R	2R	4R	8R
DIMM Capacity	8GB	16GB	16GB	32GB	32GB	64GB	128GB
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
DRAM Depth	1G	2G	1G	2G	2G	2G	2G
DRAM Width	x8	x4	X4	X4	X4	X4	X4
DRAM Density	8Gb	8Gb	4Gb	8Gb	8Gb	8Gb	8Gb
CAS Latency	17-17-17	17-17-17	17-17-17	17-17-17	17-17-17	17-17-17	20-18-18
DIMM Native Speed	2400	2400	2400	2400	2400	2400	2400
Slots	16	16	16	16	16	16	16
Max Capacity (GB)	128	256	256	512	512	1024	2048
Populated DIMM Speed							
1 DIMM per channel	2400	2400	2400	2400	2400	2400	2400
2 DIMM per channel	2133	2133	2133	2133	2400	2400	2400

Supported Memory Bandwidth with Intel Xeon E5-2600 V3 Series Processor Family

Memory Bandwidth and capacity							
DIMM Type	Registered DIMMs (RDIMMs)				Load Reduced (LRDIMMs)		
HPE SKU	726718-B21	759934-B21	810744-B21	728629-B21	726720-B21	726722-B21	726724-B21
DIMM Rank	1R	2R	2R	2R	2R	4R	4R
DIMM Capacity	8GB	8GB	16GB	32GB	16GB	32GB	64GB
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
DRAM Depth	1G	512M	1G	1G	2G	2G	2G
DRAM Width	X4	X8	X4	X4	X4	X4	X4
DRAM Density	4Gb	4Gb	4Gb	4Gb	8Gb	8Gb	8Gb
CAS Latency	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15	15-15-15
DIMM Native Speed	2133	2133	2133	2133	2133	2133	2133
Slots	16	16	16	16	16	16	16
Max Capacity (GB)	128	128	256	512	256	512	1024
Populated DIMM Speed							
1 DIMM per channel	2133	2133	2133	2133	2133	2133	2133
2 DIMM per channel	2133	2133	2133	2133	2133	2133	2133

Memory Speed by E5-2600 v4 Series Processor Model

Memory

Processor Models	Supported Memory Speeds
E5-2643v4, E5-2650v4, E5-2660v4, E5-2667v4, E5-2680v4, E5-2683v4 E5-2690v4, E5-2695v4, E5-2697v4, E5-2697Av4, E5-2698v4, E5-2699v4	2400MHz
E5-2620v4, E5-2623v4, E5-2630v4, E5-2640v4	2133MHz
E5-2603 v4, E5-2609 v4	1866MHz

Memory Speed by E5-2600 v3 Series Processor Model

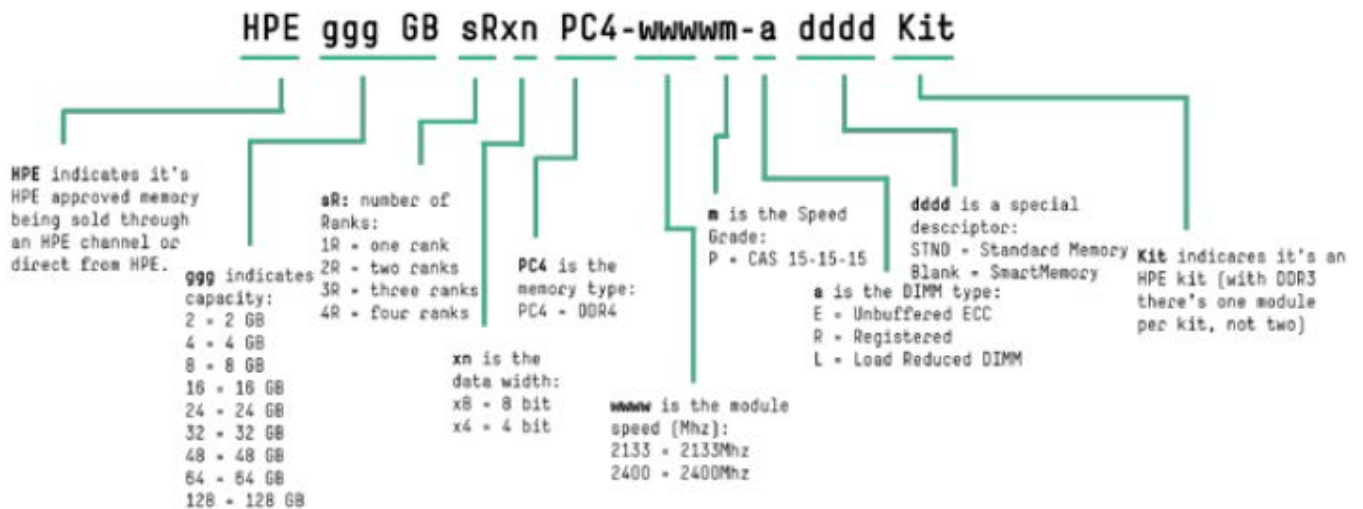| Processor Models	Supported Memory Speeds
E5-2637v3, E5-2643v3, E5-2650v3, E5-2650Lv3, E5-2660v3, E5-2670v3, E5-2670v3, E5-2680v3, E5-2683v3, E5-2690v3, E5-2695v3, E5-2698v3	2133MHz
E5-2620v3, E5-2630v3, E5-2630Lv3, E5-2640v3	1866MHz
E5-2603v3, E5-2609v3	1600MHz

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

- 2GB = 2,048MB
- 4GB = 4,096MB
- 8GB = 8,192MB
- 16GB = 16,384MB
- 32GB = 32,768MB
- 64GB = 65,536MB
- 128GB = 131,072MB

Memory options part number decoder

DDR4 Product Description Format (Short Name)

Example: HPE 8 GB 1R×4 PC4-2133P-R STND Kit

HPE ggg GB sRxn PC4-wwwwm-a dddd Kit

HPE indicates it's HPE approved memory being sold through an HPE channel or direct from HPE.

ggg indicates capacity:
2 = 2 GB
4 = 4 GB
8 = 8 GB
16 = 16 GB
24 = 24 GB
32 = 32 GB
48 = 48 GB
64 = 64 GB
128 = 128 GB

sR: number of Ranks:
1R = one rank
2R = two ranks
3R = three ranks
4R = four ranks

xn is the data width:
x8 = 8 bit
x4 = 4 bit

PC4 is the memory type:
PC4 = DDR4

wwww is the module speed (Mhz):
2133 = 2133Mhz
2400 = 2400Mhz

m is the Speed Grade:
P = CAS 15-15-15

a is the DIMM type:
E = Unbuffered ECC
R = Registered
L = Load Reduced DIMM

dddd is a special descriptor:
STND = Standard Memory
Blank = SmartMemory

Kit indicates it's an HPE kit (with DDR3 there's one module per kit, not two)

HPE 8 GB 1 R×4 PC4-2133P-R STND Kit indicates an HPE Standard Memory DIMM with a 8 GB capacity, single rank, a data width of 4, memory type of DDR4, 2133 registered, 15-15-15 latency, and an HPE kit.

Following are memory options available from HPE:

HPE Memory	Registered DIMMs (RDIMMs) – DDR4-2400	
	HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843311-B21
	HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21

Memory

HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843313-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	843315-B21

Load Reduced DIMMs (LRDIMMs) –DDR4-2400

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805353-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Reduced Memory Kit	805358-B21
HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-20-18-18 Load Reduced Memory Kit	809208-B21

Registered DIMMs (RDIMMs) – DDR4-2133

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	810744-B21
HPE 8GB (1x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21

Load Reduced DIMMs (LRDIMMs) – DDR4-2133

HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726722-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726720-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load Reduced Memory Kit	726724-B21

NOTE: Minimum of 2 DIMMs are required per server.

NOTE: A maximum of 16 DIMMs are supported per XL230a server tray (or 8 DIMMs max per processor).

NOTE: LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a server.

NOTE: HPE memory from previous generation servers (DDR3) is not compatible with this server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HPE SmartMemory QuickSpecs at: http://www8.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111535

NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2400MHz, 2133MHz or 1866MHz. Please see Memory Population Table or the Online Memory Configuration Tool at: **http://h22195.www2.hpe.com/MemoryTool/Home/Legal**

Technical Specifications

System Unit			
	Server Dimensions (L x W x D)	1.70 x 8.33 x 27.87 in (4.33 x 21.15 x 70.79 cm)	
	Shipping Dimensions (L x W x D)	37.63 x 15.13 x 9 in (95.5 x 38.4 x 22.8 cm)	
	Weight (approximate)	Maximum (four hard drives and two processors installed)	15.0 lb (6.8 kg)
	System Inlet Temperature	Standard Operating Support	10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed.
		Extended Ambient Operating Support	System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F). 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.hp.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.hp.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	Minimum to be the higher (more moisture) of -12°C (10.4°F) dew point or 8% relative humidity. Maximum to be the lower (less moisture) of 24°C (75.2°F) dew point or 90% relative humidity.
		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).

Technical Specifications

Acoustic Noise

Listed are the declared A-Weighted sound power levels (LWAd) and measured average bystander position A-Weighted sound pressure levels (LpAm) when the product is operating in a 23°C ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109). The listed sound levels apply to standard shipping configurations. .

Configuration SKU	Entry	Base	Performance
Idle			
LWAd	6.9 B	6.9 B	6.9 B
LpAm	51 dBA	51 dBA	51 dBA
Operating			
LWAd	8.0 B	8.3 B	8.7 B
LpAm	62 dBA	66 dBA	72 dBA

NOTE: Entry- CPU*2(E5-2683v3, 120W, 14c), DDR4 DIMM*4(8GB 1Rx4), HDD*1(900GB 6G SAS 10K 2.5in ENT) 2
NOTE: Base- CPU*2(E5-2683v3, 120W, 14c), DDR4 DIMM*8(8GB 1Rx4), HDD*2(900GB 6G SAS 10K 2.5in ENT) 3
NOTE: Performance- CPU*2(E5-2690v3, 135W, 12c), DDR4 DIMM*16(16GB 2Rx4), HDD*4(900GB 6G SAS 10K 2.5in ENT)
NOTE: Values are subject to change without notification and are for reference only.
NOTE: Performance of system, options, and ancillary equipment will vary depending on the system configuration.
NOTE: Levels presented do not account for non-Hewlett Packard Enterprise installed hardware.

Emissions Classification (EMC)

FCC Rating   Class A

Normative Standards   CISPR 22; EN55022; EN55024; FCC CFR 47, Pt 15; ICES-003; CNS13438; GB9254; K22;K24; EN 61000-3-2; EN 61000-3-3; EN 60950-1; IEC 60950-1

NOTE: Product conformance to cited product specifications is based on sample (type) testing, evaluation, or assessment. This product or family of products is eligible to bear the appropriate compliance logos and statements.

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life Hewlett Packard Enterprise product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to: **http://www.hpe.com/go/green** To recycle your product, please go to: **http://www.hpe.com/go/green** or contact your nearest Hewlett Packard Enterprise sales office. 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 at: **http://www.hpe.com/go/green** These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise EM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
13-Feb-2017	From version 11 to 12	Update	Update sections throughtout the QuickSpecs
4-Nov-2016	From version 10 to 11	Updated	Remove some of the HDD SKUs
15-Aug-2016	From version 9 to 10	Updated	Update the configuration and information section
31-Mar-2016	From version 8 to 9	Changed	Change sections and update info troughout the QS , remove obsolete SKU's
11-Dec-2015	From version 7 to 8	Updated	Remove obsolete SKU´s
17-Aug-2015	From version 6 to 7	Updated	Update processors and Hard Drives
1-Jun-2015	From version 5 to 6	Changed	Updates made throughout the QS
17-Apr-2015	From version 4 to 5	Changed	Updates throughout the QS, correct errors.
9-Feb-2015	From version 3 to 4	Updates	Updates to align with XL250a.
1-Dec-2014	From version 2 to 3	Changed	Changes made throughout the document
1-Nov-2014	From version 1 to 2	Changed	Changes made in Configuration section – processors.
9-Sept-2014	Version 1	Created	Crete QuickSpecs for HPE ProLiant XL230a Gen9 Server

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