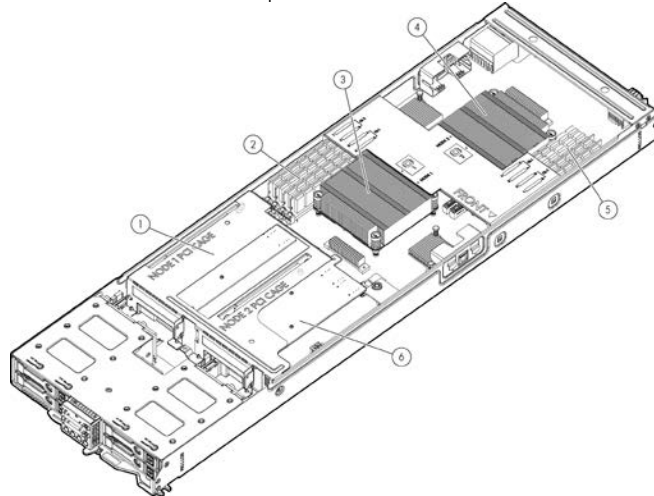


### Standard Features

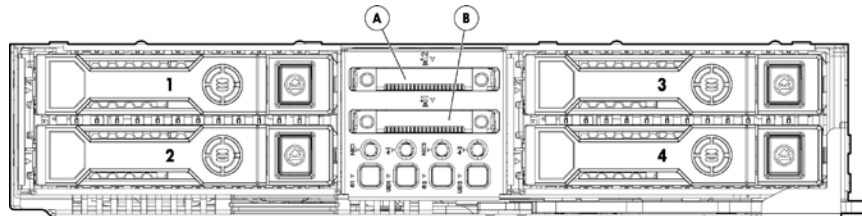
#### HPE ProLiant XL220a Gen8 v2 Server

The HPE Apollo 6000 System is designed for air-cooled high-performance computing (HPC), providing more performance, using less energy at a lower cost than a competing blade server. For single threaded workloads, the HPE ProLiant XL220a Gen8 v2 Server has two single socket servers in each front accessible server tray. Both of the processors are Intel® Xeon® E3-1200 v3 processors and each one has four dedicated DDR3 memory slots, each capable of holding up to 8GB UDIMMs, two Hot Plug Small Form Factor (SFF) drives, and one Serial/USB/Video (SUV) port dedicated to it.



#### Item Description

1. Node 1 PCIe Riser Board Connector
2. Node 1 DIMM Slots
3. Node 1 Processor (Intel E3-1200v3 series)
4. Node 2 Processors (Intel E3-1200v3 series)
5. Node 2 DIMM Slots
6. Node 2 PCIe Riser Board Connector



#### Item Description

1. Node 1 SFF Storage (1 of 2)
2. Node 1 SFF Storage (2 of 2)
3. Node 2 SFF Storage (1 of 2)
4. Node 2 SFF Storage (2 of 2)
- A. Serial/USB/Video (SUV) Connector (Node 1)
- B. Serial/USB/Video (SUV) Connector (Node 2)

**NOTE:** For the Standard Features shipped in the Factory Integrated Models, please see the "Configuration Information - Factory Integrated Models" section.

## Standard Features

### Processor

One of the following depending on Model

#### Four-core Processors

Intel® Xeon® Processor E3-1281 v3 (3.7GHz/4-core/8MB/HT/80W)  
 Intel® Xeon® Processor E3-1271 v3 (3.6GHz/4-core/8MB/HT/80W)  
 Intel® Xeon® Processor E3-1241 v3 (3.5GHz/4-core/8MB/HT/80W)  
 Intel® Xeon® Processor E3-1231 v3 (3.4GHz/4-core/8MB/HT/80W)  
 Intel® Xeon® Processor E3-1280 v3 (3.6GHz/4-core/8MB/HT/82W)  
 Intel® Xeon® Processor E3-1270 v3 (3.5GHz/4-core/8MB/HT/80W)  
 Intel® Xeon® Processor E3-1220 v3 (3.1GHz/4-core/8MB/No HT/80W)  
 Intel® Xeon® Processor E3-1265L v3 (2.5GHz/4-core/8MB/HT/45W)

### Cache Memory

8MB (1x8MB) Level 3  
**NOTE:** For Quad-core processors.

### Chipset

Intel® C222 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.hp.com/go/ilo>.

### Memory Protection

Advanced ECC (multi-bit error protection)

### Memory

|                                   |  |
|-----------------------------------|--|
| Type                              | HPE SmartMemory<br>Unbuffered (UDIMM)                    |
| DIMM Slots Available              | 4 DIMM Slots available (2 Channels/ 2 DIMMs per channel) |
| Maximum (UDIMM) (per server tray) | 32GB (4 x 8GB@1600MHz) Unbuffered memory configurations  |

**NOTE:** HPE memory from previous generation servers are not fully compatible with the HPE ProLiant XL220a v2 Gen8 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:  
[http://h18000.www1.hp.com/products/QuickSpecs/14225\\_div/14225\\_div.html](http://h18000.www1.hp.com/products/QuickSpecs/14225_div/14225_div.html).

### Network Controller

HPE Ethernet 10Gb 2P 561FLR-T FIO Adptr  
 HPE 10GbE 2P 560FLR-SFP+ Adptr FIO Kit  
 HPE FlexFabric 10Gb 554FLR-SFP+ FIO Adptr  
 HPE FlexFabric 10Gb 534FLR-SFP+ FIO Adptr  
 HPE FlexFabric 10Gb 2P 533FLR-T FIO Adptr  
 HPE Ethernet 10GbE 530FLR-SFP+ FIO Adptr  
 HPE FlexFabric 10G2P 526FLR-SFP FIO Adptr  
 HPE 1GbE 4-port 366FLR Adapter FIO Kit  
 HPE Ethernet 1GbE 4P 331FLR FIO Adptr  
 HPE Apollo 6000 Dual 1GbE 364i FIO Kit

### Expansion Slots

| Expansion Slot # | Technology | Bus Width* | Connector Width | Form Factor |
|------------------|------------|------------|-----------------|-------------|
| 1                | PCIe 3.0   | x16        | x16             | Low profile |
| 2                | PCIe 3.0   | x8         | N/A             | FlexibleLOM |

\*Indicates the number of physical electrical lanes running to the connector.

## Standard Features

### 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: <http://www.hp.com/support/rbsu>

### Storage Controller

#### Smart Array Controller

HPE Smart Array P430/4G Controller

HPE Smart Array P430/2G Controller

#### Host Bus Adapter

HPE H220 Host Bus Adapter

#### Storage Controller Cable

HPE a6000 Mini-SAS P430 Cbl

HPE a6000 Mini-SAS H220 Cbl

### Internal Storage Devices

|                 |   |
|-----------------|---|
| Diskette Drives | Via USB through the SUV port, external support only |
| Optical Drives  | Via USB through the SUV port, external support only |
| USB             | Via SUV port, external support only                 |
| MicroSD Card    | Internal microSD slot                               |

### Maximum Internal Storage

|                       |        |           |
|-----------------------|--------|-----------|
| Hot Plug SFF SAS      | 2.0TB  | 2 x 1TB   |
| Hot Plug SFF SATA     | 2.0TB  | 2 x 1TB   |
| Hot Plug SFF SATA SSD | 1.6 TB | 2 x 800GB |

### Interfaces

|                |   |
|----------------|---|
| FlexibleLOM    | ProLiant Gen8 servers offer a new networking technology-Flexible Network Technology. The ProLiant XL220a Gen8 v2 Server offers the customer the choice of 1Gigabit, 10Gigabit or FlexibleLOM solutions depending on workload. For further details on the choices, see FlexibleLOM in the Networking Section of this document. |
| KVM            | Serial USB Video Port (SUV)   |
| MicroSD        | 1 (internal)  |
| USB Ports      | 1 (internal)  |
| HPE iLO Remote | Aggregated via HPE Apollo 6000 Chassis  |

## Standard Features

|                         |                         |
|-------------------------|-------------------------|
| Management Network Port |                         |
| Health LED              | 1 front per server node |
| Power                   | 1 front per server node |
| UID                     | 1 front per server node |

### 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 URL: <http://www.hp.com/go/proliant-energy-efficient> or <http://www.hp.com/go/hppoweradvisor>.

**NOTE:** Power Specification and Technical Content for supported power supplies can be found at: <https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111541>

### Operating Systems and Virtualization Software Support for ProLiant Servers

**Microsoft® Windows® Server**  
**Canonical® Ubuntu®**  
**Red Hat Enterprise Linux (RHEL)**  
**SUSE® Linux Enterprise Server (SLES)**  
**VMware®**

**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://www.hp.com/go/ossupport> and our driver download page: <http://www.hp.com/support/XL220aGen8v2>.

### Graphics

Integrated Matrox G200 video standard

- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

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 XL220a Gen8 v2 Server is a single-slot tray for the HPE Apollo a6000 Chassis.

### On System Management

HPE iLO Management

HPE iLO Management is a comprehensive set of embedded management features supporting the complete lifecycle of the server, from initial deployment, through ongoing management, to service alerting and remote support. HPE iLO Management comes standard on all HPE ProLiant Gen8

## Standard Features

servers. The HPE iLO Management portfolio includes:

- **HPE iLO:** The HPE iLO (Integrated Lights-Out) management processor is the core foundation for the HPE iLO Management.
- **HPE Agentless Management:** Provides built in server health monitoring and alerting capability without OS agents, that starts working the moment a power cord and an Ethernet cable are connected.
- **HPE Active Health System:** Always on, continuous monitoring for increased stability and shorter downtimes; 100% configuration history; Health and service alerts and easy export and upload to Service and Support.
- **HPE Intelligent Provisioning:** Lets customers provision and configure a single server without any separate media. No more SmartStart CDs or Smart Update Firmware DVD are needed.
  - To start Intelligent Provisioning:
    - Press the F10 key during the ProLiant Gen8 server boot process (also known as power on self-test or POST).
    - Please go to the Intelligent Provisioning website at: <http://www.hp.com/go/intelligentprovisioning> for additional information and to view usage videos.
    - Use the Service Pack for ProLiant (SPP) at: <http://www.hp.com/go/spp> to get firmware and software updates.
- **HPE iLO Mobile App:** Enables the ability to access, deploy, and manage your server anytime from anywhere from select smartphones and mobile devices. For additional information please visit: <http://www.hp.com/go/ilo/mobileapp>

**NOTE:** For more information, visit: <http://www.hp.com/go/ilo> or HPE iLO Management Engine technologies [whitepaper](#)

### 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 HPE 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 6000 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.

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

## Standard Features

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 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 BladeSystem enclosure components (Onboard Administrator and Virtual Connect). 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 <http://www.hp.com/go/spp/download>. More information can be found: <http://www.hp.com/go/SmartUpdate>, <http://www.hp.com/go/spp> and <http://www.hp.com/go/hpsum>

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### 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

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### 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. 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.hp.com/products/servers/platforms/warranty/index.html>.

## Optional Features

### 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://www.hp.com/go/insightcontrol>.

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 more information about this service, see:

<http://www.hp.com/services/insight>.

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:

<http://www.hp.com/go/iloadvance>.

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 Gen8 SL and BL, DL 160 and HPE Apollo servers. For more information, see: <http://www.hp.com/go/iLO/scale-out>.

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: <http://www.hp.com/go/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. <http://www.hp.com/go/clusters>

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

## Optional Features

|  |  |
|--|--|
| HPE Insight Cluster Management Utility | <p>Hewlett Packard Enterprise when integrated within an HPE cluster. Flexible, validated solutions can be defined with the help of configuration tools. <a href="http://www.hp.com/techservers/clusters/ucp/index.html">http://www.hp.com/techservers/clusters/ucp/index.html</a></p> <p>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. <a href="http://www.hp.com/go/cmu">http://www.hp.com/go/cmu</a></p> |
|--|--|

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### 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://www.hp.com/go/insightonline>

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### 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.



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## Service and Support

### Service and Support

**The XL220a tray is a part of the HPE Apollo a6000 chassis. Support for this tray can be purchased at a chassis level. Please refer to HPE Apollo a6000 chassis quick spec documentation for details.**

### HPE Technology Services for Industry Standard Servers

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.

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### Get connected to Hewlett Packard Enterprise to improve your support experience

Connecting products to Hewlett Packard Enterprise will help prevent problems with 24x7 monitoring, 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.

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### Warranty / Service Coverage

The factory warranty for this product is described earlier in this Quick Spec in the Standard Features section, Warranty. Note the warranty coverage is NBD and requires mandatory Customer Self-service remove and replace activities.

For ProLiant servers and storage systems, the services cover HPE-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction. It does not apply to any exchange of Disk or SSD/Flash Drives that have not failed. SSD/Flash Drives that are specified by Hewlett Packard Enterprise as consumable parts and/or that have exceeded maximum supported lifetime and/or the maximum usage limit as set forth in the manufacturer's operating manual or the technical data sheet are not eligible for the defective media retention service feature option.

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### For more information

To learn more on HPE ProLiant servers and HPE BladeSystem servers, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: <http://www.hp.com/services/proliant>

To find the full list of Care Pack SKUs for the Apollo family of products, go to: <http://hp.com/go/lookuptool> and in step 2 select HPE ProLiant, then select Apollo Series Servers.

## 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 Power Shelf are required to support the server. If you do not already have them, please 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

### Step 2: Choose Required Options

|                                |  |
|--------------------------------|--|
| <b>HPE Memory</b>              | <p><b>NOTE:</b> HPE memory from previous generation servers are not qualified or warranted with this HPE ProLiant Server. HPE SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen8. For additional information, please see the HPE SmartMemory QuickSpecs at: <a href="http://h18000.www1.hp.com/products/QuickSpecs/14225_div/14225_div.html">http://h18000.www1.hp.com/products/QuickSpecs/14225_div/14225_div.html</a></p> <p><b>NOTE:</b> only UDIMMs are supported.</p> <p><b>NOTE:</b> A minimum of two DIMMs is required per server.</p> <p><b>NOTE:</b> DIMMs must be ordered in pair of matching part numbers.</p> <p><b>Unbuffered with ECC DIMMs (UDIMMs)</b></p> <p>HPE 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669324-B21</p> <p>HPE 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit 713979-B21</p> <p>HPE 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647909-B21</p> <p>HPE 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669322-B21</p> <p>HPE 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit 647907-B21</p> <p>HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669320-B21</p> <p>HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit 669320-B21</p> |
| <b>HPE Storage Controllers</b> | <p><b>NOTE:</b> Two controllers of the same part numbers are required.</p> <p>HPE Smart Array P430/4GB FBWC 12Gb 1-port Int SAS Controller 698530-B21</p> <p>HPE Smart Array P430/2GB FBWC 12Gb 1-port Int SAS Controller 698529-B21</p> <p><b>Storage Cables</b></p> <p><b>NOTE:</b> Two cables are required of the same part numbers.</p>  |
| <b>HPE Networking</b>          | <p><b>NOTE:</b> Must select one of the following Network modules</p> <p><b>NOTE:</b> If the Dual FlexibleLOM Riser Kit (757401-B21) is selected, a pair of FlexibleLOM Adapters of matching part numbers must be selected as well.</p> <p>HPE Apollo 6000 Dual Ethernet 1Gb 1-port 364i FIO Kit 757404-B21</p> <p>HPE Apollo 6000 Dual FlexibleLOM Riser Kit 757401-B21</p>  |

### Step 3: Choose Additional Factory Integrated Options

|                       |   |
|-----------------------|---|
| <b>HPE Networking</b> | <p><b>FlexibleLOM Adapters</b></p> <p><b>NOTE:</b> The FlexibleLOM Adapters in this section is required if the Dual</p> |
|-----------------------|---|

## Configuration Information – Factory Integrated Models

FlexibleLOM Riser Kit (757401-B21) is selected

**NOTE:** FlexibleLOM Adapters in this section is Factory Integrated Only (FIO) options.

**NOTE:** FlexibleLOM Adapters can only be selected in pair of matching part numbers.

|  |            |
|--|------------|
| HPE Ethernet 10Gb 2-port 561FLR-T FIO Adapter      | 700700-B21 |
| HPE Ethernet 10Gb 2-port 560FLR-SFP+ FIO Adapter   | 684218-B21 |
| HPE FlexFabric 10Gb 2-port 534FLR-SFP+ FIO Adapter | 700752-B21 |
| HPE FlexFabric 10Gb 2-port 533FLR-T FIO Adapter    | 700760-B21 |
| HPE Ethernet 10Gb 2-port 530FLR-SFP+ FIO Adapter   | 684210-B21 |
| HPE Ethernet 1Gb 4-port 366FLR FIO Adapter         | 684217-B21 |
| HPE Ethernet 1Gb 4-port 331FLR FIO Adapter         | 684208-B21 |

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: <http://www.hp.com/go/ProLiantNICs>

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### Step 4: Choose Additional Options for Factory Integration

**NOTE:** For additional options, please refer to the "Core Options" and "Additional Options" section 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 an Hewlett Packard Enterprise approved configurator. Contact your local sales representative for additional information.

| HPE Memory | Unbuffered with ECC DIMMs (UDIMMs)  |            |
|------------|---|------------|
|            | HPE 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit              | 669324-B21 |
|            | HPE 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit | 713979-B21 |
|            | HPE 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit  | 647909-B21 |
|            | HPE 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit              | 669322-B21 |
|            | HPE 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit  | 647907-B21 |
|            | HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit            | 669320-B21 |
|            | HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit            | 669320-B21 |
|            | HPE 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit | 713979-B21 |

## HPE Hard 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.

**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:** Hard drives must be selected in pair of matching part numbers.

### SAS Hot Plug with SmartDrive SFF (2.5-inch) Enterprise 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 15K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652611-B21 |
| HPE 300GB 6G SAS 10K rpm SFF (2.5-inch) SC Enterprise 3yr Warranty Hard Drive | 652564-B21 |

### SAS Hot Plug SmartDrive SFF (2.5-inch) Midline Drives

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

### 6G SATA Hot Plug with SmartDrive SFF (2.5-inch) Midline (MDL) 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 |

## HPE Networking

|  |            |
|--|------------|
| HPE Ethernet 10Gb 2-port 530FLR-SFP+ Adapter | 647581-B21 |
| HPE Ethernet 10Gb 2-port 560FLR-SFP+ Adapter | 665243-B21 |
| HPE Ethernet 10Gb 2-port 561FLR-T Adapter    | 700699-B21 |

**Core Options**

|  |            |
|--|------------|
| HPE FlexFabric 10Gb 2-port 533FLR-T Adapter    | 700759-B21 |
| HPE FlexFabric 10Gb 2-port 534FLR-SFP+ Adapter | 700751-B21 |
| HPE Apollo 6000 Dual FlexibleLOM Riser Kit     | 757401-B21 |

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information: <http://www.hp.com/go/ProLiantNICs>

## Additional Options

|  |  |            |
|--|--|------------|
| <b>HPE<br/>Insight<br/>Software</b>  | <b>HPE Insight Control</b>   |            |
|  | <b>Integrated Lights-Out (iLO)</b>   |            |
|  | <b>HPE iLO Scale Out</b>   |            |
|  | HPE iLO Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU       | BD776AAE   |
|  | HPE iLO Scale-Out 3yr 24x7 Tech Support and Updates Flexible Quantity LTU          | BD776A     |
|  | HPE iLO Scale-Out including 3yr 24x7 Tech Support and Updates Tracking LTU         | BD777A     |
|  | HPE iLO Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU       | BD778AAE   |
|  | HPE iLO Scale-Out 1yr 24x7 Tech Support and Updates Flexible Quantity LTU          | BD778A     |
|  | HPE iLO Scale-Out including 1yr 24x7 Tech Support and Updates Tracking LTU         | BD779A     |
|  | HPE iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU            | E6U64ABE   |
|  | <b>HPE Integrated Lights-Out (iLO) Advanced for ProLiant</b>                       |            |
|  | HPE iLO Advanced including 1yr 24x7 Technical Support and Updates 1-server LTU     | 512485-B21 |
|  | HPE iLO Advanced including 3yr 24x7 Tech Support and Updates 1-server LTU          | BD505A     |
|  | HPE iLO Advanced including 3yr 24x7 Tech Support and Updates Flexible Quantity LTU | BD506A     |
| HPE iLO Advanced including 3yr 24x7 Tech Support and Updates Tracking LTU  | BD507A   |            |
| HPE iLO Advanced including 1yr 24x7 Technical Support and Updates Tracking LTU   | 512487-B21   |            |
| <b>NOTE:</b> For additional license options please see the QuickSpecs at:<br><a href="https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04154343">https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04154343</a> |  |            |
| <b>NOTE:</b> For more information, visit: <a href="http://www.hp.com/go/ilo">http://www.hp.com/go/ilo</a>  |  |            |

|   |  |        |
|---|--|--------|
| <b>High Performance<br/>Clusters</b>  | <b>HPE Cluster Management Utility</b>  |        |
|   | HPE Insight Cluster Management Utility 1yr 24x7 Flexible LTU   | QL803B |
|   | HPE Insight Cluster Management Utility 3yr 24x7 Flexible LTU   | BD476A |
|   | <b>NOTE:</b> 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 also will receive a support agreement. |        |
|   | HPE Insight Cluster Management Utility Media   | BD477A |
| <b>NOTE:</b> For additional license kits please see the QuickSpecs at:<br><a href="https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111735">https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111735</a> |  |        |

### HPE Storage Controllers SAS Controllers

#### Smart Array P430 Controller

|  |            |
|--|------------|
| HPE Smart Array P430/2GB FBWC 12Gb 1-port Int SAS Controller | 698529-B21 |
| HPE Smart Array P430/4GB FBWC 12Gb 1-port Int SAS Controller | 698530-B21 |

#### Host Bus Adapter

**NOTE:** Please see the QuickSpecs for Technical Specifications and additional information:  
<https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04111455>  
(HBA 220)

## Additional Options

|                                   |   |            |
|-----------------------------------|---|------------|
| <b>HPE Advanced Power Manager</b> | HPE Advanced Power Manager Kit  | 741192-B21 |
|                                   | <b>NOTE: Each HPE APM can connect up to 10 chassis via consolidated chassis management cable.</b> |            |
|                                   | HPE 4M 20 Pin Consolidated Management Cable   | 762048-B21 |
|                                   | <b>NOTE: 1 cable per chassis.</b>   |            |
|                                   | HPE 3M MicroDB9 to MicroDB9 Cable   | 762049-B21 |
|                                   | <b>NOTE: This cable is required for connectivity to DC Power shelf.</b>                           |            |

### HPE Rack Options

#### HPE USB BFR with PVC Free Keyboard/Mouse Kit

|  |            |
|--|------------|
| HPE USB BFR with PVC Free US Keyboard/Mouse Kit      | 631341-B21 |
| HPE USB BFR with PVC Free UK Keyboard/Mouse Kit      | 631344-B21 |
| HPE USB BFR with PVC Free FR Keyboard/Mouse Kit      | 631346-B21 |
| HPE USB BFR with PVC Free ES Keyboard/Mouse Kit      | 631348-B21 |
| HPE USB BFR with PVC Free DE Keyboard/Mouse Kit      | 631358-B21 |
| HPE USB BFR with PVC Free JP Keyboard/Mouse Kit      | 631360-B21 |
| HPE USB BFR with PVC Free IT Keyboard/Mouse Kit      | 631362-B21 |
| HPE USB BFR with PVC Free CN Keyboard/Mouse Kit      | 631364-B21 |
| HPE USB BFR with PVC Free AE Keyboard/Mouse Kit      | 638212-B21 |
| HPE USB BFR with PVC Free RU Keyboard/Mouse Kit      | 638214-B21 |
| HPE USB BFR with PVC Free IN Keyboard/Mouse Kit      | 672097-D63 |
| HPE USB BFR with PVC Free AP-Intl Keyboard/Mouse Kit | 672097-373 |
| HPE USB BFR with PVC Free Intl Keyboard/Mouse Kit    | 672097-B33 |
| HPE USB BFR with PVC Free PT Keyboard/Mouse Kit      | 672097-133 |
| HPE USB BFR with PVC Free TR Keyboard/Mouse Kit      | 672097-143 |
| HPE USB BFR with PVC Free CZ Keyboard/Mouse Kit      | 672097-223 |
| HPE USB BFR with PVC Free FI Keyboard/Mouse Kit      | 672097-353 |
| HPE USB BFR with PVC Free SE Keyboard/Mouse Kit      | 672097-103 |
| HPE USB BFR with PVC Free CH Keyboard/Mouse Kit      | 672097-113 |
| HPE USB BFR with PVC Free KR Keyboard/Mouse Kit      | 672097-KD3 |

**NOTE: Please see the QuickSpecs for Technical Specifications and additional information:**

**<https://www.hpe.com/h20195/v2/GetHTML.aspx?docname=c04168349>**  
(Worldwide)

### HPE USB and SD Options HPE Flash Media Kits for USB Drives

|   |            |
|---|------------|
| HPE 8GB USB Enterprise Mainstream Flash Media Drive Key Kit | 737953-B21 |
| <b>NOTE: 36pin SUV Dongle Kit is required.</b>              |            |

#### Other USB and SD Options

|  |            |
|--|------------|
| HPE 36pin Serial/USB/VGA Dongle Cord Kit | 676277-B21 |
|--|------------|

#### HPE Enterprise Mainstream Flash Media Kits for Memory Cards

|  |            |
|--|------------|
| HPE 8GB microSD Enterprise Mainstream Flash Media Kit  | 726116-B21 |
| HPE 32GB microSD Enterprise Mainstream Flash Media Kit | 700139-B21 |

## Memory

### HPE SmartMemory

New HPE SmartMemory now provides additional protection for your servers. With HPE Authentication it can verify that you have true HPE Qualified Memory in your HPE ProLiant Gen8 server. With HPE SmartMemory your new HPE ProLiant server can take advantage of additional Gen8 enhancements in performance, durability and future manageability support through HPE Active Health System

For detailed memory configuration rules and guidelines, please use the Online DDR3 Memory Configuration Tool:

<http://www.hp.com/go/ddr3memory-configurator>

### Memory Subsystem Architecture

Intel Processor socket supports 2 channels and 2 DIMMs per channel. Total max. memory up to 32GB DDR3 PC3-12800E1600MHz.

### Standard Memory Plus Optional Memory

Up to 32 GB memory is available with the optional installation of 4 x 8GB PC3-12800E UDIMM ECC DDR3 UDIMM Memory kits, operating at 1600MHz when fully populated at 2 DIMMs per Channel in 4 slots.

**NOTE:** The below chart does not represent all possible memory configurations.

**NOTE:** For best performance, it is recommended that customer installs memory in identical pairs

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.
- Install DIMMs only if the corresponding processor is installed.
- There are two channels per processor with two DIMM slots per channel.
- Memory channel A consists of the two (2) DIMMs that are closest to the processor.
- Memory channel B consists of the two (2) DIMMs that are furthest from the processor.
- Populate DIMMs from heaviest load (quad-rank) to lightest load (single-rank) within a channel
- Heaviest load (DIMM with most ranks) within a channel goes furthest from the processor
- No support for RDIMMs; Non-ECC UDIMMs
- DIMMs of different speeds may be mixed in any order; the server will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- 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.hp.com/products/QuickSpecs/14225\\_div/14225\\_div.html](http://h18000.www1.hp.com/products/QuickSpecs/14225_div/14225_div.html).
- For memory population rules and additional memory guidelines, please see the HPE ProLiant XL220 Gen8 v2 user guide at <http://www.hp.com/support>.

### DIMM slot/capacity/populated speed table

| DIMM Type               | Unbuffered with ECC DIMMs (UDIMMs) |      |      |                |      |      |      |      |      |
|-------------------------|------------------------------------|------|------|----------------|------|------|------|------|------|
| DIMM Rank               | Single Rank (1R)                   |      |      | Dual Rank (2R) |      |      |      |      |      |
| DIMM Capacity           | 2GB                                | 2GB  | 2GB  | 4GB            | 4GB  | 8GB  | 8GB  | 4GB  | 8GB  |
| DIMM Native Speed (MHz) | 1333                               | 1600 | 1600 | 1333           | 1600 | 1333 | 1600 | 1600 | 1600 |
| Voltage                 | LV                                 | Std  | LV   | LV             | Std  | LV   | Std  | LV   | LV   |

### SLOTS THAT CAN BE POPULATED

|                |   |   |   |   |   |   |   |   |   |
|----------------|---|---|---|---|---|---|---|---|---|
| 4 slot servers | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
|----------------|---|---|---|---|---|---|---|---|---|



## Memory

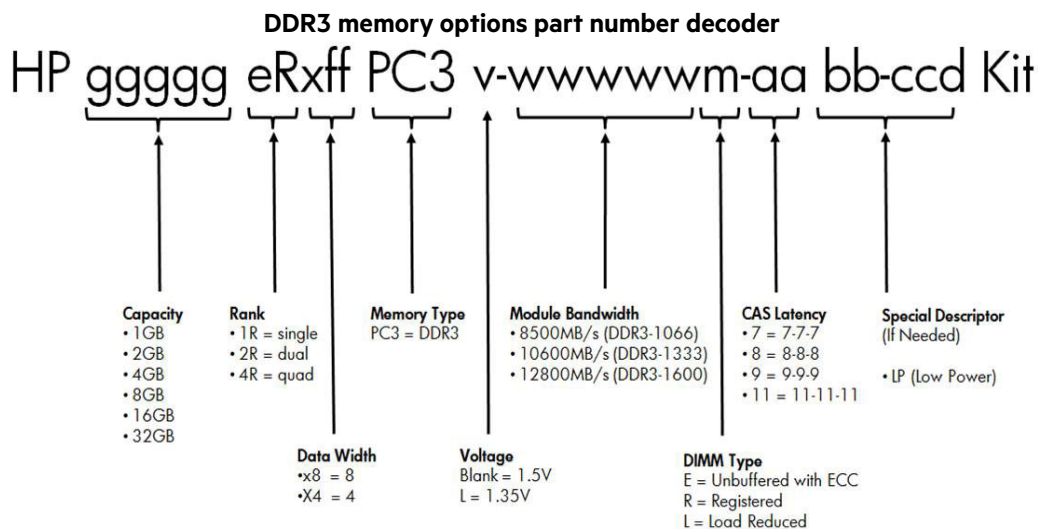
| MAXIMUM CAPACITY (GB)*     |        |      |      |        |      |        |      |      |      |
|----------------------------|--------|------|------|--------|------|--------|------|------|------|
| Capacity                   | 8      | 8    | 8    | 16     | 16   | 32     | 32   | 16   | 32   |
| POPULATED DIMM SPEED (MHz) |        |      |      |        |      |        |      |      |      |
| 1 DIMM Per Channel         | 1333   | 1600 | 1600 | 1333   | 1600 | 1333   | 1600 | 1600 | 1600 |
| 2 DIMM Per Channel         | 1333** | 1600 | 1600 | 1333** | 1600 | 1333** | 1600 | 1600 | 1600 |

\* Maximum capacity will vary based on individual server platform qualification schedule

\*\* For HPE SmartMemory, UDIMM is supported at 2DPC@DDR3-1333. Third party memory may only support up to 2DPC@DDR3-1066.

**NOTE:** Capacity references are rounded to the common Gigabyte values:

- 2GB = 2048MB
- 4GB = 4096MB
- 8GB = 8192MB
- 16GB = 16384MB



Following are memory options available from HPE:

## HPE Memory

## Unbuffered with ECC DIMMs (UDIMMs)

|   |            |
|---|------------|
| HPE 8GB (1x8GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit              | 669324-B21 |
| HPE 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit | 713979-B21 |
| HPE 8GB (1x8GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit  | 647909-B21 |
| HPE 4GB (1x4GB) Dual Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit              | 669322-B21 |
| HPE 4GB (1x4GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit  | 647907-B21 |
| HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit            | 669320-B21 |

**Memory**

|   |            |
|---|------------|
| HPE 2GB (1x2GB) Single Rank x8 PC3-12800E (DDR3-1600) Unbuffered CAS-11 Memory Kit            | 669320-B21 |
| HPE 8GB (1x8GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit | 713979-B21 |

## Technical Specifications

|                     |  |   |   |  |
|---------------------|--|---|---|--|
| <b>System Unit</b>  | <b>Server Dimensions</b><br>(L x W x D)      | 1.70 x 8.33 x 27.87 in (4.33 x 21.15 x 70.79 cm)  |   |  |
|                     | <b>Shipping Dimensions</b><br>(L x W x D)    | 37.63 x 15.13 x 9 in (95.5 x 38.4 x 22.8 cm)  |   |  |
|                     | <b>Weight</b><br>(approximate)               | Maximum<br>(four hard drives and two processors installed)  | 15.0 lb (6.8 kg)  |  |
|                     | <b>System Inlet Temperature</b>              | Operating   | 50° to 95° F (10° to 35° C) at sea level with an altitude derating of 1.8°F per every 1000 ft (1.0°C per every 304.8 m) above sea level to a maximum of 10,000 ft (3048 m), no direct sustained sunlight. Maximum rate of change is 18°F/hr (10°C/hr). The upper limit may be limited by the type and number of options installed.<br>System performance may be reduced if operating with a fan fault or above 86°F (30°C). |  |
|                     |  | Non-operating   | -22° to 140° F (-30° to 60° C)<br>Maximum rate of change is 36°F/hr (20°C/hr).  |  |
|                     | <b>Relative Humidity</b><br>(non-condensing) | Operating   | 10% to 90% relative humidity (Rh), 82.4°F (28°C) maximum wet bulb temperature, non-condensing.  |  |
|                     |  | Non-operating   | 5% to 95% relative humidity (Rh), 101.7°F (38.7°C) maximum wet bulb temperature, non-condensing.  |  |
|                     | <b>Altitude</b>                              | Operating   | 10,000 ft (3048 m). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1500 ft/min (457 m/min).   |  |
|                     |  | Non-operating   | 30,000 ft (9144 m). Maximum allowable altitude change rate is 1500 ft/min (457 m/min).  |  |
|                     | <b>Emissions Classification</b><br>(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.

|   |   |   |
|---|---|---|
| <b>Environment-friendly Products and Approach</b> | <b>End-of-life Management and Recycling</b> | 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: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> 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. |
|---|---|---|

## Technical Specifications

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.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HPE OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

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## Summary of Changes

| Date        | Version History     | Action  | Description of Change  |
|-------------|---------------------|---------|--|
| 26-Oct-2016 | From version 5 to 6 | Updated | Rebranded QuickSpecs   |
| 09-Feb-2015 | From Version 4 to 5 | Changed | Changed one overview image and refreshed the TS Verbiage.                            |
| 01-Nov-2014 | From Version 3 to 4 | Changed | Changes made throughout the QuickSpecs.  |
| 29-Sep-2014 | From Version 2 to 3 | Changed | Changes made throughout the QuickSpecs.  |
| 13-Jun-2014 | From Version 1 to 2 | Changed | Changes made to the Standard Features, Memory and Technical Specifications sections. |



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For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less.

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