QuickSpecs

Overview

HP ProLiant XL730f Gen9 Server

For ground-breaking research in science and engineering workloads such as climate modeling or manufacturing simulations, the HP ProLiant XL730f Gen9 Server advances the science of supercomputing with up to 144 x 2P servers per HP Apollo f8000 Rack. The ProLiant XL730f Gen9 Server in the HP Apollo 8000 System reaches new heights of performance density.

The ProLiant XL730f Gen9 Server has 2 x 2P nodes per tray with up to 144 servers per rack for more performance per rack. Each node delivers performance density with Intel® Xeon® processors, provide the processing power needed to handle a variety of demanding workloads. Supports up to 256Gb memory/node, with 1 x 120GB SSD. One high performance FDR InfiniBand port per server and 1Gb NIC per server enhance connectivity and data availability.

The all new ProLiant XL730f Gen9 Server with HP ProActive Insight architecture delivers even greater levels of configurability for Supercomputing environments that require the highest possible performance density and cooling efficiency, with an eye toward energy recycling. Dry disconnect server trays provide liquid cooling via sealed copper tubes, with heat exchange via thermal bus bars in the rack. Delivering on the promise of server lifecycle automation, the ProLiant XL730f Gen9 Server features the exclusive HP Active Heath System and provides continuous, proactive, monitoring for over 1600 system parameters with zero impact to application performance.

The HP Apollo 8000 System Solution is comprised of the following components:

- One or more Apollo f8000 Racks with HP ProLiant XL730f Gen9 Servers, one or more HP Apollo 8000 iCDU Racks, and their associated onboard CDU control system.
- Primary plumbing interface assembly kit that connects the individual Apollo 8000 iCDUs Racks to the facility water system.
- Secondary plumbing system that connects the individual the Apollo f8000 Racks to the HP Apollo 8000 iCDU Racks. This secondary closed loop system provides cooling for the Apollo f8000 Rack and isolates it from untreated, potentially incompatible primary water.
- High-speed (FDR) InfiniBand networking built into the Apollo f8000 Rack.
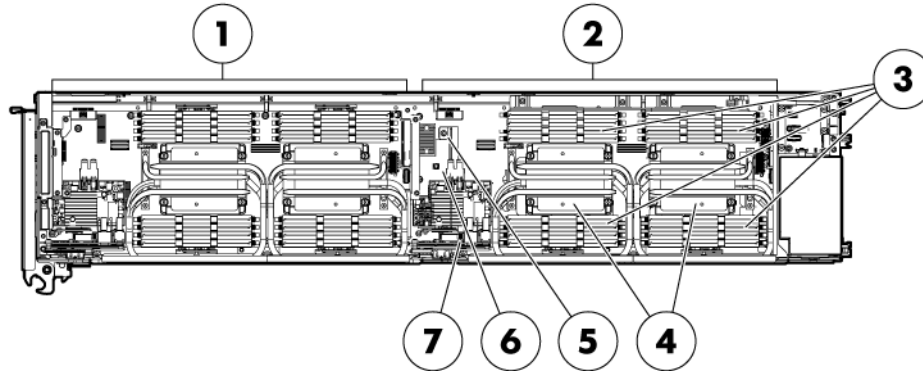
Front view of the ProLiant XL730f Gen9 Server
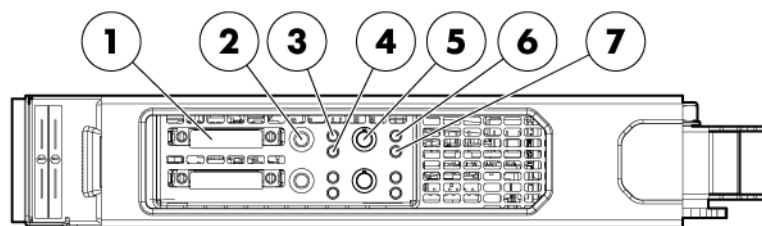
Item Description
1. SUV (serial, USB, video) port
2. Power Switch
3. iLO LED
4. Health LED
5. UID LED
6. NIC2
7. NIC1

Overview

Open View

Item Description

1. Front Server
2. Rear Server
3. Sixteen (16) DDR4 DIMM slots per server
4. Two Intel® Xeon® E5-2600 processors
5. Optional one (1) SSD
6. IB Adapter Kit
7. 1Gb Ethernet Adapter

Standard Features

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

Processor One of the following	**E5-2600 v3 series Processors** **Performance Processors** **NOTE:** All support up to 2133MHz DDR4 memory speeds. Intel® Xeon® E5-2695 v3 (2.3GHz/14-core/35MB/9.6GT-s QPI/120W, DDR4-2133, HT) Intel® Xeon® E5-2690 v3 (2.6GHz/12-core/30MB/9.6GT-s QPI/135W, DDR4-2133, HT) Intel® Xeon® E5-2680 v3 (2.5GHz/12-core/30MB/9.6GT-s QPI/120W, DDR4-2133, HT) Intel® Xeon® E5-2670 v3 (2.3GHz/12-core/30MB/9.6GT-s QPI/120W, DDR4-2133, HT) **NOTE:** The processor specifications are the Intel values given at time of publication and are subject to change based on Intel information. **NOTE:** HT indicates that the processor model supports Intel® Hyper-Threading Technology. **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:** Up to 2 processors supported. Mixing different processor models is not supported. **NOTE:** For the Intel® C610 Chipset E5-2600 v3 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 = v3.
Cache Memory One of the following depending on Model	35MB (1x35MB) Level 3 **NOTE:** For Fourteen-core processors. 30MB (1x30MB) Level 3 **NOTE:** For Twelve-core processors.
Chipset	Intel® C610 Series Chipset Intel® E5-2600 v3 Processor Family **NOTE:** For more information regarding Intel® chipsets, please see the following URL: http://www.intel.com/products/server/chipsets/.
HP Server UEFI ROM	The HP ProLiant System BIOS is an EDK2 UEFI solution, and adheres to the latest revisions of UEFI Class 2 specifications, which supports both UEFI Boot Mode and Legacy BIOS Boot Mode. The HP ProLiant XL730f Gen9 Server defaults to UEFI Boot Mode and can be factory or field configured for Legacy BIOS Boot Mode if required. **NOTE:** For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI. To modify the server configuration ROM default settings, press F9 in the HP ProLiant POST screen to enter the HP UEFI System Utilities screen. By default, the System Utilities menus are in the English language. **NOTE:** UEFI System Utilities support Legacy BIOS Boot Mode like HP ROM-Based Setup Utility (RBSU). For more information, please visit http://www.hp.com/go/proliantuefi/docs. UEFI enables numerous new capabilities, including both industry standard functionality and features specific to HP ProLiant servers. The following are some of the features that UEFI enables and that the HP ProLiant XL730f Gen9 Server can support when configured for UEFI Boot Mode: - Secure Boot - A new feature in which the system firmware, option card firmware, operating systems, and software collaborate to greatly enhance platform security. - 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 HP Smart Array. - UEFI Shell - Provides a pre-boot environment for running scripts and tools. The HP ProLiant UEFI Shell provides both standard capabilities as well as numerous enhancements. - PXE boot support for IPv6 networks.

Standard Features

- 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.

On System Management Processor	HP iLO (Firmware: HP iLO 4 v2.0) **NOTE:** For more information, visit: http://www.hp.com/go/ilo.

Memory Protection	Advanced ECC (multi-bit error protection) Memory Online Spare Mode Memory Lock Step Mode Memory Mirroring Mode

Memory	Type	HP SmartMemory DDR4 Registered (RDIMM)
	DIMM Slots Available	16 DIMM Slots available per server and 32 slots available per tray
	Maximum (RDIMM) (per server)	256GB (16 x16GB) Registered memory configurations

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html

Network Controller	HP Ethernet 1Gb 2-port 363i Adapter HP InfiniBand FDR/Ethernet 10/40Gb 2-port 544+A8L Adapter **NOTE:** One 1GbE port and one port of FDR InfiniBand per server **NOTE:** Each adapter interoperates with the corresponding Ethernet switch and InfiniBand switch via the HP Apollo f8000 Rack infrastructure.

Storage Controller	1x SATA 3 port from Embedded C610 Chipset controller for the embedded SSD.

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
	Solid State Drives	One SSD per server

Maximum Internal Storage	SATA SFF SSD	120 GB	1x120 GB
	SATA SFF SSD	80 GB	1x80 GB

Interfaces **NOTE:** The only interface that is front pluggable on the ProLiant XL730f Gen 9 Server is the SUV port	**Base Network**	Two 1GbE NIC ports per XL730f Gen9 tray (one 1GbE NIC port per server)
	InfiniBand Interface	The ProLiant XL730f Gen9 Server offers InfiniBand Adapter Kit.
	KVM	Serial USB Video Port (SUV)
	Micro SD	1 (internal)
	USB Ports	1 (internal)
	HP iLO Remote Management Network Port	1 GbE dedicated internal port
	iLO LED	2 front
	Health LED	2 front
	Power	2 front
	UID	2 front
	Network LED	2 front

Standard Features

Industry Standard Compliance	ACPI 2.0b Compliant WOL Support PXE Support USB 1.1 and 2.0 Compliant SMBIOS 2.7.0
Tray Power Supply	Each ProLiant XL730f Gen 9 Server Tray comes equipped with a High Voltage to 12V Power converter to supply each server in the tray. Each power supply embedded on the ProLiant XL730f Gen9 Server Tray is capable of providing 1200 W total and 600 W per server node.
Operating Systems	Red Hat Enterprise Linux (RHEL) SUSE Linux Enterprise Server (SLES) **NOTE:** Only 64-bit versions of these operating systems are supported. **NOTE:** For more information on the HP Certified and Supported ProLiant Servers for OS and latest listing of software drivers available for your server including how to purchase from HP, please visit our OS Support Site at: http://www.hp.com/go/ossupport 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) HP 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 XL730f Gen9Server is 1U, half-width.
Embedded Management	The ProLiant XL730f Gen9Server has 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. These features come standard on all HP ProLiant Gen9 servers. The HP iLO Management Engine portfolio includes: • **HP iLO:** Monitor your servers for ongoing management, service alerting, reporting and remote management with iLO. Learn more at www.hp.com/go/ilo. • **UEFI:** Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at www.hp.com/go/ProLiant/uefi. • **Intelligent Provisioning:** Provision servers by discovering and deploying one to few servers with Intelligent Provisioning. Learn more at www.hp.com/go/intelligentprovisioning. • **Embedded Remote Support:** HP's embedded remote support, Insight Online direct connect or HP Insight Remote Support, enables HP ProLiant systems to directly link to phone home support without additional software or hardware and user's monitor their IT environment anywhere, anytime. Learn more at www.hp.com/go/insightonline/info.

Standard Features

HP Server Utilities and Tools	**HP Smart Updates**	Optimize firmware and driver updates with HP Smart Update solutions. www.hp.com/go/smartupdate.
	HP Systems Insight Manager (HP SIM)	HP SIM allows you to monitor the health of your HP ProLiant Servers and HP Integrity Servers, and also provides you with basic support for non-HP servers. Learn more at www.hp.com/go/sim.
	Scripting Toolkits	Provision servers using your own scripts to discover and deploy servers at scale. Learn more at www.hp.com/go/ProLiantSTK.
	HP 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: www.hp.com/go/ilo/mobileapp.

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

Warranty	This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP 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 HP 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 HP 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

Server & Infrastructure Management	HP iLO Advanced	The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. Learn more about HP iLO Advanced at www.hp.com/go/iloadvanced.
	HP iLO Scale-Out	The license includes advanced power management, fast access through scripting tools and lower operational cost, in massive scale out environments, for maximum data center efficiency. Learn more about HP iLO Scale-Out www.hp.com/go/ilo/scale-out.
	HP Insight Control	HP Insight Control, lets you 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.
High Performance Clusters	HP Cluster Platforms	HP 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
	HP HPC Interconnects	High Performance Computing (HPC) interconnect technologies are available for this server as part of the HP Cluster Platform portfolio. These high-speed InfiniBand and Gigabit interconnects are fully supported by HP when integrated within an HP cluster. Flexible, validated solutions can be defined with the help of configuration tools. http://www.hp.com/techservers/clusters/ucp/index.html
	HP Insight Cluster Management Utility	HP Insight Cluster Management Utility is a Hyperscale cluster management framework and suite of tools for large Linux clusters such as those found in High Performance Computing (HPC) environments. Learn more at www.hp.com/go/cmu.
HP Insight Online		HP Insight Online is a new addition to the HP Support Center for one stop, secure access to product and HP support information personalized to your IT environment. Insight Online can automatically display devices remotely monitored by HP 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. www.hp.com/go/insightonline
Factory Express Portfolio for Servers and Storage		HP Factory Express offers configuration, customization, integration and deployment services for HP servers and storage products. Customers can choose how their factory solutions are built, tested, integrated, shipped and deployed.
		Factory Express offers service packages for simple configuration, racking, installation, complex configuration and design services as well as individual factory services, such as image loading, asset tagging, and custom packaging. HP products supported through Factory Express include a wide array of servers and storage and HP networking products.
		For more information on Factory Express services for the Apollo 8000 System model please contact your sales representative or go to: http://www.hp.com/go/factory-express.

Service and Support

Service and Support	**HP Technology Services for HP Apollo 8000 Systems** Capitalizing on the capabilities of this technology requires a service partner who understands your increasingly complex business technology environment. That's why it makes sense to team up with the people who know HP infrastructure hardware and software best - the experienced professionals at HP. We provide several recommendations of services to help optimize your IT operations and minimize risk to drive better business outcomes. **What HP Technology Services can do for you** Our services can help you design, deploy, test, integrate, support, and manage IT and infrastructure solutions to save deployment time, reduce errors and simplify your support experience. We offer several support levels; you select the type and level of service that is most suitable for your business need – HP Datacenter Care supports your IT environment, providing the right mix of proactive services and reactive hardware and software and support coverage to meet your IT and budget needs. HP Proactive Care delivers high levels of system availability through proactive service management and advanced technical response while HP Foundation Care offers scalable hardware and software support. For maximum flexibility on the Apollo 8000 System, we sell HP Care Pack Services on HP Apollo 8000 iCDU Rack, the HP Apollo f8000 Rack, and the HP ProLiant XL730f Gen9 Server. The recommendations below cover the ProLiant XL730f Gen9 Server only. Support for both servers in the tray is provided with support purchased on the tray itself.
Optimized Services recommendation	**Optimized recommendation:** Supports maintaining servers at optimum performance availability **HP ProLiant XL730f Gen9Server Hardware Installation** Provides for the basic hardware installation of HP ProLiant XL730f Gen9 Server, storage devices and networking options to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf **HP Proactive Care Service, 3-Year HP 24x7 4 hour Response, HP Care Pack** Helps prevent IT issues, maintain stability so you can focus on business requirements. Includes proactive reports, 24x7 hardware coverage with four hour response, collaborative software support with rapid access to advanced technical expertise. System connectivity to HP support tools is a prerequisite. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf **Additional Services:** Data Center Transformation Services to plan and deploy your high performance computing infrastructure.
Standard Services recommendation	**Standard recommendation**: Maintains high level of server availability **HP ProLiant Server Hardware Installation** Provides for the basic hardware installation of HP ProLiant XL730f Gen9 Server to assist you in bringing your new hardware into operation in a timely and professional manner http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf **HP Proactive Care Service, 3-Year HP Next Business Day Response, HP Care Pack** Helps prevent IT issues, maintain stability so you can focus on business requirements. Includes proactive reports, 24x7 hardware coverage with next business day hardware response, collaborative software support with rapid access to advanced technical expertise. System connectivity to HP support tools is a prerequisite. http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf
Basic Support recommendation	**Basic support services:** minimum support services recommendation

Service and Support

HP ProLiant Server Hardware Installation
Provides for the basic hardware installation of HP ProLiant XL730f Gen9 Server to assist you in bringing your new hardware into operation in a timely and professional manner
http://h20195.www2.hp.com/V2/GetPDF.aspx/5981-9356EN.pdf

HP Foundation Care Service, 3-Year HP Next Business Day Response, HP Care Pack
Provides reactive support coverage with next-business day response time. Collaborative software support is included.
http://h20195.www2.hp.com/V2/GetPDF.aspx/4AA3-2140ENW.pdf

HP Support Center	Personalized online support portal with access to information, tools and experts to support your HP Apollo 8000 System. Submit support cases online, chat with HP experts, access support resources or collaborate with peers. Learn more http://www.hp.com/go/hpsc HP's 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 personalized IT support anywhere, any time. Our support tools are available at no additional cost with a HP warranty, HP Care Pack or HP contractual support agreement. *The HP Support Center Mobile App is subject to local availability
For more information	To learn more on HP Apollo 8000 System, please contact your HP sales representative or HP Authorized Channel Partner. Or visit: http://www.hp.com/services/proliant

Configuration Information - Factory Integrated Models

NOTE: The HP Apollo 8000 System ships as a Factory Integrated, Configured-To-Order (CTO) product only.

The Apollo 8000 System consists of up to seventy-two (72) HP ProLiant XL730f Gen9 Server Trays in a single HP Apollo f8000 Rack, cooled by a single HP Apollo 8000 iCDU Rack. The Apollo 8000 System is only sold as a Factory Integrated Model. To ensure only valid configurations are ordered, the sales system acts as a configurator. Contact your local sales representative for information on configurable product offerings and requirements. This section lists some of the steps required to configure a Factory Integrated Model of the Apollo 8000 System.

NOTE: Each Apollo 8000 System must include an Apollo f8000 Rack, an Apollo 8000 iCDU Rack, at least seventy-two (72) ProLiant XL730f Gen9 Server Trays and eight (8) HP InfiniBand Switches for Apollo 8000.
NOTE: Apollo 8000 Systems start with the 144 ProLiant Servers part of 72 HP ProLiant XL730f Gen9 Server Trays.
NOTE: FIO indicates that this option is only available as a factory installable option.

Step 1. Choose at least seventy-two (72) ProLiant XL730f Gen9 Server Trays for 144 servers total.

HP XL730f CTO 2x Server   774055-B21
NOTE: Each 2x Server (Tray) can be configured with Front and Rear Nodes (No other Options.) Must select one Front Node and one Rear Node per 2x Server (Tray).

    HP XL730f Gen9 FIO Front Node   788043-B21
    NOTE: Option selection/configuration must match between Front and Rear Nodes. Front node requires selection of two processors, memory, and network card.
    HP XL730f Gen9 FIO Rear Node   788042-B21
    NOTE: Option selection/configuration must match between Front and Rear Nodes. Rear node requires selection of two processors, memory, and network card.

Step 2. Choose one of the following Intel E5 2600v3 Xeon processors for each server tray.

NOTE: Processor mixing of different frequencies and Wattage is not supported in any single tray. For each ProLiant XL730f Gen9 Front Node and Rear Node choose one xxxxxx-L21 and one xxxxxx-B21. Four processors (two 2P servers) ship standard with each ProLiant XL730f Gen9 Server Tray.

Processors		
	Intel Xeon E5-2670 v3	
	HP XL7x0f Intel® Xeon® E5-2670 v3 FIO Processor Kit	775159-L21
	HP XL7x0f Intel® Xeon® E5-2670 v3 Processor Kit	775159-B21
	Intel Xeon E5-2680 v3	
	HP XL7x0f Intel® Xeon® E5-2680 v3 FIO Processor Kit	775160-L21
	HP XL7x0f Intel® Xeon® E5-2680 v3 Processor Kit	775160-B21
	Intel Xeon E5-2690 v3	
	HP XL7x0f Intel® Xeon® E5-2690 v3 FIO Processor Kit	775161-L21
	HP XL7x0f Intel® Xeon® E5-2690 v3 Processor Kit	775161-B21
	Intel Xeon E5-2695 v3	
	HP XL7x0f Intel® Xeon® E5-2697 v3 FIO Processor Kit	775162-L21
	HP XL7x0f Intel® Xeon® E5-2697 v3 Processor Kit	775162-B21

Step 3. Choose memory for each ProLiant XL730f Gen9 Server Tray

NOTE: Choose a minimum of 4 kits per server tray or a maximum of 32 kits per server tray. Choose in multiples of 4.

Memory		
	HP 8GB (1x8GB) Single Rank x4 Registered Heat Spreader Memory Kit	778267-B21
	HP 16GB (1x16GB) Dual Rank x4 Registered Heat Spreader Memory Kit	778268-B21

Configuration Information - Factory Integrated Models

Step 4. Choose the required network solution

NOTE: Each ProLiant XL730f Gen9 Server Tray ships with 2 network adapters, 1 per server.

Network Adapter	HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+A8L Adapter	778509-B21

Step 5. Choose a hard drive enablement kit for the SSD.

NOTE: Choose an enablement kit for each drive chosen.

HP XL7x0f Solid State Drive Enablement Kit	777899-B21

Step 6. Choose the SFF SSD for the server tray.

NOTE: Choose a minimum of 0 kits or a maximum of 2 kits per server tray, must be ordered in pairs.
NOTE: If you choose to have SSDs in the server tray, both SSDs must be the same size.

HP 120GB 6G SATA 2.5in VE NHP SSD	745794-B21
HP 80GB 6G SATA 2.5in VE NHP SSD	744683-B21

HP Apollo f8000 Rack
Choose the Apollo f8000 Racks.

NOTE: For 1-72 Server Trays, a single Apollo f8000 Rack is required. For more information, please see the HP Apollo f8000 Rack QuickSpecs.

Step 7. Choose one of each of the following.

NOTE: The Top and Bottom Rack must be ordered together

HP Apollo f8000 Bottom IT Rack	J1P06A
HP Apollo f8000 Top IT Rack	J1P07A

Step 8. Choose the infrastructure kits to support the Apollo f8000 Rack.

NOTE: Choose a minimum of 2 kits or a maximum of 2 kits per top or bottom of each Apollo f8000 Rack, must be ordered in pairs.

HP XL7x0f Integrated InfiniBand 18 2-port Fabric FIO Cartridge Cable Kit	774057-B21
HP InfiniBand FDR/Ethernet 10/40Gb 2-port 544+A8L Adapter	778509-B21
HP XL7x0f Integrated InfiniBand FDR 18-port FIO Switch Tray Kit	774059-B21

Step 9. Choose the rack plumbing kit for each Apollo f8000 Rack.

HP Apollo f8000 Rack Plumbing Kit	J1P10A

Step 10. Choose a power meter for each Apollo f8000 Rack, one per rack.

HP 480VAC Watertight FIO Power Meter	779240-B21
HP 415VAC FIO Power Meter Kit	779245-B21

Step 11. Choose a packaging option kit.

NOTE: Select this option only when shipping the rack stacked is an option.

HP Apollo f8000/iCDU Rack Packaging FIO Kit	778976-B21

Configuration Information - Factory Integrated Models

HP Apollo 8000 iCDU Rack

This cooling rack requires special site considerations, which can be understood with the *HP Apollo 8000 System Site Preparation Guide* available from your HP advisor. A single Apollo iCDU Rack can support up to four Apollo f8000 Racks. Please see the Apollo 8000 iCDU Rack QuickSpec for additional information.

Choose the Apollo 8000 iCDU Racks. For 1-4 Apollo f8000 Racks an Apollo 8000 iCDU Rack is required.

Step 12. Choose one of each of the rack bottoms.
NOTE: The Top and Bottom Rack must be ordered together.

HP Apollo 8000 iCDU Top Rack	J1P09A

NOTE: The Top iCDU Rack (J1P09A) is included as default with the Bottom iCDU Rack selection

HP Apollo 8000 iCDU Bottom Rack	J1P08A

Step 13. Choose the plumbing kits required.

HP Apollo 8000 iCDU Rack Plumbing Kit	J1P12A

NOTE: The Hose Kit is required for each rack.

HP Apollo 8000 Secondary Plumbing Kit	J1P14A

NOTE: One Apollo 8000 Secondary Plumbing Kit can support up to 3 full racks of any combination: an Apollo 8000 iCDU (Top and Bottom) or an Apollo f8000 (Top and Bottom) Rack.

HP Apollo 8000 End Assembly Kit	J1P15A

NOTE: One Apollo 8000 end plumbing kit maximum per rack.

Step 14. Choose a power meter for the Apollo 8000 iCDU Rack.

HP 480VAC Watertight FIO Power Meter	779240-B21
HP 415VAC FIO Power Meter Kit	779245-B21

Step 15. Choose other rack options.

HP Apollo Rack Ramps Packaging Kit	778975-B21

NOTE: One HP rack ramps kit per site needed for deployment as determined by Site Analysis.

HP 5900AF-48XG-4QSFP+ Switch	JC772A

NOTE: A minimum of 0 and a maximum of 6 per Bottom iCDU Rack and a minimum of 0 and a maximum of 22 per Top iCDU Rack.

HP A58x0AF 650W AC Power Supply	JC680A

NOTE: One for every switch ordered above.

HP A58x0AF Back (power side) to Front (port side) Airflow Fan Tray	JC682A

NOTE: Two for every switch ordered above.

Core Options

Processors	**E5-2600 v3 series Processors**	
	Intel Xeon E5-2670 v3	
	HP XL7x0f Intel® Xeon® E5-2670 FIO Processor Kit	775159-L21
	Intel Xeon E5-2680 v3	
	HP XL7x0f Intel® Xeon® E5-2680 FIO Processor Kit	775160-L21
	Intel Xeon E5-2690 v3	
	HP XL7x0f Intel® Xeon® E5-2690 FIO Processor Kit	775161-L21
	Intel Xeon E5-2695 v3	
	HP XL7x0f Intel® Xeon® E5-2697 FIO Processor Kit	775162-L21

HP Memory	**HP SmartMemory**	
	DDR4 Registered (RDIMM)	
	16 DIMM Slots available per server and 32 slots available per tray	
	256GB (16 x16GB) Registered memory configurations	
	HP 8GB (1x8GB) Single Rank x4 Registered Heat Spreader Memory Kit	778267-B21
	HP 16GB (1x16GB) Dual Rank x4 Registered Heat Spreader Memory Kit	778268-B21

NOTE: For additional information, please see the HP SmartMemory QuickSpecs at:
http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html
NOTE: HP certified SmartMemory must be used.
NOTE: Depending on the memory configuration and processor model, the memory speed may run at 2133 MHz or 1866MHz. Please see the Online Memory Configuration Tool at: www.hp.com/go/DDR4memory-configurator.
NOTE: The Apollo System requires heat spreaders on the DIMMs for the ProLiant XL730f Gen9 Servers. These are installed directly on the DIMM itself. These DIMMs are specifically for the ProLiant XL730f Gen9 Servers and should not be used in any other server.

HP 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.	
	HP 80GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	744683-B21
	HP 120GB 6G SATA Value Endurance SFF 2.5-in SC Enterprise Boot 3yr Wty Solid State Drive	745794-B21

HP InfiniBand	HP InfiniBand FDR/Ethernet 10Gb/40Gb 2-port 544+A8L Adapter	778509-B21

NOTE: Dual port ConnectX-3 FDR/QDR IB or 40/10GbE. No IB Enablement Kit required.
NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html
NOTE: Please see the QuickSpecs for additional information:
http://h18000.www1.hp.com/products/quickspecs/13078_na/13078_na.html

Additional Options

HP Insight Software	**HP Insight Control**	
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	HP Insight Cluster Management Utility Media	BD477A
	Integrated Lights-Out (iLO)	
	HP iLO Scale Out	
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD776AAE
	HP Integrated Lights-Out Scale-Out including 3yr 24x7 Tech Support and Updates Tracking License	BD777A
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Flex Qty E-LTU	BD778AAE
	HP Integrated Lights-Out Scale-Out 1yr 24x7 Tech Support and Updates Flex Quantity License	BD778A
	HP Integrated Lights-Out Scale-Out including 1yr 24x7 Tech Support and Updates Tracking License	BD779A
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates E-LTU	E6U59ABE
	HP iLO Advanced including 3yr 24x7 Technical Support and Updates E-LTU	E6U64ABE
	HP iLO Advanced 1 Server with 3yr 24x7 Technical Support and Updates LTU	G6F49A

NOTE: Licenses ship without media. The Media Kit for Insight Control for Linux can be ordered separately, or can be downloaded at: http://www.hp.com/go/ic-linux (click on Download button).
NOTE: Electronic and Flexible-Quantity licenses can be used to purchase multiple licenses with a single set of activation keys.
NOTE: For additional license options please see the QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/13019_na/13019_na.html

	HP Integrated Lights-Out (iLO) Advanced for ProLiant	
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Single Server License	512485-B21
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Flexible Quantity License	512486-B21
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Tracking License	512487-B21
	HP iLO Advanced including 1yr 24x7 Technical Support and Updates Electronic License	TA850AAE
	HP iLO Advanced 1 Server License with 3yr 24x7 Tech Support and Updates	BD505A
	HP iLO Advanced Flexible Qty License with 3yr 24x7 Tech Support and Updates	BD506A
	HP iLO Advanced Electronic License with 3yr 24x7 Tech Support and Updates	BD506AAE
	HP iLO Advanced Tracking License with 3yr 24x7 Tech Support and Updates	BD507A

NOTE: For additional license options please see the QuickSpecs at: http://h18004.www1.hp.com/products/quickspecs/14276_div/14276_div.html
NOTE: For more information, visit: http://www.hp.com/go/ilo

High Performance Clusters	**HP Cluster Management Utility**	
	HP Insight Cluster Management Utility 1yr 24x7 Flexible License	QL803B
	HP Insight Cluster Management Utility 3yr 24x7 Flexible License	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

Additional Options

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.

HP Insight Cluster Management Utility Media	BD477A

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

HP USB and SD Options	**HP Flash Media Kits for USB Drives**	
	HP 2GB USB Flash Media Drive Key Kit	608447-B21
	HP 8GB USB Enterprise Mainstream Flash Media Drive Key Kit	737953-B21
	HP Enterprise Mainstream Flash Media Kits for Memory Cards	
	HP 8GB microSD Enterprise Mainstream Flash Media Kit	726116-B21
	HP 32GB microSD Enterprise Mainstream Flash Media Kit	700139-B21

NOTE: Please see the QuickSpecs for Technical Specifications and additional information:
http://h18000.www1.hp.com/products/quickspecs/13971_na/13971_na.html

Other USB and SD Options

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

Memory

HP ProLiant XL730f Gen 9Server
DDR4 memory population guidelines
For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool:
www.hp.com/go/DDR4memory-configurator

Each Intel® Xeon® E5-2600 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 16GB capacity DIMMs are supported for 256GB of memory (16 DIMM slots x 16GB per DIMM).
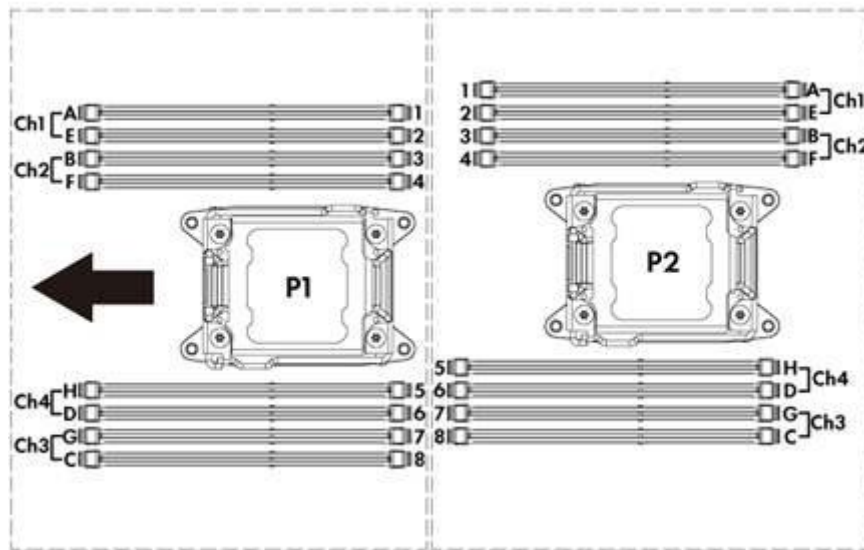
Memory Population Rules and Guidelines:

- 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.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and to load the channels similarly whenever possible.
- 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.
- RDIMMs operating at either 1.35V or 1.5V may be mixed in any order, but the system will power them at the higher voltage.
- 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.
- HP memory from previous generation servers is not qualified on the ProLiant XL730f Gen9
- Server. Certain HP SmartMemory features such as memory authentication and enhanced performance may not be supported.
- To realize the performance memory capabilities listed in this document, HP SmartMemory is required. For additional information, please see the HP SmartMemory QuickSpecs at:
  http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html.
- For memory population rules and additional memory guidelines, please see the ProLiant XL730f Gen9 User Guide at
  http://www.hp.com/support.

Memory

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

- 8GB = 8192MB
- 16GB = 16384MB

DDR4 memory options part number decoder
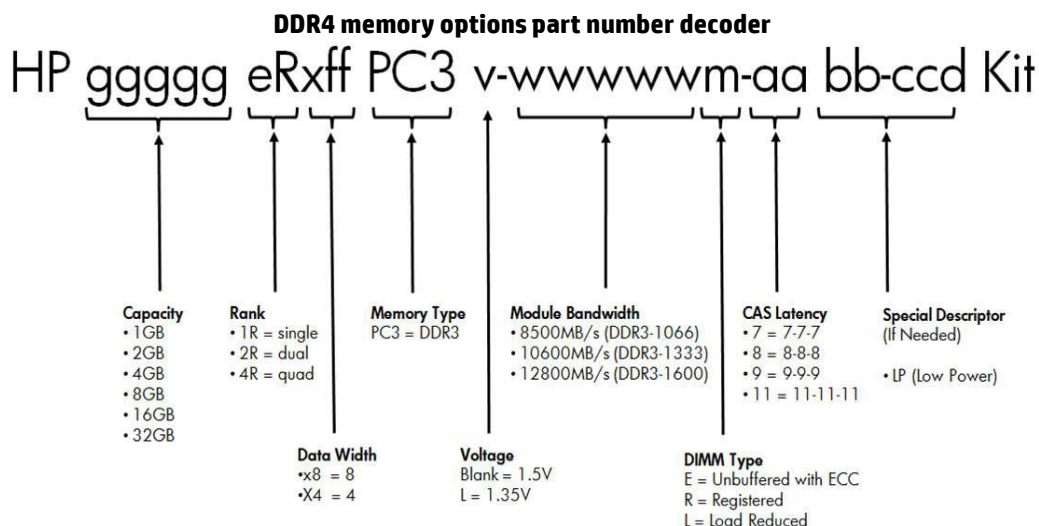
Following are memory options available from HP:

HP Memory

NOTE: HP memory from previous generation servers are not qualified or warranted with this HP ProLiant Server. HP SmartMemory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen9. For additional information, please see the HP SmartMemory QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/14225_na/14225_na.html.

Registered DIMMs (RDIMMs)
NOTE: The following memory is supported by the E5-2600 v3 series Processors.

HP 8GB (1x8GB) Single Rank x4 Registered Heat Spreader Memory Kit	778267-B21
HP 16GB (1x16GB) Dual Rank x4 Registered Heat Spreader Memory Kit	778268-B21

NOTE: This memory is only supported by the E5-2600 series Processors.

NOTE: For detailed memory configuration rules and guidelines, please use the Online DDR4 Memory Configuration Tool: www.hp.com/go/DDR4memory-configurator.

NOTE: Kits described as LP include Low Power DIMMs. For more information on ProLiant Energy Efficient Features, see: www.hp.com/go/proliant-energy-efficient.

Technical Specifications

Server Tray	Tray Dimensions (H x W x D)		1.75 x 7.9 x 38.27 in (4.45 x 20.07 x 98.98cm)
	Weight (approximate)	Maximum	30 lb (13.6 kg)
	Input Requirements (per power supply)	Power input provided by HP Apollo f8000 Rack	
	Power Supply Output (per power supply)	Rated Steady-State Power	600W per server
	System Inlet Temperature	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. 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) Maximum rate of change is 36°F/hr (20°C/hr).
	Altitude	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).
	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.		

HP Inifiniband FDR/Ethernet 10Gb/40Gb 2 port 544 AL Adapter	Network Interface	InfiniBand QDR, FDR10, and FDR; Ethernet 10 or 40 Gb/sec
	Compatibility	IEEE 802.1AS IEEE1588
		IEEE 802.3az
	Data Transfer Method	PCI Express v 3 x8 adapter
	Controller	Mellanox Connect X-3 Pro

Environment-friendly Products and Approach	End-of-life Management and Recycling	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to http://www.hp.com/go/green. To recycle your product, please go to: http://www.hp.com/go/green or contact your nearest HP sales office. Products returned to HP 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 web site at: http://www.hp.com/go/green. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.