

# HPE ProLiant DL380 Gen10 Solutions for Microsoft Azure Stack HCI

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## Introduction

This technical white paper provides solution guidelines and example configurations for Azure Stack [hyperconverged infrastructure \(HCI\)](#) solution on HPE ProLiant DL380 Gen10 servers. These cluster solutions can be deployed on Windows Server 2019 or Azure Stack HCI Operating System. HPE has certified the following solutions that optimize Storage Spaces Direct based virtualized storage for efficiency and performance.

- All-Flash SATA SSD Capacity
- All-Flash SAS SSD Capacity
- All-Flash NVMe Capacity
- Hybrid SATA SSD Cache/SAS HDD Capacity
- Hybrid SAS SSD Cache/SAS HDD Capacity
- Hybrid NVMe Cache/SAS SSD Capacity or SAS HDD Capacity or SAS SSD + SAS HDD Capacity
- Hybrid Persistent Memory Cache/SAS SSD Capacity

## Azure Stack HCI solution management

HPE offers unique Microsoft Windows Admin Center extensions and a snap-in for Azure Stack HCI solution management. For additional information, see [hpe.com/us/en/alliance/microsoft/ws-admin-center.html](https://hpe.com/us/en/alliance/microsoft/ws-admin-center.html).

### HPE Server and Azure Stack HCI Extension for Windows Admin Center

For Azure Stack HCI solutions built with HPE ProLiant DL380 Gen10 servers on Windows Server 2019 or Azure Stack HCI OS, HPE has created two Windows Admin Center extensions to enable HPE specific management features. The HPE Server Extension provides a “single pane of glass” view of server components, health status, remedy options, and BIOS setting details. It also provides links to server HPE iLO for additional in-depth server management. The HPE extensions for Microsoft Azure Stack HCI highlights cluster health and configuration details. It also surfaces firmware and driver revisions across cluster nodes to help prevent node inconsistency, a leading factor of issues with hyperconverged clusters.

### HPE Deployment and Update snap-in for Microsoft Azure Stack HCI

For Azure Stack HCI solutions built with HPE ProLiant DL380 Gen10 servers on Azure Stack HCI OS, HPE provides a snap-in for Windows Admin Center to support firmware/software deployment and update. The latest Service Pack for ProLiant (SPP) can be deployed during the WAC Cluster Creation process before a cluster is created, or during WAC Cluster Updates after a cluster is already up and running.



## HPE ProLiant DL380 Gen10 Azure Stack HCI solution guidelines

- All the Azure Stack HCI solution examples documented in this technical white paper can be configured using a LFF or SFF Chassis.
- Any core count processors can be used in building an Azure Stack HCI solution.
- The minimum processor frequency that can be used is identified in each of the Azure Stack HCI solution examples.
- Use of alternative Windows OS boot devices and capacities other than what is specified in the example Azure Stack HCI solution configurations in this document is supported.
  - Microsoft Software Defined Datacenter Additional Qualifier (SDDC AQ) is not required for boot drives
  - The HPE ProLiant DL380 built in Smart Array S100i SR Gen10 SW RAID controller can be used for Windows OS boot using SATA devices
  - For additional information, see [Microsoft Storage Spaces Direct Base requirements for Windows Boot](#)
- Always install and update HPE Azure Stack HCI solution drivers and firmware using [Service Pack for ProLiant \(SPP\) Version 2021.10.1](#).
  - All Azure Stack HCI solution validations performed by HPE always use the most recent Service Pack for ProLiant (SPP) version
  - Alternative component firmware should only be used to resolve critical issues as indicated by HPE Support Communication Customer Bulletin
- For more information on Microsoft's platform hardware requirements for an Azure Stack HCI solution, refer to [Microsoft's Storage Spaces Direct hardware requirements](#).
- All drives available for HPE ProLiant will always have Windows Server Certification and the required Software Defined Datacenter Additional Qualifier. Hence any drives in the HPE catalog for the platform can be used with these HPE Azure Stack Solutions.
  - See [HPE ProLiant DL380 Gen10 QuickSpecs](#) for a complete list of available drive options
  - Each Azure Stack HCI solution in this document can only be configured using the solution identified bus types for cache and capacity devices
  - When choosing drives for HPE Azure Stack HCI solutions, make sure you follow the [Microsoft Recommended Drive Hardware Requirements](#)
- Azure Stack HCI solutions can be implemented using Windows Server 2019 or Azure Stack HCI OS. For information on configuration and deployment of HPE Azure Stack HCI solutions on HPE ProLiant using Microsoft Windows Server 2019, see [Implementing Windows Server 2019 Azure Stack HCI using HPE ProLiant servers](#). For information on configuration and deployment of HPE Azure Stack HCI solutions on HPE ProLiant using Microsoft Azure Stack HCI OS, refer to [Implementing Azure Stack HCI OS using HPE ProLiant Servers](#).



## All-Flash SAS SSD capacity example configuration

**Solution Configuration/node**  
**Version 1.7**

**HPE ProLiant DL380 Gen10 All-Flash SAS SSD**  
**SAS SSD capacity**  
**Processor 1.7 GHz or faster**  
**Memory from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 core) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 24SFF Configure-To-Order Server	868704-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-B21	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-B21	1 or more
<b>OS boot (rear cage)</b>	HPE 2TB 6G SATA 7.2K rpm SFF HDD	765455-B21	2
<b>2 SFF kit</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U SFF Easy Install Rail Kit	733660-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Cabling instructions can be found [here](#).

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Capacity SSD</b>	HPE 800GB SAS 12G MU SFF SC DS SSD	See guidelines below	4 or more

### Configuration guidelines

- Use of alternative size capacity SAS SSD drives within this solution is permitted
  - The capacity must be configured with 4 or more SAS SSD drives with a size greater than or equal to 800 GB
  - See [HPE ProLiant DL380 Gen10 QuickSpecs](#) for a complete list of available SAS SSD drive options



## All-Flash NVMe capacity example configuration

**Solution Configuration/node**  
**Version 1.5**

**HPE ProLiant DL380 Gen10 All-Flash NVMe**  
**NVMe capacity**  
**Processor 1.7 GHz or faster**  
**Memory from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 core) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 8SFF Configure-to-order Server	868703-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-B21	1 or more
<b>OS boot</b>	HPE 2TB 6G SATA 7.2K rpm SFF HDD	765455-B21	2
<b>NVMe riser kit</b>	HPE DL38x Gen10 4-port 8 NVMe Slim SAS Riser	867807-B21	1
<b>NVMe riser kit</b>	HPE DL38x Gen10 2-port Slim SAS Riser	867808-B21	1
<b>NVMe riser kit</b>	HPE DL38x Gen10 4P Slim SAS 2nd Riser	873732-B21	1
<b>NVMe bay</b>	HPE DL38x NVMe 8 SSD Express Bay	826689-B21	2
<b>NVMe bay</b>	HPE DL38x Gen10 Premium 6 SFF SAS/SATA + 2 NVMe bay	826690-B21	1
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U SFF Easy Install Rail Kit	733660-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Cabling instructions can be found [here](#).

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Capacity NVMe</b>	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	See guidelines below	4 or more

### Configuration guidelines

- Use of alternative size Capacity NVMe devices within this Solution is permitted
  - The Capacity must be configured with 4 or more NVMe devices with a size greater than or equal to 1.6 TB
  - See [HPE ProLiant DL380 Gen10 QuickSpecs](#) for a complete list of available NVMe device options
- When using a PCIe plug-in network adapter, the maximum NVMe device quantity is limited to 16
- To support more than 8 NVMe devices requires the installation of 2 processors



## All-Flash SATA SSD capacity example configuration

**Solution Configuration/node**  
**Version 1.3**

**HPE ProLiant DL380 Gen10 All-Flash SATA SSD**  
**SATA SSD capacity**  
**Processor 1.7 GHz or faster**  
**Memory from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 core) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 24SFF Configure-to-order Server	868704-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>OS boot (rear cage)</b>	HPE 2TB 6G SATA 7.2K rpm SFF HDD	765455-B21	2
<b>2 SFF kit</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U SFF Easy Install Rail Kit	733660-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Capacity HDD</b>	HPE 960GB SATA MU SSD	See guidelines below	4 or more

Cabling instructions can be found [here](#).

### Configuration guidelines

- Use of alternative size capacity SATA SSD drives within this solution is permitted
  - The Capacity must be configured with 4 or more SATA SSD drives with a size greater than or equal to 960 GB
  - See [HPE ProLiant DL380 Gen10 QuickSpecs](#) for a complete list of available SATA SSD drive options



## Hybrid SAS SSD Cache/SAS HDD capacity example configuration

**Solution BOM/node**  
**Version 1.6**

**HPE ProLiant DL380 Gen10 Hybrid SAS SSD/SAS HDD**  
**SAS SSD cache/SAS HDD capacity**  
**Processor configurations 1.7 GHz or faster**  
**Memory configurations from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 core) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 12LFF Configure-to-order Server	868705-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Drive cage PS</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>Drive cage PCI</b>	HPE DL38x Gen10 Prem 2SFF HDD Riser Kit	826688-B21	2
<b>Mirrored M.2 boot</b>	HPE Universal SATA HH M.2 Kit	878783-B21	1
<b>Mirrored M.2 boot</b>	HPE 480GB SATA RI M.2 2280 DS SSD	875319-B21	2
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U LFF Easy Install Rail Kit	733662-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Cache SSD</b>	HPE 400GB SAS 12G MU SFF DS SSD	See guidelines below	2 or more
<b>Capacity HDD</b>	HPE 600GB SAS 10K SFF SC DS HDD	See guidelines below	4 or more

Cabling instructions can be found [here](#).

### Configuration guidelines

- Use of alternative size SAS Cache SSDs and SAS Capacity HDDs is supported.
  - The Cache must be configured with 2 or more SAS SSDs with a size greater than or equal to 400 GB per drive
  - The Capacity must be configured with 4 or more SAS HDDs with a size greater than or equal to 600 GB per drive
  - See [HPE ProLiant DL380 Gen10 QuickSpecs](#) for a complete list of available SAS SSD and HDD drive options



## Hybrid SATA SSD Cache/SAS HDD capacity example configuration

**Solution BOM/node** HPE ProLiant DL380 Gen10 Hybrid SATA SSD/SAS HDD  
**Version 1.5** SATA SSD cache/SAS HDD capacity  
**Processor configurations 1.7 GHz or faster**  
**Memory configurations from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 12LFF Configure-to-order Server	868705-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Drive cage PS</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>Drive cage PCI</b>	HPE DL38x Gen10 Prem 2SFF HDD Riser Kit	826688-B21	2
<b>Mirrored M.2 boot</b>	HPE Universal SATA HH M.2 Kit	878783-B21	1
<b>Mirrored M.2 boot</b>	HPE 480GB SATA RI M.2 2280 DS SSD	875319-B21	2
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U LFF Easy Install Rail Kit	733662-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Capacity SSD</b>	HPE 960GB SATA MU SFF SC DS SSD	See guidelines below	Varies
<b>Capacity HDD</b>	HPE 1TB SAS 7.2K SFF SC DS HDD	See guidelines below	4 or more

Cabling instructions can be found [here](#).

### Configuration guidelines

- Use of alternative size NVMe Cache and SAS SSD or HDD Capacity drives within this solution is permitted
  - The Cache must be configured with 2 or more SATA SSDs with a size greater than or equal to 960 GB per drive.
  - The Capacity must be configured with 4 or more SAS HDDs with a size greater than or equal to 1 TB per drive.





## Hybrid NVMe Cache/SAS HDD capacity example configuration

## Hybrid NVMe Cache/SAS SSD capacity example configuration

## Hybrid NVMe Cache/SAS SSD + SAS HDD capacity example configuration

Solution BOM/node  
Version 1.0

HPE ProLiant DL380 Gen10 Hybrid NVMe/(SAS SSD and/or SAS HDD)  
NVMe cache/SAS HDD capacity or  
NVMe cache/SAS SSD capacity or  
NVMe cache/SAS SSD + SAS HDD capacity  
Processor configurations 1.7 GHz or faster  
Memory configurations from 64 GB to 3 TB  
Minimum of 2 nodes with a cluster witness  
Maximum of 16 nodes

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 8SFF Configure-to-order Server	868703-B21	1
<b>Processors</b>	See the <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xxx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>OS boot (rear cage)</b>	HPE 2TB 6G SATA 7.2K rpm SFF HDD	765455-B21	2
<b>2 SFF kit</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>NVMe riser kit</b>	HPE DL38x Gen10 4-port 8 NVMe Slim SAS Riser	867807-B21	1
<b>NVMe bay</b>	HPE DL38x NVMe 8 SSD Express Bay	826689-B21	1
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U SFF Easy Install Rail Kit	733660-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Cache NVMe</b>	HPE 1.6TB NVMe x4 MU SFF SCN DS SSD	<a href="#">See guidelines</a>	2 or more
<b>Capacity SSD</b>	HPE 400GB 12G SAS MU SFF SC DS SSD	<a href="#">See guidelines</a>	Varies
<b>Capacity HDD</b>	HPE 600GB SAS 12G 10K SFF SC DS HDD	<a href="#">See guidelines</a>	4 or more

Cabling instructions can be found [here](#).



**Configuration guidelines**

- Use of alternative size NVMe Cache and SAS SSD or HDD Capacity drives within this solution is permitted
- For a Solution with NVMe Cache containing both SSD and HDD Capacity Drives
  - The cache must be configured with 2 or more NVMe devices with a size greater than or equal to 1.6 TB
  - The capacity must be configured with 2 or more SAS SSD drives with a size greater than or equal to 400 GB
  - The capacity must be configured with 4 or more SAS HDD drives with a size greater than or equal to 600 GB
- For a Solution with NVMe Cache with SSD Capacity Drives
  - The cache must be configured with 2 or more NVMe devices with a size greater than or equal to 1.6 TB
  - The capacity must be configured with 4 or more SAS SSD drives with a size greater than or equal to 400 GB
- For a Solution with NVMe Cache with HDD Capacity Drives
  - The cache must be configured with 2 or more NVMe devices with a size greater than or equal to 1.6 TB
  - The capacity must be configured with 4 or more SAS HDD drives with a size greater than or equal to 600 GB



## Hybrid Persistent Memory Cache/SAS SSD capacity example configuration

**Solution BOM/node** HPE ProLiant DL380 Gen10 Hybrid Persistent Memory SAS SSD  
**Version 1.0** Persistent Memory Cache/SAS SSD Capacity  
**2nd Generation Intel® Xeon® Scalable processor configurations 1.8 GHz or faster**  
**Memory configurations from 64 GB to 3 TB**  
**Minimum of 2 nodes with a cluster witness**  
**Maximum of 16 nodes**

Item	Description	Part number	Quantity
<b>Operating system</b>	Azure Stack HCI OS or Windows Server 2019 Datacenter (16 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	1
<b>Additional processor core licenses depend upon processor option</b>	Windows Server 2019 Datacenter Additional License (2 cores) HPE recommends HPE OEM licenses for Windows Server 2019	See <a href="#">Appendix</a> for HPE OEM license options	Varies
<b>Server</b>	HPE DL380 Gen10 24SFF Configure-To-Order Server	868704-B21	1
<b>Processors</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Processor Options	xxxxxx-L21 xxxxxx-B21	1 or 2
<b>Memory</b>	See <a href="#">HPE ProLiant DL380 Gen10 QuickSpecs</a> for Memory Options	xxxxxx-xx	Varies
<b>Network adapters</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>Storage controllers</b>	See <a href="#">Supported network adapter and storage controller options</a>	xxxxxx-xxx	1 or more
<b>OS boot (rear cage)</b>	HPE 2TB 6G SATA 7.2K rpm SFF HDD	765455-B21	2
<b>2 SFF kit</b>	HPE DL38x Gen10 Premium 2SFF HDD Kit	826687-B21	1
<b>Power supply</b>	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	865414-B21	2
<b>TPM</b>	HPE TPM 2.0 Gen10 Kit	864279-B21	1
<b>Rail kit</b>	HPE 2U SFF Easy Install Rail Kit	733660-B21	1
<b>HPE OneView</b>	HPE OV w/o iLO 3yr 24x7 FIO Phys 1 LTU	P8B31A	1
<b>HPE iLO Advanced</b>	HPE iLO Adv Security Lic 3yr Support	BD505A	1

Option type	Description	Part number	Quantity
<b>Minimum drive size validated, equal or larger drive sizes may be used</b>			
<b>Cache Persistent Memory</b>	HPE 128GB 2666 Persistent Memory Kit featuring Intel® Optane™ DC Persistent Memory	See guidelines below	2 or more
<b>Capacity SSD</b>	HPE 800GB SAS 12G MU SFF SC DS SSD	See guidelines below	4 or more

Cabling instructions can be found [here](#).

### Configuration guidelines

- Use of alternative size Cache Persistent Memory modules and Capacity SAS SSD drives within this solution is permitted.
  - The cache must be configured with 2 or more Persistent Memory modules with a size greater than or equal to 128 GB
  - The capacity must be configured with 4 or more SAS SSD drives with a size greater than or equal to 800 GB



## Supported network adapter and storage controller options

- Adapters supporting both iWARP and RoCE must be configured in iWARP mode
- HPE Azure Stack HCI solution only supports the use of SAS Drives in HPE external disk enclosures
- You will achieve better Storage Spaces Direct I/O performance with drives directly connected to storage controllers versus connecting drives to the storage SAS expander
- The HPE P816i-a controller has 16 PCIe lanes allowing connection of up to 16 SAS or SATA drives. It is your perfect choice for achieving maximum Storage Spaces Direct I/O performance without the use of an SAS expander
- OS boot drives must not reside on any Smart Array Controller containing Storage Spaces Direct drives
- Storage Spaces Direct drives cannot reside on any Smart Array Controller configured with RAID volumes

Option type	Description	Part number
<b>Network FlexibleLOM</b>	HPE Ethernet 10/25Gb 2-port 640FLR-SFP28 Adapter	817749-B21
<b>Network FlexibleLOM</b>	HPE Ethernet 10/25Gb 2-port 622FLR-SFP28 Converged Network Adapter	867334-B21
<b>Network adapter PCIe plug-in</b>	HPE Ethernet 10Gb 2-port 521T Adapter	867707-B21
<b>Network adapter PCIe plug-in</b>	HPE Ethernet 10/25Gb 2-port 640SFP28 Adapter	817753-B21
<b>Network adapter PCIe plug-in</b>	HPE Ethernet 10/25Gb 2-port 621SFP28 Adapter	867328-B21
<b>Network adapter PCIe plug-in</b>	HPE InfiniBand EDR/Ethernet 100Gb 1-port 840QSFP28 Adapter	825110-B21
<b>Network adapter PCIe plug-in</b>	HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter	825111-B21
<b>Storage controller modular</b>	HPE Smart Array P816i-a SR Gen10 (16 Internal Lanes/4GB Cache/SmartCache) 12G SAS Modular Controller	804338-B21
<b>Storage controller modular</b>	HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular Controller	804326-B21
<b>Storage controller modular</b>	HPE Smart Array P408i-a SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS Modular Controller	804331-B21
<b>Storage controller PCIe plug-in</b>	HPE Smart Array E208i-p SR Gen10 (8 Internal Lanes/No Cache) 12G SAS PCIe Plug-in Controller	804394-B21
<b>Storage controller PCIe plug-in</b>	HPE Smart Array P408i-p SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS PCIe Plug-in Controller	830824-B21
<b>Storage controller PCIe plug-in (Only SAS Drives are supported)</b>	HPE Smart Array E208e-p SR Gen10 (8 External Lanes/No Cache) 12G SAS PCIe Plug-in Controller	804398-B21
<b>Storage controller PCIe plug-in (Only SAS Drives are supported)</b>	HPE Smart Array P408e-p SR Gen10 (8 External Lanes/4GB Cache) 12G SAS PCIe Plug-in Controller	804405-B21
<b>Storage SAS expander</b>	HPE DL38x Gen10 12Gb SAS Expander	870549-B21



## Services and support

### HPE Pointnext Services—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. [Advisory Services](#) from HPE Pointnext Services, focus on your business outcomes and goals, partnering with you to design your transformation and build a road map aligned to your unique requirements. Our [Professional](#) and [Operational Services](#) can be leveraged to speed up time-to-production, boost performance, and accelerate your business. HPE Pointnext Services 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. HPE Pointnext 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 1-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.

[hpe.com/services/techcare](https://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
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

[hpe.com/services/complecare](https://hpe.com/services/complecare)



## HPE as Microsoft's Cloud Solution Provider

Microsoft's Cloud Solution Provider (CSP) Program allows the customer to move away from transactional purchases of software and infrastructure and embrace cloud-driven business enablement with pay-as-you-go solutions.

- CSP means no up-front commitment and there are no constraints of perpetual licenses. It provides enterprises with improved flexibility as they pay a predictable monthly bill based on their usage of Microsoft cloud services.
- Enterprises can contract solely with HPE as their CSP for the Azure subscription and services. The price and payment relationship with the CSP simplifies the billing as it avoids the hassle of keeping track of multiple billing cycles for different subscriptions with Microsoft.
- Customers can save cost and increase the efficiency of their IT spend by switching from transactional and perpetual purchases of software and infrastructure and embracing cloud-driven business enablement with pay-as-you-go pay per minute solutions.
- It is a CSP program requirement that CSP partners must include support when reselling the subscription. Customers will contact their CSP for level 1 and level 2 support and the CSP is required to help resolve the problem for the customer. The CSP can elevate calls to Microsoft if needed but the CSP remains responsible for all customer communications.

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

HPE can also provide remote support for Microsoft Cloud Services (Azure and Office 365) via Microsoft's proven access model for partners such as Microsoft Azure Lighthouse and Granular Delegated Admin Privileges (GDAP) to existing cloud customers when HPE is not the customer's CSP.

For additional information on the Microsoft Managed Services features for remote access, visit:

[docs.microsoft.com/en-us/azure/lighthouse/](https://docs.microsoft.com/en-us/azure/lighthouse/)

[docs.microsoft.com/en-us/partner-center/gdap-introduction](https://docs.microsoft.com/en-us/partner-center/gdap-introduction)



## Appendix

Hewlett Packard Enterprise recommends cost-efficient HPE OEM licenses for Microsoft Windows Server 2019 Datacenter for a complete Azure Stack HCI solution from hardware to operating system out of one hand. Alternatively, customer supplied Windows Server 2019 Datacenter licenses such as Volume License or Retail can also be used.

The HPE OEM calculator for Microsoft Windows Server Core Licensing Calculator tool can assist you in calculating the number of required licenses: [hpe.com/servers/windows-license-calculator](https://hpe.com/servers/windows-license-calculator).

### HPE offers OEM Windows Server licenses in two distinct options and a wide range of languages:

- **Reseller Option Kit (ROK)**—Available through authorized HPE resellers at the time of purchase of an [HPE server system](#).
- **Direct from HPE factory**—Available for sale along with the purchase of your HPE server from the factory, you can select OEM Windows Server 2019 Datacenter as a **not preinstalled** (Npi) option (also referred to as **drop in the box** license).

In both the options, the OS media is included with the server.

For an updated list of available part numbers, see the [HPE OEM Windows Server 2019 OEM QuickSpecs](#).

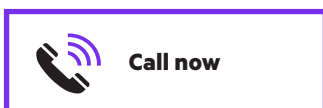
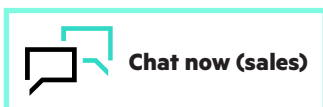
### Reference

[Microsoft Windows Server 2019 OEM licenses from HPE](#)

## Learn more at

[hpe.com/solutions/azurestackhci](https://hpe.com/solutions/azurestackhci)

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