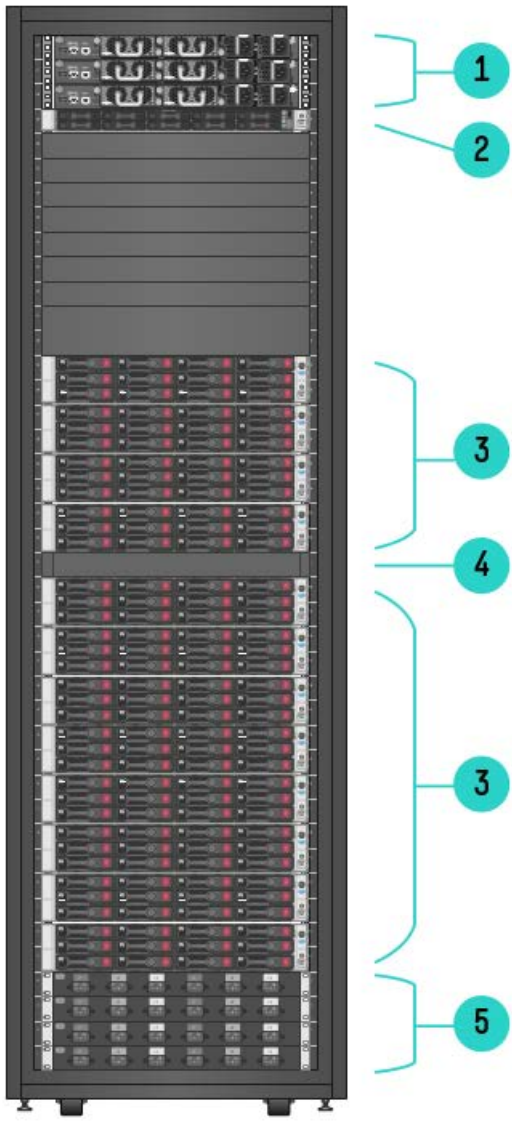
Overview

HPE ProLiant for Microsoft Azure Stack Gen9



Base Rack - Front View

1. Solution switches (3). Defaults: HPE Ethernet Switch 5900AF 48XG 4QSFP+ (2) and HPE Ethernet Switch 5900AF-48 G -4XG-2QSFP+ (1). Customers may optionally supply their own Cisco switches and equipment instead of HPE switches as directed by the parts listed in the table later in this document.
2. HPE ProLiant DL360 Gen9 with Microsoft Azure Stack hardware lifecycle host (1)
3. HPE ProLiant DL380 Gen9 with Microsoft Azure Stack Nodes (4-12)
4. Optional: 8 or 16 port KVM switch and optional LCD console (1)
5. Power Distribution Units (2 or 4)

At A Glance

The HPE ProLiant for Microsoft Azure Stack is a hybrid cloud solution that transforms on-premises datacenter resources into flexible hybrid cloud services that provide a simplified development, management and security experience that is consistent with Azure

Overview

public cloud services. The hybrid cloud solution is co-engineered by HPE and Microsoft to enable the easy movement and deployment of apps to meet security, compliance, cost and performance needs.

- Provide scaling up to 12 nodes per rack with minimum configuration of 4 nodes
- Based on industry-leading ProLiant servers with complete configuration flexibility – Cores, Memory, Storage - and unmatched memory scale up
- Factory integrated for quality and faster time-to-value, with on-site deployment to address your specific data center needs

While cloud architectures are growing fast with enterprises, not all workloads are suitable for public cloud. Data sovereignty, privacy, IP, compliance, performance and cost make public cloud infeasible or impractical for many organizations and applications. Unfortunately, this hasn't stopped many IT users from seeking out public cloud services, putting their companies at risk. Private and hybrid cloud solutions can bridge this gap, but designing, deploying, and operating them can be complicated, risky, and expensive. And if the new cloud doesn't meet the needs of the users, IT can find itself supporting something that no one uses, in addition to what they already support.

Enter HPE ProLiant for Microsoft Azure Stack. HPE and Microsoft are working together to deliver a hybrid cloud solution that delivers on the promised speed and agility benefits of public cloud, in a package that can be quickly and easily deployed in enterprise or service provider datacenters. This allows organizations to reap the benefits associated with cloud operating models, delivered in their own datacenters, by two of the biggest names in the industry.

How to Order

How to order HPE ProLiant for Microsoft Azure Stack

Start by determining the workloads and services you plan to host on Azure Stack. Your HPE account rep or channel partner can help guide you through the options regarding node count, node configuration, racking, services and support to arrive at a solution tailored to the specific needs of your business.

Complete solutions include:

- Two HPE Networking 5900 series top-of-rack switches
- One HPE Networking 5900 series management switch
- One HPE ProLiant DL360 Gen 9 hardware lifecycle host
- 4 – 12 configurable HPE ProLiant DL380 Gen 9 compute nodes
- Multiple racking options
- Multiple power options
- Optional KVM and LCD Console
- Factory integration
- On-site deployment
- Multiple options for Azure Stack and Azure Stack software support
- Multiple options for infrastructure support

Standard Features

Microsoft Azure Stack Software	The HPE ProLiant for Microsoft Azure Stack solution allows enterprises to host Azure-consistent services in their data center. This solution supports workload portability between on-premises Azure Stack and Azure public cloud, provides a consistent developer experience and allows you to meet security, compliance, performance and cost requirements. HPE offers a number of optional features including pay-as-you-go pricing, unified billing, single vendor support and analytics-driven, autonomous operations management along with professional services to help you plan and implement your Azure hybrid cloud. For more information, visit **azure.microsoft.com/en-us/overview/azure-stack/**
HPE ProLiant Servers, Networking, and Infrastructure	The **HPE ProLiant DL380 Gen9** server delivers the latest in performance, reliability, serviceability and near continuous availability. Designed to reduce cost and complexity, it leverages Intel's latest E5-2600 v4 processors, plus the latest 2400 MHz HPE DDR4 SmartMemory supporting up to 768 GB in Azure Stack configurations. The **HPE FlexFabric 5900 Switch Series** is a family of high performance and low-latency top-of-rack (ToR) datacenter switches. The HPE FlexFabric 5900 is optimized to meet the increasing requirements for higher-performance server connectivity, convergence of Ethernet and storage traffic, the capability to handle virtual environments, and low-latency. Better infrastructure means better business. HPE's stronger, smarter, simpler **rack and power infrastructure** will get you where you need to go—faster. For more information, visit: **http://www.hpe.com/qref/dl380gen9** **http://www.hpe.com/qref/dl360gen9** **https://www.hpe.com/us/en/product-catalog/networking/networking-switches/pip.fixed-port-l3-managed-ethernet-switches.5221896.html** **http://www.hpe.com/us/en/integrated-systems/rack-power-cooling.html**

Standard Features

HPE Factory Express and Deployment Services

Factory integration, on-site installation and deployment services, and end-to-end project management are included as part of the standard offering.
The service starts with factory integration of the infrastructure components: servers, storage, switches, and PDUs, which are racked and stacked, along with cabling and labeling. After configuring the hardware, the software is loaded. The components are then configured with the correct firmware and BIOS to conform to the latest validated specifications. Tests are conducted, and full diagnostics are performed before systems leave the factory.
Prior to the delivery of the solution, the following pre-delivery services are completed:

- Off-site coordination of readiness requirements, including identifying any prerequisites for deployment
- Provide documentation, including a system installation guide, a rack elevation drawing, a system interconnect drawing, and a hardware/software system configuration guide
- Schedule delivery of the on-site services

Following delivery of the solution, the following additional on-site services are delivered to complete the deployment and integration of the solution into the environment:

- On-site installation and start-up
  - Installation of the solution rack into the datacenter
  - Hardware check and visual acknowledgment that all hardware components have power
  - Cabling check to confirm all components are properly connected
  - Documentation check
- On-site pre-deployment
  - Evaluate and assist with retrofit of host network as necessary
  - Configure and connect the Azure Stack solution to host network
  - Install the Microsoft Azure Stack software
  - Apply patches and updates as necessary
- On-site post-deployment
  - Complete solution validation
  - Solution registration with a Microsoft Azure subscription
  - Update the hardware lifecycle host as necessary
  - Update the HPE OneView configuration as necessary
  - Update HPE Insight Remote Support configuration as necessary
  - Integrate Microsoft Azure Stack with Azure Active Directory or Active Directory Federation Services
  - Conduct a 4-hour orientation session providing an overview of the solution components, accompanying documentation, basic interactions with the Azure Stack portal and the supported configurable aspects of the HPE software components

Additional consulting services are available to cover requirements beyond those listed above.
For additional information, please contact your HPE account team, Pointnext representative, partner account manager, or visit:

HPE Factory Express: **http://www.hpe.com/info/factoryexpress**

HPE Pointnext Consulting services for Azure Stack: **http://www.hpe.com/us/en/services.html**

Azure Stack Deployment Services
datasheet: **http://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00005133enw**

HPE Support Services

Extensive collaboration between HPE and Microsoft means access to fast, professional support when you need it. Azure Stack core software support is provided through the Cloud Solution Provider program or via Microsoft Enterprise Agreement in one of three ways:

- Choose HPE as the CSP of record for unified support through the entire solution stack.

Standard Features

- Choose another Microsoft CSP partner to consolidate support around managed services, or existing partnership arrangements. HPE supports the infrastructure components for the full lifecycle of the offering.
- Utilize a Microsoft Enterprise agreement with an Azure endorsement. HPE supports the infrastructure components for the full lifecycle of the offering.

For additional information on the Microsoft Cloud Solution Provider program, visit:
partner.microsoft.com/en-US/cloud-solution-provider

HPE Proactive Care – 3, 4 or 5 Year
HPE Proactive Care is the minimum required support level for HPE ProLiant for Microsoft Azure Stack environments. It begins with providing all of the benefits of proactive monitoring and reporting along with access to Hewlett Packard Enterprise specially trained people to provide a complete solution-level support experience and put in place the fundamentals needed for stability and availability of the HPE ProLiant for Microsoft Azure Stack environment. Proactive Care helps in problem prevention, with predictive analytics, personalized analysis with recommendations and advice paired with rapid access to technical experts to help rapidly resolve any problem. You receive an enhanced call experience with advanced technical expertise, a single point of contact for the support of all components and end-to-end case ownership. You also benefit from the integrated reactive processes between Hewlett Packard Enterprise and Microsoft when the customer has an Enterprise Agreement with Microsoft.

Customers can customize their reactive support level by selecting either 6-hour call-to-repair, 24x7 with 4-hour onsite response or 9x5 Next Business Day onsite response.
NOTE: Proactive features of this service (twice yearly firmware, patch and software assessment, update recommendations) require the HPE Remote Support Technology tool suite. Some devices and configurations may not be supported by the technologies. In these instances, Hewlett Packard Enterprise will provide the steps required to collect the required information and send it to HPE so that those devices can be included in the reports. The current supported devices list is available as part of the release notes for Insight Remote Support found at **http://www.hpe.com/info/insightremotesupport**.

HPE Proactive Care Advanced – 3, 4 or 5 year
HPE Proactive Care Advanced builds on HPE Proactive Care, providing additional benefits such as the assignment of a dedicated, local account support manager (ASM) for collaboration, best practices and critical event management that provides fast response and IT service restoration with incident follow-up to prevent a repeat. All of this this is designed to give you an incredibly personalized, high-touch support experience that keeps your system fully available and running at peak performance.

HPE Proactive Care Advanced includes credits that you can use to select and fund the specialized service assistance you need, when you need it. You can choose from a range of predefined technical services on the HPE Pointnext Support Credits menu, or your ASM can work with you to define the specific advice or assistance you need.

HPE Datacenter Care
HPE Datacenter Care Service is HPE's most comprehensive support solution tailored to meet your specific data center support requirements. It offers a wide choice of proactive and reactive service levels to cover requirements ranging from the most basic to the most business-critical environments. A mutually agreed upon and executed Statement of Work (SOW) will detail the precise combination of reactive and proactive support features that will be provided under HPE Datacenter Care Service based upon your requirements.

The service includes an assigned account team led by a trained Hewlett Packard Enterprise Account Support Manager (ASM). The team's goal is to form a close working relationship with designated members of your IT staff and gain a clear understanding of your business objectives, key service-level agreements (SLAs), and the key performance indicators (KPIs) you need to meet. Delivery of the various

Standard Features

support options you have chosen will be overseen by the ASM and directed at meeting your goals.

HPE Update Service for HPE ProLiant for Microsoft Azure Stack:
Each HPE ProLiant for Microsoft Azure Stack is validated and tested to run a specific combination of software, firmware and drivers. Hewlett Packard Enterprise will release 6 monthly firmware updates aligned to the SPPs in April and October. There will also be updates available for the HPE software running on the Hardware Lifecycle Host server.

Customers may face a challenge in performing the HPE software and firmware update of their HPE ProLiant for Microsoft Azure Stack environment if they do not have the technical expertise. To address this challenge, Hewlett Packard Enterprise will launch a new Update Service for HPE ProLiant for Microsoft Azure Stack, which allows customers to engage HPE experts to implement HPE software and firmware updates quickly and efficiently, and reduce disruption to their IT environment.

HPE Pointnext Support Credits - 3, 4 or 5 Year
Adding Pointnext Support credits gives the customer the flexibility to bring in technical resources and expert assistance when they need it. It may be for a specific project or simply to implement HPE software and firmware update recommendations (see section 'HPE Update Service for HPE ProLiant for Microsoft Azure Stack' for more details).

HPE also highly recommends **HPE Education Services**, for customer training and education. Depending upon network integration requirements, optional **HPE Network Integration services** may be needed.

For additional information please visit:

HPE Support services: **http://www.hpe.com/services/support**
HPE Proactive Care services: **http://www.hpe.com/services/proactivecare**
HPE Education Services: **http://www.hpe.com/ww/learnproliant**
Technical Services: **http://www.hpe.com/services/technicalservices**

Warranty Services

The HPE ProLiant for Microsoft Azure Stack infrastructure is covered by a global limited warranty and supported by HPE Services and a worldwide network of Hewlett Packard Enterprise Authorized Channel Partners. As the HPE ProLiant for Microsoft Azure Stack is a solution made up of many components, the warranty across the different components will vary.

The HPE ProLiant for Microsoft Azure Stack requires customers to purchase a minimum of 3 year HPE Proactive Care NBD bringing the support service level of all components to a consistent level

HPE Financial Services

To support customers' transition, HPE Financial Services (HPFS) can help in a way that you may not have considered. HPFS can help you invest in your business while preserving precious capital.

For more information, contact your local HPE Financial Services Representative. In the United States, call 1-888-277-5942. In Canada, dial 1-800-HPE-LEASE. For more information please visit: **http://www.hpe.com/solutions/hpefinancialservices** for links to HPE Financial Services around the world.

Configuration Information - Factory Integrated Models

NOTES:

1. The software image will be installed at the factory. Client licenses are not included for VM- or container-based Azure Stack Services. Azure Stack service pricing is based on usage and billed by HPE, Microsoft, or the CSP of record.
2. Compute node configurations are identical for all nodes in a cluster.

Step 1: Configure the compute nodes

HPE Microsoft Azure Stack for ProLiant	HPE DL380 Gen9 with Microsoft Azure Stack Node • Minimum quantity 4, maximum 12. Includes the following: • One (1) HP ProLiant DL380 Gen9 12LFF Configure-to-order Server • Dual 480GB RI M.2 SSD boot devices • P840/4G Smart Array controller • Dual 800W Titanium-Certified Power efficiency hot swap power supplies • Cables, rail kit, optional security bezel • Node software	Q2B51A
CPU options per node	One of the following choices:	
	HPE DL380 Gen9 Intel® Xeon® E5-2699v4 (2.2GHz/22-core/55MB/145W)	(1) 817967-L21+ (1) 817967-B21
	HPE DL380 Gen9 Intel® Xeon® E5-2698v4 (2.2GHz/20-core/50MB/135W)	(1) 817965-L21+ (1) 817965-B21
	HPE DL380 Gen9 Intel® Xeon® E5-2695v4 (2.1GHz/18-core/45MB/120W)	(1) 817961-L21+ (1) 817961-B21
	HPE DL380 Gen9 Intel® Xeon® E5-2683v4 (2.1GHz/16-core/40MB/120W)	(1) 817953-L21+ (1) 817953-B21
	HPE DL380 Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W)	(1) 817945-L21+ (1) 817945-B21
	HPE DL380 Gen9 Intel® Xeon® E5-2650v4 (2.2GHz/12-core/30MB/105W)	(1) 817943-L21+ (1) 817943-B21
Memory options per node	One of the following choices:	
	256GB Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory	(8) 805351-B21
	384GB Dual Rank x4 + Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory	(8) 805351-B21 +(8) 805349-B21
	512GB Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory	(16) 805351-B21
	768GB Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Cost-optimized	(24) 805351-B21
	768GB Dual Rank x4 + Quad Rank x4 DDR4-2400 CAS-17-17-17 Load Registered Memory Performance-optimized	(8) 805353-B21 +(8) 805358-B21
Storage options per node	One of the following choices:	
	40TB Mixed-Use Hybrid Storage; 10x 4TB, 4x 960GB SSD	(10) 861752-B21+ (4) 875476-B21
	60TB Mixed-Use Hybrid Storage; 10x 6TB, 4x 1.92TB SSD	(10) 861750-B21+ (4) 875480-B21
	80TB Mixed-Use Hybrid Storage; 10x 8TB, 4x 1.92TB SSD	(10) 819203-B21+ (4) 875480-B21

Configuration Information - Factory Integrated Models

Step 2: Select Rack and Power Options

Rack choices

Select from a choice of Racks and Rack Options

HPE G2 Series Racks are designed specifically to support a wide range of HPE IT equipment (servers, storage, and networking) as well the entire portfolio of HPE Rack and Power Infrastructure solutions (PDU, UPS and KVM)

A choice of HPE G2 Enterprise or Advanced Series of racks or customer alternate racking models is offered

HPE G2 Enterprise Series Rack Models	
HPE 42U 600mmx1075mm G2 Enterprise Shock Rack	P9K38A
HPE 42U 600mmx1200mm G2 Enterprise Shock Rack	P9K40A
HPE G2 Advanced Series Rack Models	
HPE 42U 600mmx1075mm G2 Kitted Advanced Shock Rack with Side Panels and Baying	P9K08A
HPE 42U 600mmx1200mm G2 Kitted Advanced Shock Rack with Side Panels and Baying	P9K10A

NOTE: HPE offers alternate racking choices - please contact your HPE account team for more details

Power Distribution Units

Select the Power Distribution Units for the Rack

Choice of three phase or single phase Modular Power Distribution Unit (PDU)
HPE Modular PDUs have a unique modular architecture designed specifically for data center customers who want to maximize power distribution and space efficiencies in the rack. Modular PDUs consist of two building blocks - the Control Unit (core) and the optional Extension Bar(s) (sticks). The Core Unit is 1U/2U, and the optional Extension Bars mount directly to the frame of the rack in multiple locations. Available models range from 24A to 48A current ratings, with six IEC C19 output connections per core unit.

HPE Intelligent Power Distribution Units:

HPE Intelligent Modular 8.3kVA/CS8265C 40A/208V Outlets (6) C19/Horizontal NA/JP PDU	AF521A (2 or 4)
HPE Intelligent Modular 3Ph 8.6kVA/L15-30P 24A/208V Outlets (6) C19/Horizontal NA/JP PDU	AF522A (2 or 4)
HPE Intelligent Modular 3Ph 17.3kVA/60309 60A 4-wire 48A/208V (6) C19/Horizontal NA/JP PDU	AF523A (2)
HPE Intelligent Modular 7.3kVA/60309 3-wire 32A/230V Outlets (6) C19/Horizontal INTL PDU	AF525A (2 or 4)
HPE Intelligent Modular 3Ph 22kVA/60309 5-wire 32A/230V Outlets (6) C19/Horizontal INTL PDU	AF527A (2)

HPE Standard Series G2 Basic Power Distribution Units

HPE G2 Basic Modular 8.3kVA/CS8265C 40A/208V Outlets (6) C19/1U Horizontal NA/JP PDU	P9Q47A (2 or 4)
HPE G2 Basic Modular 3Ph 8.6kVA/L15-30P 24A/208V Outlets (6) C19/1U Horizontal NA/JP PDU	P9Q52A (2 or 4)
HPE G2 Basic Modular 3Ph 14.4kVA/CS8365C 40A/208V Outlets (6) C19/1U Horizontal NA/JP PDU	P9Q59A (2)
HPE G2 Basic Modular 3Ph 17.3kVA/60309 60A 4-wire 48A/208V Outlets (6) C19/1U Horizontal NA/JP PDU	P9Q60A (2)

Configuration Information - Factory Integrated Models

HPE G2 Basic Modular 3Ph 11kVA/60309 5-wire 16A/230V Outlets (6) C19/1U Horizontal INTL PDU	P9Q57A (2)
HPE G2 Basic Modular 3Ph 22kVA/60309 5-wire 32A/230V Outlets (6) C19/1U Horizontal INTL PDU	P9Q63A (2)

NOTE: PDUs that list a choice of 2 or 4 PDUs reflect that fewer 2 PDUs can be purchased when 11 or fewer HPE ProLiant for MS Azure Stack nodes are configured. Respectively when 12 nodes are configured 4 PDUs are required for PDU models rated at less than 9 kVA.

Select the Power Distribution Units Extension Bar

HPE 5xC13 Intelligent PDU Extension Bar G2 Kit	AF547A

NOTE: Recommended if Intelligent Power Distribution Units are selected.

HPE 5xC13 Outlets Power and UID LEDs Pair Standard Extension Bar	AF528A
HPE G2 IEC C20 Input/(8) C13 Expansion Outlets/PDU Extension Bar Kit	P9Q66A

NOTE: All kits include 2 extension bars with a locking C19 input power cord (1.8m).
NOTE: Intelligent Extensions Bars have individually monitored outlets that are also individually switchable for power cycling attached equipment. Each individual C13 outlet has Power Line Communications to support Intelligent Power Discovery when connected to PLC enabled common slot power supplies.
NOTE: Standard (non-intelligent) Extension Bars are monitored as a single load segment and do not support Intelligent Power Discovery.

Step 3: Choose HPE Support and Optional Services

HPE Support Services

There are two aspects to consider with respect to support for the HPE ProLiant for Microsoft Azure Stack: support for the core Azure Stack software and cloud services, and support for the infrastructure. Support for both components is required for the lifecycle of the solution.

Support for Azure Stack core software and cloud services may be obtained through HPE by choosing HPE to your Cloud Solution Provider (CSP). Support may also be obtained for Azure Stack and the associated cloud services through 3rd party Microsoft Cloud Solution Provider partners, or through Microsoft via an Enterprise Agreement that includes an Azure endorsement.

Support for the solution infrastructure components is available exclusively from HPE. 3yr Proactive Care NBD is the minimum required HPE support level with the option to upgrade to a higher support level to meet your business needs. In addition, customers may choose to purchase HPE Pointnext Support credits.

These support choices provide integrated support processes between HPE and Microsoft for seamless resolution of technical issue with the HPE ProLiant for Microsoft Azure Stack when the customer has an Enterprise Agreement with Microsoft.

A choice of HPE support services is available to meet your business needs. The minimum HPE support level is HPE Proactive Care (with a choice of 4 hour onsite response 24x7 or 6 hour call-to-repair).
NOTE: The minimum required support level is HPE Proactive Care 9x5 Next Business Day.

HPE Proactive Care - 3, 4 or 5 Year

HPE Proactive Care is the minimum required level of support for HPE ProLiant for Microsoft Azure Stack environments. It begins with providing all of the benefits of

Configuration Information - Factory Integrated Models

proactive monitoring and reporting along with rapid reactive care to put in place the fundamentals needed for stability and availability of the HPE ProLiant for Microsoft Azure Stack environment. Customers also receive enhanced reactive support for issues, through access to HPE's specialists working with Microsoft, as needed. It is available with 9x5 Next Business Day onsite response in three year (H1K90A3), four year (H1K90A4), and five year (H1K90A5), 24x7 4 hour onsite response (H1K92A3/4/5), and 6-hour Call-to-Repair (H1K94A3/4/5). It is also available with Defective Media Retention (H1K91A3/4/5, H1K93A3/4/5 & H1K95A3/4/5).

HPE Proactive Care Advanced – 3, 4 or 5 Year

HPE Proactive Care Advanced builds on HPE Proactive Care, providing additional benefits such as the assignment of a dedicated, local account support manager (ASM) for collaboration and best practices and critical event management that provides 24x7 fast response and IT service restoration with incident follow-up to prevent a repeat. All of this is designed to give you an incredibly personalized, high-touch support experience that keeps your system fully available and running at peak performance.

It is available with 9x5 Next Business Day onsite response in three year (H8B33A3), four year (H8B33A4), and five year (H8B33A5), 24x7 4 hour onsite response (H8B35A3/4/5), and 6-hour Call-to-Repair (H8B37A3/4/5). It is also available with Defective Media Retention (H8B34A3/4/5, H8B36A3/4/5 & H8B38A3/4/5).

HPE Datacenter Care

For large, complex environments where a more personalized, customized approach to support is needed. This is a contractual sale and provides one contract for all a customer's reactive and proactive needs.

HPE Optional Support Services

HPE Pointnext Support Credits - 3, 4 or 5 Year
Adding Pointnext Support credits gives the customer the flexibility to bring in technical resources and expert assistance when they need it. It may be for a specific project or simply providing help to implement HPE software and firmware update recommendations (see section 'HPE Update Service for HPE ProLiant for Microsoft Azure Stack' for more details).

Technical Specifications

Technical Specifications	**Dimensions** (per rack)	Height	42U, 78.816 in (200.19 cm)
		Width	23.535 in (59.78 cm)
		Depth	44.30 in (112.52 cm) or 51.19 in (130.02 cm)
	Shipping Dimensions (per rack, with packaging materials)	Height	85.35 in (216.80 cm)
		Width	35.43 in (90cm)
		Depth	50.87 in (129.20 cm)
	Maximum load	Rack	1280 lb (569 kg)
	Color	Doors	Black with Silver extrusion
		Frame	Black
	Clearance (for air flow and access)	Front	48 in (121.9 cm)
		Rear	30 in (76.2 cm)
	Temperature range	Operating	50° to 90° F (10° to 35° C)
		Non-Operating	-22° to 140° F (-30° to 60° C)
	Relative humidity	Operating	15 to 85% relative humidity (Rh)
	Altitude	Operating	3000 meters maximum.
	Sample Power Usage - Operating (per rack)	4 active nodes	3.9 kW (19.0A at 208V)
		8 active nodes	6.4 kW (26.8A at 208V)
		12 active nodes	8.8 kW (37.1A at 208V)
	Sample Power Usage - Idle (per rack)	4 active nodes	1.6 kW (7.7A at 208V)
		8 active nodes	2.4 kW (11.5A at 208V)
		12 active nodes	3.2 kW (15.4A at 208V)
	Sample BTU ratings, maximum (per rack)	4 active nodes	11900 BTU/hr
		8 active nodes	20300 BTU/hr
		12 active nodes	28600 BTU/hr

NOTE: Solution supports 4-12 nodes in any increment. Use of 4, 8, and 12 nodes samples represent a subset of choices available to help with power and thermal sizing. Adjustments to sample values can be done using per node values to match the configured number of nodes:

- Maximum power usage per node - 620 W
- Idle power usage per node – 204 W
- Maximum BTU per node – 2092 BTU/hr

Rack Airflow Requirements

- Front and rear doors: You must allow 830 square inches (5,350 sq. cm) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to a required 64 percent open area for ventilation).
- The clearance from face of rack to inside of the front door needs to be a minimum of 1.75".

Side: The clearance between the installed rack component and the side panels of the rack needs to be a minimum of 2.75 inches (7 cm).

Power Connections	**Three-Phase Power**	NA/Japan **or** International Option
	Minimum per rack	(2) CS8365C, (2) IEC 309 63A (2) NEMA L15-30P
	Maximum per rack	(2) CS8365C,

Technical Specifications

		(2) IEC 309 63A (4) NEMA L15-30P
	Single-Phase Power	NA/Japan **or** International Option
	Minimum per rack	(2) IEC 309 32A (2) CS8265C, or (2) IEC 309 63A
	Maximum per rack	(4) IEC 309 32A (4) CS8265C, or (2) IEC 309 63A

Optional Cisco switches and equipment to be provided by the customer:

Cisco switch (Qty 2)	N3K-C3172PQ-XL	Nexus 3172PQ-XL, 48 SFP+ and 6 QSFP+ ports
Cisco switch (Qty 1)	N3K-C3048-FA-L3	Nexus 3048TP-1GE, bundle with power supply, fans, Base & Enterprise licenses
Cisco power supplies (Qty 4)	N2200-PAC-400W	N2K/3K 400W AC Power Supply, Forward airflow (port side exhaust)
Cisco fans (Qty 8)	NXA-FAN-30CFM-F	Nexus 2K/3K single fan, Forward airflow (port side exhaust)
Cisco Base license (Qty 2)	N3K-BAS1K9	Nexus 3000 Layer 3 Base License
Cisco Enterprise license (Qty 2)	N3K-LAN1K9	Nexus 3000 Layer 3 LAN Enterprise License
Cisco TOR peer links (Qty 2)	QSFP-H40G-CU1M	40G QSFP, 1M
Cisco interconnects (Qty 6)	SFP-H10GB-CU1M	10G SFP+ Twinax, 1M
Cisco node cables (Qty 2 per compute node)	SFP-H10GB-CU3M	10G SFP+ Twinax, 3M
CAT6 Management cables (Qty 2)	861412-B21	HPE CAT6A 4ft Cable
Cisco TOR uplinks (Qty 4)	Subject to customer deployment environment	1GbE or 10GbE SFP+

	Location	**Connection Speed/Connection Type**
External Network Connections	HPE FlexFabric 5900AF 48XG 4 QSFP+ (Ethernet Switch 1)	10GbE / SFP+
	HPE FlexFabric 5900AF 48XG 4 QSFP+ (Ethernet Switch 2)	10GbE / SFP+
	HPE FlexFabric 5900AF 48G 4XG 2 QSFP+ (Ethernet Switch 1)	1 GbE / RJ45

NOTE: No direct sustained sunlight.
NOTE: The maximum load for the HPE Enterprise Series Rack is 3000 lb (1361 kg).
NOTE: The maximum load for the HPE Advanced Series Rack is 2500 lb (1133.98 kg)

Environmental-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.

Technical Specifications

For more information, visit: **http://www.hpe.com/info/recycle** 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/info/recycle**. These instructions may be used by recyclers and other WEEE treatment facilities as well as HEWLETT PACKARD ENTERPRISE OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change:
2-Apr-2018	Version 4	Changed	Overview, Configuration information - Factory Integrated Models, and Technical Specifications sections were updated.
04-Dec-2017	Version 3	Changed	Configuration Information - Factory Integrated Models section was updated.
06-Nov-2017	Version 2	Changed	Changes made to the document
05-Jun-2017	Version 1	Created	Document created

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