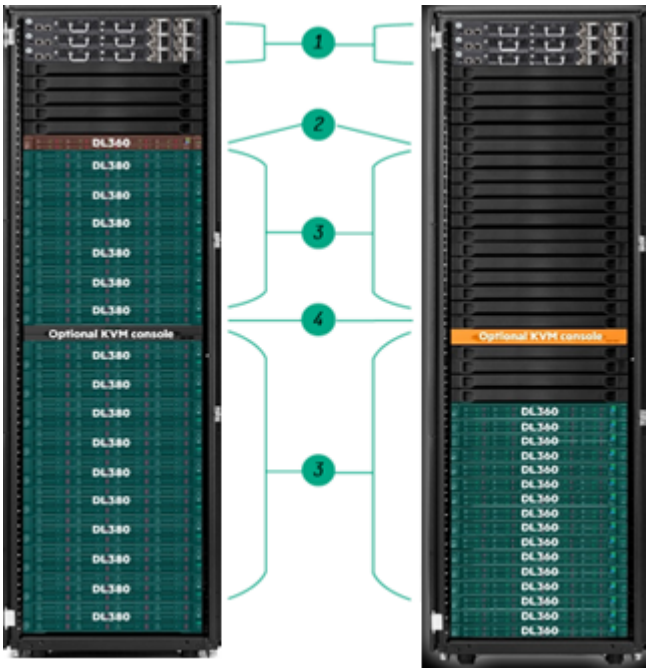
Overview

HPE ProLiant for Microsoft Azure Stack Hub



Base Rack - Front/Back View

1. Solution switches (3). Defaults: HPE FlexFabric Switch 5945 48SFP28 8QSFP28 (2) and HPE FlexFabric Switch 5900AF-48 G -4XG-2QSFP+ (1). Customers may optionally select Cisco switches.
2. HPE ProLiant DL360 Gen10 with Microsoft Azure Stack Hub hardware lifecycle host (1)
3. HPE ProLiant DL380 Gen10 with Microsoft Azure Stack Hub Hybrid or All-Flash Nodes (4-16)
4. Optional: 8 or 16 port KVM switch (1) and LCD8500 Rackmount Console (1)

Notes: Current solution supports 4-16 hybrid and All-Flash nodes in single server increments.

At A Glance

The HPE ProLiant for Microsoft Azure Stack Hub 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 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 from 4 nodes up to 16 Hybrid nodes or up to 16 All-Flash nodes* per rack, with single node scaling increments
- Based on industry-leading ProLiant DL380 or ProLiant DL360 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
- Networking performance capability at 25G.
- HPE OneView with infrastructure automation engine for hardware monitoring and lifecycle management tasks, providing dashboards with status and real-time alerts for the health of the underlying infrastructure.
- HPE ProLiant DL360 Gen10 Server as the hardware Lifecycle Host (HLH) used for solution deployment, monitoring, and management. The HLH is a Hyper-V host for the HPE OneView and HPE OneView Remote Support software management components.

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

Overview

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 Hub. 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.

Standard Features

Microsoft Azure Stack Hub Software

The HPE ProLiant for Microsoft Azure Stack Hub solution allows enterprises to host Azure-consistent services in their data center. This solution supports workload portability between on-premises Azure Stack Hub 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: **https://azure.microsoft.com/en-us/overview/azure-stack/**

HPE ProLiant Servers and Infrastructure

The HPE ProLiant DL380 Gen10 server delivers the latest in performance, reliability, serviceability and near continuous availability. Designed to reduce cost and complexity, it leverages Intel's latest 6200-series Gold and 8200-series Platinum Xeon processors (10-28 cores), plus the latest 2933 MHz HPE DDR4 SmartMemory supporting up to 1.5 TB in Azure Stack Hub configurations.

For more information, visit: **http:/www.hpe.com/qref/dl380gen10** and **http:/www.hpe.com/qref/dl360gen10** **https://buy.hpe.com/us/en/networking/networking-switches/hpe-flexfabric-5945-switch-series/p/1010907030**

The HPE ProLiant DL360 Gen10 Server supports the Intel® Xeon® Scalable Processor Family with up to 28 cores, plus 2933 MT/s HPE DDR4 SmartMemory. The HPE ProLiant DL360 Gen10 server also leverages Intel's latest 6200-series Gold and 8200-series Platinum Xeon Processors (10-28 cores). Deploy this dense platform for diverse workloads in space constrained, rack environments and maintain it with ease by automating the most essential server lifecycle management tasks with HPE OneView and HPE iLO 5.

For more information, visit: **http:/www.hpe.com/qref/dl360gen10** and **https://buy.hpe.com/us/en/networking/networking-switches/hpe-flexfabric-5945-switch-series/p/1010907030**

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/us/en/integrated-systems/rack-power-cooling.html**

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 by gathering details on how the Azure Stack Hub is to be deployed into the data center into a customer deployment worksheet [CDW]. HPE will provide guidance on required information. Upon receipt of the order, factory integration of the infrastructure components commences: servers, storage, switches, and PDUs, 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 and the solution customized using information contained within the CDW. Tests are conducted, and full diagnostics are performed before solution leaves the factory, customized to the customer's unique Azure Stack Hub requirements.
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

Standard Features

Following delivery of the solution, the following 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
- Installation of servers and switches into a customer rack if "onsite racking" into a customer's rack is selected and/or Cisco switches are selected
- Hardware check & visual acknowledgment that all hardware components have power
- Cabling check to confirm all components are properly connected

- On-site pre-deployment
  - Evaluate and assist with retrofit of host network as necessary
  - Configure and connect the Azure Stack Hub solution to host network
  - Install the Microsoft Azure Stack Hub 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 & the HPE OneView configuration as necessary
  - Update HPE OneView Remote Support configuration as necessary
  - Integrate Microsoft Azure Stack Hub 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 Hub Hub 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 Hub: **https://www.hpe.com/services/consulting**
- Azure Stack Hub Deployment Services datasheet: **http://www.hpe.com/h20195/v2/Getdocument.aspx?docname=a00005133enw**

Service and Support

HPE Pointnext - Service and Support

Get the most from your HPE Products. Get the expertise you need at every step of your IT journey with **HPE Pointnext Services**. We help you lower your risks and overall costs using automation and methodologies that have been tested and refined by HPE experts through thousands of deployments globally. HPE Pointnext **Advisory Services**, focus on your business outcomes and goals, partnering with you to design your transformation and build a roadmap tuned to your unique challenges. Our **Professional** and **Operational Services** can be leveraged to speed up time-to-production, boost performance and accelerate your business. HPE Pointnext specializes in flawless and on-time implementation, on-budget execution, and creative configurations that get the most out of software and hardware alike.

Consume IT on your terms

HPE GreenLake brings the cloud experience directly to your apps and data wherever they are-the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake accelerates digital transformation in a distributed, edge-to-cloud world..

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

Managed services to run your IT operations

HPE GreenLake Management Services provides services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

Free up resources with Operational Services from HPE Pointnext Services

HPE delivers services for IT by using proven best practices as well as automation and methodologies that have been tested and refined by HPE experts and artificial intelligence through thousands of deployments globally. Choose from the recommended services for customers purchasing from Hewlett Packard Enterprise or an authorized reseller. Services are quoted using Hewlett Packard Enterprise order configuration tools.

HPE Pointnext Tech Care

HPE Pointnext Tech Care is the new operational service experience for HPE products. Tech Care goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Pointnext Tech Care has been reimagined from the ground up to support a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Pointnext Tech Care is available in three response levels. Basic, which provides 9x5 business hour availability and a 2 hour response time. Essential which provides a 15 minute response time 24x7 for most enterprise level customers, and Critical which includes a 6 hour repair commitment where available and outage management response for severity 1 incidents.

https://www.hpe.com/services/techcare

HPE Pointnext Complete Care

HPE Pointnext Complete Care is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimizing your entire IT environment and achieving agreed upon IT outcomes and business goals through a personalized and customer-centric experience. All delivered by an assigned team of HPE Pointnext Services experts. HPE Pointnext Complete Care provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement

Service and Support

- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

HPE Support Services

Extensive collaboration between HPE and Microsoft means access to fast, professional support when you need it. Azure Stack Hub 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.
- 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:
https://partner.microsoft.com/en-US/cloud-solution-provider

HPE Add-node Service

When adding a compute node (Gen10 - Q8N42A#101) to an existing HPE ProLiant for Microsoft Azure Stack Hub appliance; the mandatory Add Node service (HA124A1#5RA) provides onsite node hardware install into rack, and requisite updates to HPE Management tools & switch configurations; the customer however, is responsible for the logical addition of the new compute node via the Azure Stack Hub user interface.

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

HPE ProLiant for Microsoft Azure Stack Hub Update Bundle Startup Service

Solution update bundles for HPE ProLiant for Microsoft Azure Stack Hub are released periodically by Hewlett Packard Enterprise to Customers who have active HPE support service coverage for their HPE ProLiant for Microsoft Azure Stack Hub. These update bundles may include firmware and driver updates for the Azure Stack nodes and the hardware lifecycle host (HLH) management node, HPE OneView updates, security fixes, new solution management tools, and supported third-party tools.
This service provides for a choice of either remote or on-site deployment of one HPE solution update bundle for HPE ProLiant for Microsoft Azure Stack Hub.

- HA124A1#V0B-HPE Microsoft Azure Stack Hub On-site Solution Update Bundle Startup Service
- HA124A1#V0C-HPE Microsoft Azure Stack Hub Remote Solution Update Bundle Startup Service

For additional information please visit: **https://psnow.ext.hpe.com/doc/a50001227ENW.pdf**

HPE GreenLake Capacity Analytics

HPE GreenLake Capacity Analytics with Microsoft Azure

This "best of both worlds" solution combines all the benefits of on-premises IT and public cloud to deliver a true Hybrid IT consumption model. Using the ProLiant for Azure Stack Hub with HPE GreenLake Capacity Analytics delivers consumption-based economics and scalability within the boundaries of Microsoft Azure Stack Hub. Unlike product financing offers, HPE GreenLake Flex Capacity provides active capacity management, variable monthly payments based on metered usage, and services to make Hybrid IT simpler.

Service and Support

HPE GreenLake Flex Capacity with Microsoft Azure Features.

- Pay per use for Hybrid IT-The cost for your IT usage is based on actual metered consumption of Azure Stack Hub on-premises or in Microsoft Azure public cloud.
- A single contract for your on-premises servers, storage, networking, operating software, and certain Microsoft Azure public cloud and Azure Stack Hub services.

- A single monthly invoice that combines the usage from resources in your data center and in Microsoft Azure public cloud.
- A single usage portal and reporting of the services you use and the capacity you consume so that you can understand usage and plan for the future.
- A single enterprise-grade support experience with HPE Datacenter Care; HPE Datacenter Care is the basis for HPE GreenLake Flex Capacity, providing support and guidance for your IT environment. We extend this support to include Microsoft Azure, with one accountable partner.

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 Education Services: **http://www.hpe.com/ww/learnproliant**

Warranty Services

The HPE ProLiant for Microsoft Azure Stack Hub 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 Hub is a solution made up of many components, the warranty across the different components will vary.

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

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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

How to order HPE ProLiant for Microsoft Azure Stack Hub

Start by determining the workloads and services you plan to host on Azure Stack Hub. 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 5945 series top-of-rack switches
- One HPE Networking 5900 series management switch
- One HPE ProLiant DL360 Gen 10 hardware lifecycle host management node
- 4 - 16 configurable HPE ProLiant DL380 Gen 10 hybrid or All Flash compute nodes or
- 4 - 16 configurable HPE ProLiant DL360 Gen10 All-Flash compute nodes
- Multiple racking options
- Multiple power options
- Optional KVM and LCD Console
- Factory integration
- Multiple options for Azure Stack Hub and Azure Stack Hub software support
- On-site deployment services included
- Expansion node options

Notes:

– The solution supports scaling in single server increments. Any number of nodes between the min/max range can be ordered.

– Customers can also order a single HPE ProLiant DL360 Gen10 POC node for POC purposes. Production workloads are not supported on POC node.

Factory Integrated Models

Notes: The software image will be installed at the factory. Client licenses are not included for VM- or container-based Azure Stack Hub Services. Azure Stack Hub service pricing is based on usage and billed by HPE, Microsoft, or the CSP of record.

Step 1: Configure the compute nodes

HPE DL380 Gen10 with Microsoft Azure Stack Node Q8N42A

Minimum quantity 4, maximum 16. Each node will include the following:

- One (1) HPE ProLiant DL380 Gen10 12LFF Configure-to-order Server
- Dual M.2 RI SSD mirrored boot devices
- E208i-a Smart Array Controller and HPE DL38X Gen10 12Gb SAS Expander to support the software defined storage environment
- Dual 1600W Platinum-Certified Power efficiency hot swap power supplies
- Microsoft Azure Stack Hub node software, cables, rail kit, and optional bezel

Notes: Compute node configurations are identical for all nodes in a cluster.

HPE DL380 Gen10 with Microsoft Azure Stack All Flash Node R1D93A

Minimum quantity 4, maximum 16. Each node will include the following:

- One (1) HPE ProLiant DL380 Gen10 12 or 16 SFF Configure-to-order Server
- Dual SFF RI SSD mirrored boot devices
- HPE Smart Array P816i-a HBA to support the software defined storage environment
- Dual 1600W Platinum-Certified Power efficiency hot swap power supplies
- Microsoft Azure Stack Hub node software, cables, rail kit, and optional bezel
- Optional GPU support with NVIDIA T4 or NVIDIA V100S

Notes: Compute node configurations are identical for all nodes in a cluster.

Configuration Information

HPE ProLiant DL360 Gen10 with Microsoft Azure Stack All Flash Node R4C79A
Minimum quantity 4, maximum 16. Each node will include the following:

- One (1) HPE ProLiant DL360 Gen10 8 SFF Configure-to-order Server
- Dual SFF RI SSD mirrored boot devices
- HPE Smart Array E208i-a SR Gen10 HBA to support the software defined storage environment
- Dual 1600W Platinum-Certified Power efficiency hot swap power supplies
- Microsoft Azure Stack Hub node software, cables, rail kit, and optional bezel

Notes: Compute node configurations are identical for all nodes in a cluster.

Gen10 Intel® Xeon® Processor Model (X2)	CPU Frequency	Cores	Power (Watts)	L3 Cache	UPI	DDR4
S4114	2.2GHz	10	85W	13.75MB	2 @ 10.4 GT/s	2400 MT/s
5115-G	2.4GHz	10	85W	13.75MB	2 @ 10.4 GT/s	2400MT/s
6126-G	2.6GHz	12	125W	19.25MB	3 @ 10.4 GT/s	2666 MT/s
6130-G	2.1GHz	16	125W	22.0MB	3 @ 10.4 GT/s	2666 MT/s
6132-G	2.6GHz	14	140W	19.25MB	3 @ 10.4 GT/s	2666 MT/s
6138-G	2.0GHz	20	125W	27.50 MB	3 @ 10.4 GT/s	2666 MT/s
6140-G	2.3GHz	18	140W	24.75 MB	3 @ 10.4 GT/s	2666 MT/s
6143-G	2.8GHz	16	205W	22.0MB	3 @ 10.4 GT/s	2666 MT/s
6148-G	2.4GHz	20	150W	27.50 MB	3 @ 10.4 GT/s	2666 MT/s
6150-G	2.7GHz	18	165W	24.75 MB	3 @ 10.4 GT/s	2666 MT/s
6152-G	2.1GHz	22	140W	30.25 MB	3 @ 10.4 GT/s	2666 MT/s
6154-G	3.0GHz	18	200W	24.75 MB	3 @ 10.4 GT/s	2666 MT/s
8153-P	2.0GHz	16	125W	22.00 MB	3 @ 10.4 GT/s	2666 MT/s
8160-P	2.1GHz	24	150W	33.00 MB	3 @ 10.4 GT/s	2666 MT/s
8164-P	2.0GHz	26	150W	35.75 MB	3 @ 10.4 GT/s	2666 MT/s
8165-P	2.3GHz	24	205W	33.00MB	3 @ 10.4 GT/s	2666 MT/s
8168-P	2.7GHz	24	205W	33.00 MB	3 @ 10.4 GT/s	2666 MT/s
8176-P	2.1GHz	28	165W	38.50 MB	3 @ 10.4 GT/s	2666 MT/s
8180-P	2.5GHz	28	205W	38.50 MB	3 @ 10.4 GT/s	2666 MT/s

Configuration Information

Gen10 Intel® Xeon® Processor Model (2nd Gen)	CPU Frequency	Cores	Power (Watts)	L3 Cache	UPI	DDR4
S4210	2.2GHz	10	85W	10MB	2 @ 9.6 GT/s	2400 MT/s
5218-G	2.3GHz	16	125W	22MB	2 @ 10.4 GT/s	2666 MT/s
6230-G	2.1GHz	20	125W	27.5MB	3 @ 10.4 GT/s	2933 MT/s
6240-G	2.6GHz	18	150W	24.75 MB	3 @ 10.4 GT/s	2933 MT/s
6242-G	2.8GHz	16	150W	22.0MB	3 @ 10.4 GT/s	2933 MT/s
6248-G	2.5GHz	20	150W	27.50 MB	3 @ 10.4 GT/s	2933 MT/s
6252-G	2.3GHz	24	150W	35.75 MB	3 @ 10.4 GT/s	2933 MT/s
6254-G	3.1GHz	18	200W	24.75 MB	3 @ 10.4 GT/s	2933 MT/s
8253-P	2.2GHz	16	125W	22.00 MB	3 @ 10.4 GT/s	2933 MT/s
8260-P	2.4GHz	24	165W	35.75 MB	3 @ 10.4 GT/s	2933 MT/s
8268-P	2.9GHz	24	205W	35.75 MB	3 @ 10.4 GT/s	2933 MT/s
8270-P	2.7GHz	26	205W	35.75 MB	3 @ 10.4 GT/s	2933 MT/s
8276-P	2.2GHz	28	165W	38.50 MB	3 @ 10.4 GT/s	2933 MT/s
8280-P	2.7GHz	28	205W	38.50 MB	3 @ 10.4 GT/s	2933 MT/s

One of the following choices:

Notes:

- Memory configurations up to and including 768GB require 480GB mirrored boot drives. Larger memory configurations over 768GB (including 768GB "upgradable") require 960GB mirrored boot drives.
- 256GB memory option offers 33% less memory throughput as compared to other options. For details see: **http://www.hpe.com/docs/memory-population-rules**

Compute Node Memory Option	16GB (Single Rankx4) DDR4-2933 CAS-21-21-21 R-DIMM	32GB (Dual Rankx4) DDR4-2933 CAS-21-21-21 R-DIMM	64GB (Quad Rankx4) DDR4-2933 CAS-21-21-21 R-DIMM
256GB	N/A	8	N/A
384GB	N/A	12	N/A
576GB	12	12	N/A
768GB	N/A	24	N/A
768GB (upgradable)	N/A	12	
1152	N/A	12	12
1.5TB	N/A	24	

Configuration Information

One of the following choices: (DL380 Gen10 Hybrid)

Hybrid Compute Node Storage Option	HDD Type/Size and Count	SSD Type/Size and Count
48 TB with 10% Cache	12x4TB SAS 512n **7.2K RPM**	6x800GB SAS MU
72 TB with 13.3% Cache	12x6TB SAS 512e **7.2K RPM**	6x1.6TB SAS MU
96 TB with 10% Cache	12x8TB SAS 512e **7.2K RPM**	6x1.6TB SAS MU
96 TB with 20% Cache	12x8TB SAS 512e **7.2K RPM**	6x3.2TB SAS MU
120 TB with 16% cache	12x10TB SAS 512e **7.2K RPM**	6x3.2TB SAS MU

One of the following choices: (DL380 Gen10 All Flash)

All-Flash Compute Node Storage Option	SSD Type/Size and Count
12.8 TB	16x800GB SAS MU
19.2TB	12x1.6TB SAS MU
25.6TB	16x1.6TB SAS MU
38.4TB	12x3.2TB SAS MU
51.2TB	16x3.2TB SAS MU
76.8TB	12x6.4TB SAS MU
102.4TB	16x6.4TB SAS MU

One of the following choices: (DL360 Gen10 All Flash)

12.8TB	8x1.6TB SAS MU
25.6TB	8x3.2TB SAS MU
51.2TB	8x6.4TB SAS MU

Optional CPU choices for DL380 Gen10 All Flash:

NVIDIA Tesla T4	Quantity 1, 2, or 4
NVIDIA V100S	Quantity 1 or 2

Additional memory requirement considerations for GPU workloads:

GPU model	GPU Quantity per server	Minimum workload memory	Example memory per node
NVIDIA Tesla T4	1	28	384
	2	56	576
	4	112	576
NVIDIA V100S	1	112	576
	2	224	768

After making the selections above, select the required number of compute nodes and proceed to step 2.

Configuration Information

Step 2: Select Rack and Power 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 Advanced Series of racks or customer alternate racking models is offered:

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

Alternate Rack Choices

HPE understands that datacenters sometimes have predefined standards for racks. As a result, we offer and support alternate racking choices - please contact your HPE account team for more details as there may be additional services required.

Power Distribution Units

Select the Power Distribution Units for the Rack

Choice of vertically mounted three phase or single phase G2 standard and metered Power Distribution Unit (PDU)

Both HPE Advanced Series G2 Metered PDUs and HPE Standard Series G2 Basic PDUs are designed to work precisely with HPE Infrastructure and Compute solutions and guarantee a compatible fit for use with HPE Standard, Advanced, and Enterprise racks (and compatible with other industry-standard server racks). Built with high-temperature grade premium components, HPE G2 PDUs can operate in temperatures up to 60°, adding an increased level of operational reliability for power distribution in IT racks.

A major concern for IT administrators and facility managers is their ability to quickly diagnose and service power related problems in their IT racks. The HPE G2 PDU portfolio addresses this problem by, first, offering a wide range of models and mounting options that promote flexible power configuration in IT racks. Serviceability is further enhanced with features such as color-coded outlets and low-profile form factors, allowing for simple and quick access to IT equipment and power cables in the rear of the rack.

HPE G2 Metered PDU features are also directly focused on other pain points in the data center by providing a highly accurate (billing grade accuracy) power distribution and metering solution. 1Gb Ethernet alleviates the need to maintain older switch solutions that have been traditionally required for PDU network connectivity. High-density outlet configurations that provide up to 48 power outlets in a full-height vertical form factor allow for simple access to power in the rack while minimizing physical cable requirements. Support for up to eight sensors per PDU provides a cost-effective and exhaustive solution for monitoring the environmental elements (temperature, humidity, and leakage) in both the front and rear of the rack.

Available models range from 24A to 60A current ratings, in the half-height, mid-height, and full-height vertical form factors. The default PDU choices have been selected to support the maximum of devices to be powered within a 42U rack. Should alternate choices be required - please contact your HPE account team.

Step 3: Select Network Switch Options

A choice between pre-configured solution certified sets of HPE Flex Fabric and Cisco switches is offered to act as the solution Top-of-Rack and management switches.

HPE Flex Fabric Switch Set (default)

Configuration Information

The HPE FlexFabric 5945 Switch Series is a family of high performance and low-latency top-of-rack (ToR) datacenter switches. The HPE FlexFabric 5945 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.

HPE FlexFabric 5945 48SFP28 8QSFP28 Switch JQ074A
HPE FlexFabric 5900AF 48G 4XG 2QSFP+ Switch JG510A

Notes:

– Switch quantities are fixed at 2 TOR and 1 management switches per solution
– Networking cable and transceivers are fixed with exception of transceivers for external connectivity with options noted below

TOR external connection options

HPE X120 1G SFP RJ45 T Transceiver JD089B
HPE X190 25G SFP28 LC SR 100m MM Transceiver JL293A

Notes: 4 Transceivers from supported list (above) must be selected for HPE TORs. Transceivers and fiber that are respectively supported by the customer provided border/edge switch must be purchased separately.

Cisco Datacenter Switch Set

The platforms provide investment protection for customers, delivering large buffers, highly flexible Layer 2 and Layer 3 scalability, and performance to meet the changing needs of virtualized data centers and automated cloud environments. Used in the Microsoft Azure Cloud they are now available in Microsoft Azure Stack Hub configurations. Cisco switches are also US TAA (Trade Agreements Act) compliant that is required to sell products into the US Federal market.

For additional information around Cisco, please visit:
https://www.cisco.com/c/en/us/products/collateral/switches/nexus-9000-series-switches/datasheet-c78-736651.html

- **Cisco Nexus N9K-C93180YC-EX** Switch (used for TOR switches)
- **Cisco Nexus N9K-C9348GC-FXP** Switch (used for Management switch)

Notes:

– Switch quantities are fixed at 2 TOR and 1 management switches per solution
– Networking cable and transceivers are fixed with exception of transceivers for external connectivity with options noted below
– For customers ordering the Cisco Networking option, the quote will include HPE Pointnext onsite switch hardware installation SKU HM9R3A1#003 at quantity per switch.
– It is the responsibility of the customer to order hardware support for their Cisco switches from their switch vendor at time of purchase

TOR and BMC required parts

Part	Quantity	Part Number	Description
TOR 25GbE switch	2	**N9K-C93180YC-EX**	Nexus 9300 w/48p 10/25G, & 6p 100G(port side exhaust fan/PS)
TOR OS	2	NXOS-703IM3.3	Nexus 9500, 9300, 3000 Base NX-OS Software Rel 7.0(3)IM3(3)
TOR parts kit	2	N3K-C3064-ACC-KIT	Nexus 3K/9K Fixed Accessory Kit
TOR fans	8	NXA-FAN-30CFM-F	Nexus 2K/3K/9K Single Fan, port side exhaust airflow
TOR power supply	4	NXA-PAC-650W-PE	Nexus NEBs AC 650W PSU - Port Side Exhaust
TOR power cables	2	CAB-C13-CBN	Cabinet Jumper Power Cord, 250 VAC 10A, C14-C13 Connectors
TOR license	2	N93-LIC-PAK	N9300 License PAK Expansion
TOR license	2	N93-LAN1K9	LAN Enterprise License for Nexus 9300 Platform
TOR MGMT cable	2	861412-B21	HPE CAT6A 4ft Cable
TOR peer links QSFP28	2	QSFP-100G-CU1M	100G QSFP28 Twinax, 1M

Configuration Information

TOR BGP/heartbeat SFP28	2	SFP-H25G-CU1M	25G SFP28 Twinax, 1M
TOR-to-Server	2/node	SFP-H25G-CU3M	25G SFP28 Twinax, 3M
BMC switch	1	**N9K-C9348GC-FXP**	Cisco Nexus 9348GC-FXP Switch (48G, 4x25G, 2x100G)
BMC-HLH	2	SFP-H10GB-CU1M	10G SFP+ Twinax, 1M
BMC uplinks	2	SFP-H10GB-CU1M	10G SFP+ Twinax, 1M
BMC-to-iLO	1/node	861413-B21	HPE CAT6 10ft cable

TOR external connection options

SFP-10G-SR Cisco SFP-10G-SR Compatible 10GBASE-SR SFP+ 850nm 300m DOM Transceiver

SFP-25G-SR-S Cisco SFP-25G-SR-S Compatible 25G SFP28 850nm 100m DOM Transceiver

Notes: 4 Transceivers from supported list (above) must be selected for Cisco TORs. Transceivers and fiber that are respectively supported by the customer provided border/edge switch must be purchased separately.

Configuring Expansion Nodes

HPE DL380 Gen10 MAS Exp Node Q8N42A#101

Hewlett Packard Enterprise recommends that you consider the CPU, memory, and storage growth rates of your workload when performing solution sizing and purchasing sufficient capacity in each scale unit to meet future workload demands.

Adding nodes to an existing scale unit is supported subject to the following limitations:

- The existing scale unit has been updated to a version of Microsoft Azure Stack Hub that supports the "Add
- Node" capability[1].

The maximum number of compute nodes is limited to the current maximum for your system (16).

- All compute nodes must be configured identically, including CPUs, memory, and storage resources. Please refer to step 1 above to order the expansion nodes.
- Expansion nodes come as stand-alone nodes and do not come with rack and power.
- HPE Power Advisor should be utilized to confirm that the existing PDUs will be sufficient.
- The mandatory Add Node service from HPE Pointnext Operational Services must be used to provide onsite node hardware installation into the rack and requisite updates to HPE Management tools and switch configurations.
- The customer is responsible for the logical addition of the new compute node(s) through the Azure Stack user interface.

HPE ProLiant DL360 Gen10 Single Microsoft Azure Stack Hub POC node

For customers wanting to have a "try before buy" Microsoft Azure Stack Hub experience.

HPE DL360 Gen10 with Microsoft Azure Stack Single POC Node R2D99A

For customers wanting to get an Azure Stack Hub experience before making the investment on a multi-node solution, HPE offers a single POC Azure Stack Hub node. Microsoft provides the Azure Stack Hub Development Kit (ASDK) that can be customer installed to evaluate and learn about Azure Stack Hub. You can also use ASDK as a developer environment to build apps using the APIs and tooling that's consistent with Azure. The POC node details are below. The single POC Azure Stack Hub node is covered by Foundation Care hardware support only. ASDK is supported by Microsoft.

Microsoft has more information on the ASDK at: **https://docs.microsoft.com/en-us/azure/azure-stack/azure-stack-poc**

- One (1) HPE ProLiant DL360 Gen10 4 SFF Configure-to-order Server
- Dual HPE DL360 Gen10 Intel Xeon-Silver 4110 (2.1GHz/8-core/85W) FIO Processor Kit
- 192GB RAM (12xHPE 16GB 2Rx8 PC4-2666V-R Smart Kit)
- 2x HPE 480GB SATA 6G Read Intensive SFF (Cache device)
- 4xHPE 1TB SATA 7.2K SFF SC DS HDD (Capacity devices)

Configuration Information

- Single 240GB RI SATA SSD boot device
- E208i-a Smart Array Controller
- Dual 500W Platinum-Certified Power efficiency hot swap power supplies
- Rail kit

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 (90 cm)
	Depth	57.87 in (147 cm)
Maximum load	Rack	1320 lb (587 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 86° F (10° to 30° 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 8 active nodes 12 active nodes 16 active nodes*	5.3 kW (22.6A at 208V) 9.0 kW (40.6A at 208V) 12.8 kW (61.5A at 208V) 16.5 kW (79.2A at 208V)
Sample Power Usage -Idle* (per rack)	4 active nodes 8 active nodes 12 active nodes 16 active nodes*	1.8 kW (8.7A at 208V) 2.8 kW (13.5A at 208V) 3.8 kW (18.3A at 208V) 4.8 kW (23.1A at 208V)
Sample BTU ratings, maximum* (per rack)	4 active nodes 8 active nodes 12 active nodes 16 active nodes*	18000 BTU/hr 30700 BTU/hr 43500 BTU/hr 56300 BTU/hr

Notes:

– *Use of 4, 8, 12 and 16 nodes samples represent a subset of choices available to help with power and thermal sizing. Sample values are representative of a solution configured with maximum cpu, memory, and storage configuration and may not be representative of other supported configuration options.

– *To obtain configuration specific server power and thermal sizing estimates for facilities planning purposes use the HPE Power Advisor at: **https://paonline56.itcs.hpe.com/?Page=Index.**

– *For G2 metered PDUs, 1200mm rack depth is required.

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).

External Network Connections	**Location**	**Connection Speed / Connection Type**
	TOR	(4) 25GbE / SFP28 (4) 10GbE / SFP+ (default) (4) 1 GbE / SFP+
	BMC	(1) 1 GbE / RJ45

Notes:

– No direct sustained sunlight.

– The maximum load for the HPE Advanced Series Rack is 2500 lb (1133.98 kg).

Technical Specifications

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. 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
04-Oct-2021	Version 16	Changed	Service and Support Pointnext Tech Care and Complete Care information updated
02-Aug-2021	Version 15	Changed	Service and Support Pointnext information added
21-Jun-2021	Version 14	Changed	Added GPU details Configuration Information section was updated
04-May-2021	Version 13	Changed	Rebranding applied
03-Feb-2020	Version 12	Changed	Overview and Configuration Information sections were updated.
06-Jan-2020	Version 11	Changed	Added DL360 Gen10 content for description, order, storage.
04-Nov-2019	Version 10	Changed	Overview, Standard Features, and Configuration Information sections were updated.
10-Jul-2019	Version 9	Changed	Overview, Standard Features and Configuration Information sections were updated.
06-May-2019	Version 8	Added	Overview and Configuration Information - Factory Integrated Models sections were updated: added support for Cisco switches
04-Mar-2019	Version 7	Changed	Overview, How to Order, Standard Features, and Configuration Information - Factory Integrated Models sections were updated. SKU added in Configuration Information - Factory Integrated Models section: R2D99A.
09-Dec-2018	Version 6	Added	Overview, How to Order, and Configuration Information - Factory Integrated Models SKU added in Configuration Information - Factory Integrated Models section: R1D93A.
05-Nov-2018	Version 5	Changed	Overview, How to Order, Standard Features, Configuration Information - Factory Integrated Models, and Technical Specifications sections were updated. SKUs added in Configuration Information - Factory Integrated Models section: JH402A, JG510A, JD089B, JL437A, JL293A, JH948A, JQ085A, JH650A, JH645A, JH647A, JH991A, JH992A.
01-Oct-2018	Version 4	Changed	Overview, How to Order, Standard Features, and Configuration Information - Factory Integrated Models sections were updated.
06-Aug-2018	Version 3	Changed	How to Order; Standard Features; Services and Support; and Configuration Information - Factory integrated Models sections were updated. SKUs added: Q8N42A#101, Q8N42A
02-Jul-2018	Version 2	Changed	Overview, How to Order, Standard Features, Configuration Information - Factory Integrated Models, and Technical Specifications sections were updated SKU added: Q8N42A SKU deleted: Q2B51A
04-Jun-2018	Version 1	Created	New QuickSpecs

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

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