

HPE Solutions for Azure Local

HPE

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Introduction

This technical white paper provides solution guidelines and example configurations for Azure Local Hyperconverged Infrastructure (HCI) on HPE ProLiant, HPE Alletra (HPE Apollo), and HPE Edgeline servers deployed as clustered solutions using Azure Local. Hewlett Packard Enterprise has validated the following platform and configuration combinations that optimize software-defined storage based on Storage Spaces Direct, software-defined compute, and software-defined networking for reliability, efficiency, and performance.

Azure Local solution management

HPE offers unique Microsoft Windows Admin Center (WAC) extensions for Azure Local solution management. For additional information, visit [HPE Extensions for Microsoft Windows Admin Center](#).

HPE Extensions for Microsoft Windows Admin Center

HPE has created two WAC 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 HPE iLO for in-depth server management. The HPE extension for Azure Local highlights instance health and configuration details. It also surfaces firmware and driver revisions across instance nodes to help prevent node inconsistency, a leading factor of issues with hyperconverged clusters.

To download and deploy the HPE Server and Azure Local Extension, see [Installing HPE Server and Azure Stack HCI WAC Extensions](#) at HPE Support Center.

HPE snap-in for deployment and update of Azure Local Validated Nodes

HPE provides a snap-in for WAC to support firmware/software deployment and update on Validated Nodes. The latest Service pack for HPE ProLiant (SPP) can be installed after Azure Local instance deployment. Check the [Azure Local Known issues](#) to determine if any alternative component firmware or driver should be used to resolve critical issues.

The HPE WAC Update snap-in should be used on HPE Validated Nodes for firmware/software updates, while HPE Premier Solutions and Integrated Systems must use the Standard SBE for this operation. Details on the HPE Standard SBE can be found in the Solution Builder Extension section of this document.

Premier Solutions for Azure Local

The HPE ProLiant DL380 Gen11 Server Premier Solution for Azure Local is designed for enterprise, edge, and retail use and offers a carefully curated choice of options and continuous update testing for demanding virtualized, hybrid workloads requiring high levels of reliability with hardware, services, and support with seamless integration into Microsoft Azure's public cloud services.

Integrated Systems for Azure Local

The HPE ProLiant DL145 Gen11 Integrated System for Azure Local is available in All Flash NVMe configurations with optional GPUs optimized for office, edge, and far-edge scenarios. It provides tight integration between on-premises solution and public cloud service and optional Azure Local-specific cloud services that can run on-premises.

HPE Server platforms supported as Validated Nodes for Azure Local

- HPE ProLiant DL380 Gen11
- HPE ProLiant DL380 Gen10 Plus
- HPE ProLiant DL380 Gen10
- HPE ProLiant DL385 Gen11
- HPE ProLiant DL385 Gen10 Plus v2
- HPE ProLiant DL385 Gen10 Plus
- HPE ProLiant DL385 Gen10

- HPE ProLiant DL365 Gen11
- HPE ProLiant DL360 Gen11
- HPE ProLiant DL360 Gen10 Plus
- HPE ProLiant DL360 Gen10
- HPE ProLiant DL345 Gen11
- HPE ProLiant DL325 Gen11
- HPE ProLiant DL325 Gen10 Plus v2
- HPE ProLiant DL325 Gen10 Plus
- HPE ProLiant DL325 Gen10
- HPE ProLiant DL145 Gen11
- HPE ProLiant DL110 Gen10 Plus
- HPE Alletra Storage Server 4110
- HPE Apollo 4200 Gen10 Plus
- HPE Apollo 4200 Gen10
- HPE Edgeline EL8000
- HPE Edgeline EL8000 with HPE Edgeline e920 Server Blade
- HPE Edgeline EL8000 with HPE Edgeline e920d Server Blade
- HPE Edgeline EL8000 with HPE Edgeline e910 Server Blade
- HPE Edgeline EL8000t
- HPE Edgeline EL8000t with HPE Edgeline e920t Server Blade
- HPE Edgeline EL8000t with HPE Edgeline e910t Server Blade

HPE solution configuration guidelines for Azure Local

- The Azure Local solution examples documented in this paper can be configured using an SFF or LFF chassis, where relevant.
- All nodes in the instance must be configured identically, and use the same firmware, drivers, ROM, and BIOS settings.
- Any core count processor can be used in building an Azure Local solution.
- Use of alternative Windows OS boot devices and capacities other than what is specified in the Azure Local solution configurations in this document is supported.
 - Microsoft Software Defined Datacenter Additional Qualifier (SDDC AQ) is not required for boot drives.
- Install and update Azure Local Validated Node solution firmware and drivers using the latest [Service pack for HPE ProLiant \(SPP\)](#).
 - Alternative component firmware and drivers should only be used to resolve critical issues as indicated in the [Azure Local Known issues](#).
- For more information on Microsoft’s platform hardware requirements for an Azure Local solution, see the [Storage Spaces Direct hardware requirements](#).
- All drives available for HPE ProLiant have Windows Server certification, so any drives in the HPE catalog for the platform can be used with these Azure Local solutions.
 - See [HPE QuickSpecs](#) for one of the supported server platforms of your choice and for a complete list of available drive options.
 - Each Azure Local solution in this document can only be configured using the solution-identified bus types for cache and capacity devices.
 - When choosing drives for Azure Local solutions, make sure you follow the [drive hardware requirements](#).

Table 1. Storage architecture configurations supported on each server model platform

| Configuration | All-flash SATA capacity | All-flash SAS capacity | All-flash NVMe capacity | Hybrid SATA SSD cache SAS HDD capacity | Hybrid SAS SSD cache SAS HDD capacity | Hybrid NVMe cache SAS capacity |
|--|-------------------------|------------------------|-------------------------|--|---------------------------------------|--------------------------------|
| HPE ProLiant DL380 Gen11 Premier Solution | | • | • | | | |
| HPE ProLiant DL145 Gen11 Integrated System | | | • | | | |
| HPE ProLiant DL380 Gen11 | | • | • | | • | • |
| HPE ProLiant DL380 Gen10 Plus | | • | • | | • | • |
| HPE ProLiant DL380 Gen10 | • | • | • | • | • | • |
| HPE ProLiant DL385 Gen11 | | • | • | | | |
| HPE ProLiant DL385 Gen10 Plus v2 | | • | • | • | | • |
| HPE ProLiant DL385 Gen10 Plus | | • | | | • | • |
| HPE ProLiant DL385 Gen10 | • | • | • | | • | • |
| HPE ProLiant DL365 Gen11 | | • | • | | | |
| HPE ProLiant DL360 Gen11 | | • | • | | • | • |
| HPE ProLiant DL360 Gen10 Plus | | • | • | | • | • |
| HPE ProLiant DL360 Gen10 | | • | • | | • | • |
| HPE ProLiant DL345 Gen11 | | • | • | | | |
| HPE ProLiant DL325 Gen11 | | • | • | | | |
| HPE ProLiant DL325 Gen10 Plus v2 | | • | • | | • | • |
| HPE ProLiant DL325 Gen10 Plus | | • | | | | • |
| HPE ProLiant DL325 Gen10 | • | • | | | • | • |
| HPE ProLiant DL145 Gen11 | | | • | | | |
| HPE ProLiant DL110 Gen10 Plus | | | • | | | |
| HPE Alletra Storage Server 4110 | | | • | | | |
| HPE Apollo 4200 Gen10 Plus | • | • | | | | • |
| HPE Apollo 4200 Gen10 | | • | | | • | • |
| HPE Edgeline EL8000 with e920 Server Blade | | | • | | | |
| HPE Edgeline EL8000 with e920d Server Blade | | | • | | | |
| HPE Edgeline EL8000 with e910 Server Blade | | | • | | | |
| HPE Edgeline EL8000t with e920t Server Blade | | | • | | | |
| HPE Edgeline EL8000t with e910t Server Blade | | | • | | | |

Drive configuration guidelines

- Use of any size drive above 500GB within this solution is supported for cache-tier, capacity-tier, or single-tier storage.
- Hybrid storage tiers require two cache drives minimum, plus four capacity drives minimum.
- Single-tier storage all-flash requires at least two drives. This can be achieved with SATA SSD, SAS SSD, or NVMe devices.
- Cache-tier and single-tier all-flash configurations are recommended to use mixed-use endurance.

Table 2. Supported NVMe EDSFF drives

| Description | Part number |
|---|-------------|
| HPE 15.36TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 CD8P SSD | P69546-B21 |
| HPE 7.68TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 CD8P SSD | P69239-B21 |
| HPE 3.84TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 CD8P SSD | P69237-B21 |
| HPE 1.92TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 CD8P SSD | P69234-B21 |
| HPE 7.68TB NVMe Gen5 High Performance Read Intensive E3S EC1 Self-encrypting FIPS 140-2 CM7 SSD | P70674-B21 |
| HPE 15.36TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM CM7 SSD | P61187-B21 |
| HPE 7.68TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM CM7 SSD | P61183-B21 |
| HPE 3.84TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM CM7 SSD | P61179-B21 |
| HPE 15.36TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM PM1743 SSD | P57807-B21 |
| HPE 7.68TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM PM1743 SSD | P57803-B21 |
| HPE 3.84TB NVMe Gen5 High Performance Read Intensive E3S EC1 EDSFF SPDM PM1743 SSD | P57799-B21 |
| HPE 15.36TB NVMe Gen5 High Performance Read Intensive E3S EC1 PS1010 SSD | P70397-B21 |
| HPE 7.68TB NVMe Gen5 High Performance Read Intensive E3S EC1 PS1010 SSD | P70395-B21 |
| HPE 3.84TB NVMe Gen5 High Performance Read Intensive E3S EC1 PS1010 SSD | P70392-B21 |
| HPE 15.36TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 EDSFF SPDM PE1010 SSD | P77275-B21 |
| HPE 7.68TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 EDSFF SPDM PE1010 SSD | P77273-B21 |
| HPE 3.84TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 EDSFF SPDM PE1010 SSD | P77271-B21 |
| HPE 1.92TB NVMe Gen5 Mainstream Performance Read Intensive E3S EC1 EDSFF SPDM PE1010 SSD | P77269-B21 |
| HPE 6.4TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 CD8P SSD | P69245-B21 |
| HPE 3.2TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 CD8P SSD | P69243-B21 |
| HPE 1.6TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 CD8P SSD | P69241-B21 |
| HPE 6.4TB NVMe Gen5 High Performance Mixed Use E3S EC1 Self-encrypting FIPS 140-2 CM7 SSD | P70672-B21 |
| HPE 3.2TB NVMe Gen5 High Performance Mixed Use E3S EC1 Self-encrypting FIPS 140-2 CM7 SSD | P70669-B21 |
| HPE 6.4TB NVMe Gen5 High Performance Mixed Use E3S EC1 EDSFF SPDM CM7 SSD | P61195-B21 |

Table 2. Supported NVMe EDSFF drives (continued)

| Description | Part number |
|--|-------------|
| HPE 3.2TB NVMe Gen5 High Performance Mixed Use E3S EC1 EDSFF SPDM CM7 SSD | P61191-B21 |
| HPE 12.8TB NVMe Gen5 High Performance Mixed Use E3S EC1 PS1030 SSD | P70403-B21 |
| HPE 6.4TB NVMe Gen5 High Performance Mixed Use E3S EC1 PS1030 SSD | P70401-B21 |
| HPE 3.2TB NVMe Gen5 High Performance Mixed Use E3S EC1 PS1030 SSD | P70399-B21 |
| HPE 6.4TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 EDSFF SPDM PE1030 SSD | P77267-B21 |
| HPE 3.2TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 EDSFF SPDM PE1030 SSD | P77265-B21 |
| HPE 1.6TB NVMe Gen5 Mainstream Performance Mixed Use E3S EC1 EDSFF SPDM PE1030 SSD | P77262-B21 |

Table 3. Supported NVMe SFF drives

| Description | Part number |
|---|-------------|
| HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61035-B21 |
| HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61027-B21 |
| HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61019-B21 |
| HPE 15.36TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 CM7 SSD | P63841-B21 |
| HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 CM7 SSD | P63837-B21 |
| HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 CM7 SSD | P63833-B21 |
| HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 CM7 SSD | P63829-B21 |
| HPE 15.36TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD | P50224-B21 |
| HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD | P50222-B21 |
| HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD | P50219-B21 |
| HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PM1733a SSD | P50216-B21 |
| HPE 15.36TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PS1010 SSD | P70436-B21 |
| HPE 7.68TB NVMe Gen4 High Performance Read Intensive SFF BC U.3 PS1010 SSD | P70434-B21 |
| HPE 15.36TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static SPDM Multi Vendor SSD | P69255-B21 |
| HPE 7.68TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static V2 Multi Vendor SSD | P64848-B21 |
| HPE 3.84TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static V2 Multi Vendor SSD | P64846-B21 |
| HPE 1.92TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static V2 Multi Vendor SSD | P64844-B21 |

Table 3. Supported NVMe SFF drives (continued)

| Description | Part number |
|---|-------------|
| HPE 960GB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static V2 Multi Vendor SSD | P64842-B21 |
| HPE 3.84TB NVMe Gen4 High Performance Read Intensive SFF BC Self-encrypting FIPS U.3 CM6 SSD | P41403-B21 |
| HPE 1.92TB NVMe Gen4 High Performance Read Intensive SFF BC Self-encrypting FIPS U.3 CM6 SSD | P41402-B21 |
| HPE 7.68TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD | P47847-B21 |
| HPE 3.84TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD | P47846-B21 |
| HPE 1.92TB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD | P47845-B21 |
| HPE 960GB NVMe Gen4 Mainstream Performance Read Intensive SFF BC U.3 Static Multi Vendor SSD | P47844-B21 |
| HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61059-B21 |
| HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61051-B21 |
| HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 Self-encrypting FIPS 140-3 CM7 SSD | P61043-B21 |
| HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 CM7 SSD | P63853-B21 |
| HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 CM7 SSD | P63849-B21 |
| HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 CM7 SSD | P63845-B21 |
| HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD | P50233-B21 |
| HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD | P50230-B21 |
| HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PM1735a SSD | P50227-B21 |
| HPE 6.4TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PS1030 SSD | P70428-B21 |
| HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC U.3 PS1030 SSD | P70426-B21 |
| HPE 6.4TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static V2 Multi Vendor SSD | P65023-B21 |
| HPE 3.2TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static V2 Multi Vendor SSD | P65015-B21 |
| HPE 1.6TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static V2 Multi Vendor SSD | P65007-B21 |
| HPE 800GB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static V2 Multi Vendor SSD | P64999-B21 |
| HPE 3.2TB NVMe Gen4 High Performance Mixed Use SFF BC Self-encrypting FIPS U.3 CM6 SSD | P41405-B21 |
| HPE 1.6TB NVMe Gen4 High Performance Mixed Use SFF BC Self-encrypting FIPS U.3 CM6 SSD | P41404-B21 |
| HPE 6.4TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD | P47840-B21 |
| HPE 3.2TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD | P47839-B21 |
| HPE 1.6TB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD | P47838-B21 |
| HPE 800GB NVMe Gen4 Mainstream Performance Mixed Use SFF BC U.3 Static Multi Vendor SSD | P47837-B21 |

Note

Gen10 NVMe drives use Smart Carrier (SC) and may have different part numbers. See [HPE QuickSpecs](#) for a complete list of available drive options and capacities.

Table 4. Supported NVMe M.2 drives

| Description | Part number |
|--|-------------|
| HPE Edgeline 3.84TB NVMe Gen4 Mainstream Performance Mixed Use M.2 22110 Extended Temp PM9A3 SSD | P49025-B21 |
| HPE Edgeline 1.92TB NVMe Gen4 Mainstream Performance Mixed Use M.2 22110 Extended Temp PM9A3 SSD | P49023-B21 |
| HPE Edgeline 960GB NVMe Gen4 Mainstream Performance Mixed Use M.2 22110 Extended Temp PM9A3 SSD | P49021-B21 |
| HPE 1.92TB NVMe Gen3 Mainstream Performance Read Intensive M.2 Multi Vendor SSD | P40515-B21 |
| HPE 960GB NVMe Gen3 Mainstream Performance Read Intensive M.2 Multi Vendor SSD | P40514-B21 |

Network adapter support list

Table 5. List of supported and validated network adapters

| Option type | Description | Part number |
|------------------------------|--|-------------|
| Network adapter OCP3 | Marvell QL41232HQCU Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE | P10118-B21 |
| Network adapter OCP3 | Mellanox MCX562A-ACAI Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE | P10112-B21 |
| Network adapter OCP3 | Mellanox MCX631432AS-ADAI Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE | P42041-B21 |
| Network adapter OCP3 | Intel® E810-XXVDA4 Ethernet 10/25Gb 4-port SFP28 OCP3 Adapter for HPE | P41614-B21 |
| Network adapter OCP3 | Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE | P10106-B21 |
| Network adapter OCP3 | Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 OCP3 Adapter for HPE | P22767-B21 |
| Network adapter OCP3 | Broadcom BCM57412 Ethernet 10Gb 2-port SFP+ OCP3 Adapter for HPE | P26256-B21 |
| Network adapter OCP3 | Broadcom BCM57416 Ethernet 10Gb 2-port BASE-T OCP3 Adapter for HPE | P10097-B21 |
| Network adapter OCP3 | Broadcom BCM57414 Ethernet 10/25Gb 2-port SFP28 OCP3 Adapter for HPE | P10115-B21 |
| Network adapter OCP3 | Broadcom BCM57504 Ethernet 10/25Gb 4-port SFP28 OCP3 Adapter for HPE | P26269-B21 |
| Network adapter PCIe plug-in | Marvell QL41232HLCU Ethernet 10/25Gb 2-port SFP28 Adapter for HPE | P22702-B21 |
| Network adapter PCIe plug-in | Mellanox MCX512F-ACHT Ethernet 10/25Gb 2-port SFP28 Adapter for HPE | P13188-B21 |
| Network adapter PCIe plug-in | Mellanox MCX631102AS-ADAT Ethernet 10/25Gb 2-port SFP28 Adapter for HPE | P42044-B21 |
| Network adapter PCIe plug-in | Mellanox MCX623106AS-CDAT Ethernet 100Gb 2-port QSFP56 Adapter for HPE | P25960-B21 |
| Network adapter PCIe plug-in | Intel E810-XXVDA4 Ethernet 10/25Gb 4-port SFP28 Adapter for HPE | P08458-B21 |
| Network adapter PCIe plug-in | Intel E810-XXVDA2 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE | P08443-B21 |

Table 5. List of supported and validated network adapters (continued)

| Option type | Description | Part number |
|------------------------------|---|-------------|
| Network adapter PCIe plug-in | Intel E810-CQDA2 Ethernet 100Gb 2-port QSFP28 Adapter for HPE | P21112-B21 |
| Network adapter PCIe plug-in | Broadcom BCM57412 Ethernet 10Gb 2-port SFP+ Adapter for HPE | P26259-B21 |
| Network adapter PCIe plug-in | Broadcom BCM57416 Ethernet 10Gb 2-port BASE-T Adapter for HPE | P26253-B21 |
| Network adapter PCIe plug-in | Broadcom BCM57414 Ethernet 10/25Gb 2-port SFP28 Adapter for HPE | P26262-B21 |
| Network adapter PCIe plug-in | Broadcom BCM57504 Ethernet 10/25Gb 4-port SFP28 Adapter for HPE | P26264-B21 |

Note

Azure Local 23H2 and later implements Microsoft's Network ATC technology. Network ATC automatically configures network ports based on the network intents defined by the end user at deployment time. Any network adapter ports included in the same network intent must be from an adapter with the same product ID. Any attempt to combine ports of adapters from different manufacturers will fail. Any attempt to combine ports from different models will fail. Any attempt to combine ports from similar adapters with different form factors (e.g., OCP3 vs. PCIe) will fail. This is subject to change as Microsoft continues to evolve the platform.

Network switch support list

Management switches

- HPE Networking Comware Switch Series 5900
- HPE Aruba Networking CX 6300 Switch Series

ToR switches

- HPE Networking Comware Switch Series 5944
- HPE Networking Comware Switch Series 5945
- HPE Aruba Networking CX 8100 Switch Series
- HPE Aruba Networking CX 8325 Switch Series
- HPE Aruba Networking CX 8360 Switch Series
- HPE Aruba Networking CX 9300 Switch Series
- HPE Aruba Networking CX 10000 Switch Series

For the latest information, see the [Physical network requirements for Azure Local](#).

Switch speed support matrix

Table 6. List of switch models and their supported bandwidth speeds

| Switch model | 10GbE | 25GbE | 40GbE | 100GbE | 400GbE |
|-------------------------------|-------|-------|-------|--------|--------|
| HPE Aruba Networking CX 8100 | Yes | n/a | Yes | Yes | n/a |
| HPE Aruba Networking CX 8325 | Yes | Yes | Yes | Yes | n/a |
| HPE Aruba Networking CX 8360 | Yes | Yes | Yes | Yes | n/a |
| HPE Aruba Networking CX 9300 | Yes | Yes | n/a | Yes | Yes |
| HPE Aruba Networking CX 10000 | Yes | Yes | Yes | Yes | n/a |
| HPE Networking Comware 5944 | Yes | n/a | n/a | Yes | n/a |
| HPE Networking Comware 5945 | Yes | Yes | n/a | Yes | n/a |

Switch minimum firmware requirements for Azure Local

Table 7. List of switch minimum firmware version

| Option type | Description |
|--|---|
| HPE Networking Comware Switch Series | Comware 7 version R6710 or later |
| HPE Aruba Networking CX Switch Series | HPE Aruba Networking ArubaOS CX version 10.11.1010 or later |
| HPE Aruba Networking CX 8100 Switch Series* | HPE Aruba Networking ArubaOS CX version 10.12.0006 or later |
| HPE Aruba Networking CX 9300S Switch Series** | HPE Aruba Networking ArubaOS CX version 10.14.1000 or later |
| HPE Aruba Networking CX 8325H / 8325P Switch Series*** | HPE Aruba Networking ArubaOS CX version 10.15.1005 or later |

* This firmware version applies only to the CX 8100 Switch Series

** This firmware version applies only to the CX 9300S Switch Series

*** This firmware version applies only to the CX 8325H and 8325P Switch Series

Storage controller support list

- Azure Local solutions support the use of external disk enclosures only with SAS drives.
- OS boot drives must not reside on any controller containing Storage Spaces Direct drives.
- Storage Spaces Direct drives cannot reside on any controller configured with RAID volumes.
- Only boot drives may be connected to a RAID controller.
- HPE recommends MR controllers for Azure Local solutions.

Table 8. List of supported and validated storage controllers

| Option type | Description | Part number |
|---|--|-------------|
| Storage controller OCP | HPE MR216i-o Gen11 x16 Lanes without Cache OCP SPDM Storage Controller | P47789-B21 |
| Storage controller OCP | HPE MR416i-o Gen11 x16 Lanes 8GB Cache OCP SPDM Storage Controller | P47781-B21 |
| Storage controller PCIe plug-in | HPE MR216i-p Gen11 x16 Lanes without Cache PCI SPDM Plug-in Storage Controller | P47785-B21 |
| Storage controller PCIe plug-in | HPE MR416i-p Gen11 x16 Lanes 8GB Cache PCI SPDM Plug-in Storage Controller | P47777-B21 |
| Storage controller modular | HPE MegaRAID MR416i-a Gen10 Plus 4GB 72b Cache Storage Controller | P26279-B21 |
| Storage controller modular | HPE MegaRAID MR216i-a Gen10 Plus 4GB 72b Cache Storage Controller | P26325-B21 |
| Storage controller PCIe plug-in | HPE MegaRAID MR416i-p Gen10 Plus 4GB 72b Cache Storage Controller | P06367-B21 |
| Storage controller PCIe plug-in | HPE MegaRAID MR216i-p Gen10 Plus 4GB 72b Cache Storage Controller | P26324-B21 |
| Storage controller modular | HPE Smart Array P816i-a SR Gen10 (16 Internal Lanes/4GB Cache/SmartCache) 12G SAS Modular Controller | 804338-B21 |
| Storage controller modular | HPE Smart Array E208i-a SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular Controller | 804326-B21 |
| Storage controller modular | HPE Smart Array P408i-a SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS Modular Controller | 804331-B21 |
| Storage controller PCIe plug-in | HPE Smart Array E208i-p SR Gen10 (8 Internal Lanes/No Cache) 12G SAS PCIe Plug-in Controller | 804394-B21 |
| Storage controller PCIe plug-in | HPE Smart Array P408i-p SR Gen10 (8 Internal Lanes/2GB Cache) 12G SAS PCIe Plug-in Controller | 830824-B21 |
| Storage controller PCIe plug-in (only SAS drives are supported) | HPE Smart Array E208e-p SR Gen10 (8 External Lanes/No Cache) 12G SAS PCIe Plug-in Controller | 804398-B21 |
| Storage controller PCIe plug-in (only SAS drives are supported) | HPE Smart Array P408e-p SR Gen10 (8 External Lanes/4GB Cache) 12G SAS PCIe Plug-in Controller | 804405-B21 |

GPU support guidelines

- NVIDIA® A2—Inference and AI
- NVIDIA A16—High-density VDI
- NVIDIA A40—High performance visualization, rendering, modeling, simulation, CAD
- NVIDIA L4—Efficient video, AI, and graphics
- NVIDIA L40—High performance visual computing
- NVIDIA L40S—High performance AI and graphics

GPU configuration may include some limitations (for example, GPU quantity, ambient air inlet temperature, or other limitations), depending on the configuration of other server options such as storage configuration, CPU type and wattage, or power supply type. Best practice guidance is subject to change.

Azure Local deployment

Enabling Secured-core

This section provides brief guidance for steps to enable Secured-core in BIOS. You may also need to install additional software from the Service pack for HPE ProLiant to enable the Secured-core features, such as the DRTM driver for the AMD platform.

Configuring UEFI/BIOS settings for Secured-core enablement:

- On applicable servers, a **Microsoft(R) Secured-core Support** option is available in the BIOS to easily configure all the necessary BIOS settings, as shown in Figure 1.
- Navigate to System Utilities (F9 During POST) > System Configuration > BIOS/Platform Configuration (RBSU) > Server Security to enable Secured-core support.



Figure 1. Security settings in RBSU

- On the same menu, go to > Trusted Platform Module Options > TPM 2.0 Operation > Clear to clear the TPM
- On every instance node, add the following two registry entries in the OS:

```
reg add
"HKLM\SYSTEM\CurrentControlSet\Control\DeviceGuard\Scenarios\HypervisorEnforcedCodeIntegrity" /v "Enabled" /t REG_DWORD /d 1 /f
reg add "HKLM\SYSTEM\CurrentControlSet\Control\DeviceGuard\Scenarios\SystemGuard" /v
"Enabled" /t REG_DWORD /d 1 /f
```

Note

It is advised that Secured-core be configured in the BIOS before OS installation and that registry entries be entered before adding roles and features such as Hyper-V. Enabling Secured-core post-instance deployment can result in communication issues between the Azure Local instance and the Azure cloud. If not resolved, these issues may impact the creation of new virtual machines or starting existing ones.

Premier Solutions and Integrated Systems deployment

Premier Solutions and Integrated Systems server nodes come with an Azure Local 24H2 pre-installed OS image ready for deployment. It is not recommended to reimage the nodes and/or use the SPP to flash firmware and install drivers. This may result in an unsupported firmware/software recipe different from the [Firmware and Software Compatibility Guide](#).

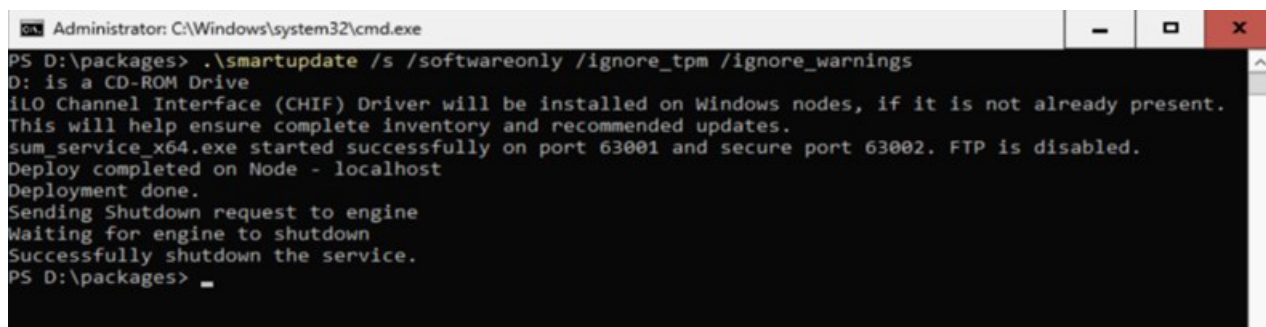
Drivers, firmware, and BIOS updates

Installing the Service pack for HPE ProLiant (SPP) on Azure Local Validated Nodes

Azure Local does not contain a full UI or browser, so it is necessary to update HPE drivers and software using the Smart Update Manager (SUM) from the command line. Azure Local provides a PowerShell command prompt for the user logged in. SUM can be run from this command prompt using the smartupdate.bat file located in the Packages folder.

To apply Smart Updates to Azure Local (without UI interaction) using CMD or Windows PowerShell:

- Download and mount the Service pack for HPE ProLiant ISO on the local system.
- Run smartupdate with the parameters as shown in Figure 2:



```
Administrator: C:\Windows\system32\cmd.exe
PS D:\packages> .\smartupdate /s /softwareonly /ignore_tpm /ignore_warnings
D: is a CD-ROM Drive
iIO Channel Interface (CHIF) Driver will be installed on Windows nodes, if it is not already present.
This will help ensure complete inventory and recommended updates.
sum_service_x64.exe started successfully on port 63001 and secure port 63002. FTP is disabled.
Deploy completed on Node - localhost
Deployment done.
Sending Shutdown request to engine
Waiting for engine to shutdown
Successfully shutdown the service.
PS D:\packages> _
```

Figure 2. Installing the Service pack for HPE ProLiant through the PowerShell command line

```
.\smartupdate /s /softwareonly /ignore_tpm /ignore_warnings
```

This process may take up to 30 minutes to complete. A common error message is a failed dependency, which can be due to the presence of a TPM module in the server. If this is the case, it is necessary to run the Smart Update in two commands: For detailed instructions on using this command-line option, see the [Smart Update Manager CLI Guide](#).

Important Note

SPP Smart Update silent installation is not supported in Azure Local 24H2 when using Gen11 Version 2025.05.00.00, 2025.07.00.00, or 2025.09.00.00 SPP. Some 23H2 drivers will be installed incorrectly and no errors will be displayed. As a workaround, identify 24H2 Smart Component drivers (cpOxxxxx.exe) from the SPP index of contents (Contents.html) and install them manually. Components supporting Windows Server 2025 are used for Azure Local 24H2.

Instance deployment

There are two different ways to deploy an Azure Local instance: through the Azure Portal or using an Azure Resource Manager (ARM) template. Both methods support a fully automated deployment of single-node and multi-node instances. Make sure to review the requirements and prerequisites as most deployment failures will require re-deployment from scratch. For detailed documentation, read [About Azure Local deployment](#).

Solution Builder Extension

HPE provides a Standard Solution Builder Extension (SBE) that includes a supplemental WDAC policy and firmware/software driver updates for Premier Solutions and Integrated Systems. Similarly, a Minimal SBE containing only the WDAC policy is available for Validated Nodes. An Azure Local instance without the HPE SBE will require WDAC to be switched to audit mode when installing drivers, as described in the next section.

The list of all current SBE releases and the supported Azure Local solution versions is shown in Table 9 and Table 10. Go to hpe.com/info/ASHCI-SBE to download them or to check for newer updates.

Table 9. List of Solution Builder Extension releases for **Premier Solutions and Integrated Systems**

| SBE family and version | Azure Local solution version | Notes |
|--------------------------|------------------------------|--|
| Standard SBE 4.2.2509.10 | 12.x.1001.x and 11.x.1001.x | Download Connector support |
| Standard SBE 4.2.2506.14 | 12.x.1001.x and 11.x.1001.x | |
| Standard SBE 4.1.2504.10 | 10.2503.x.x | |
| Standard SBE 4.1.2411.20 | 10.2411.x.x and 10.2408.x.x | SBE Patch for Standard SBE 4.1.2411.10 |
| Standard SBE 4.1.2411.10 | 10.2411.x.x and 10.2408.x.x | |

The Standard SBE can be installed on Premier Solutions and Integrated Systems during or after Azure Local instance deployment through the [Microsoft Azure Portal](#).

For installation during deployment,

(a) Extract the contents of the package and place the following files under directory C:\SBE on all nodes before deployment:

- SBE_Discovery_HPE.xml
- SBE_HPE_ProLiant-Standard_x.x.xxxx.xx.xml
- SBE_HPE_ProLiant-Standard_x.x.xxxx.xx.zip

The SBE package will be validated during deployment and installed to the instance as Standard SBE version “4.0.0.0”.

(b) After deployment is completed, create a folder in the Cluster Shared Volume (e.g., C:\ClusterStorage\UserStorage_1\SBE), place the three files listed above and discover the package using PowerShell as follows:

Add-SolutionUpdate -SourceFolder “C:\ClusterStorage\UserStorage_1\SBE”

Next, run the following to start the update:

Get-SolutionUpdate | Where-Object {\$_.PackageType -eq "SBE" -and \$_.State -eq "Ready"} | Start-SolutionUpdate

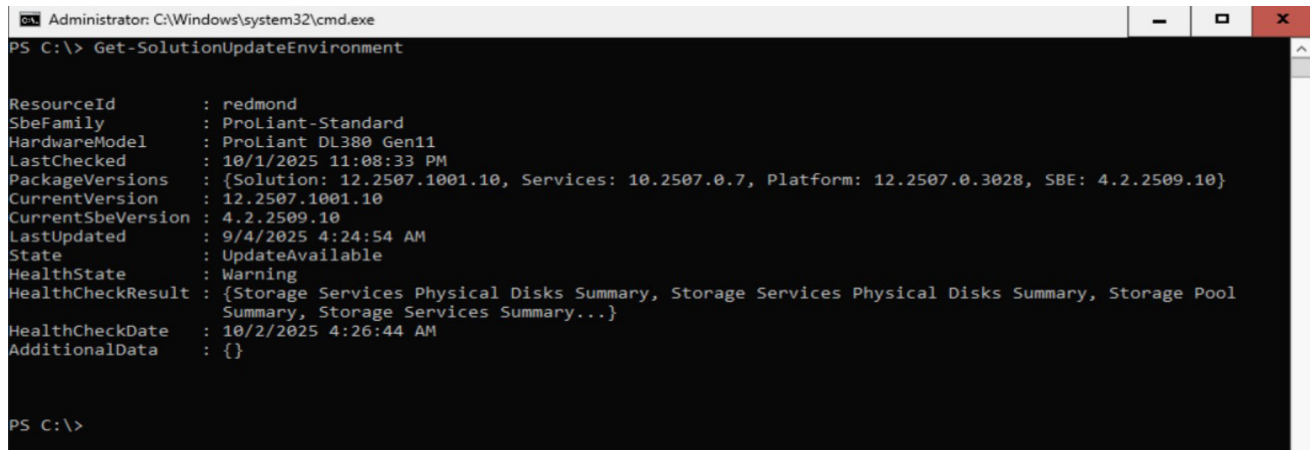
For installation after deployment, follow the instructions in step (b) only.

The Minimal SBE can be installed using the same procedure as the Standard SBE. Follow step (a) only for installation during deployment. For installation after deployment, follow step (b) instructions.

Table 10. List of Solution Builder Extension releases **for Validated Nodes**

| SBE family and version | Azure Local solution version | Notes |
|------------------------|------------------------------|---|
| Minimal SBE 4.2.2507.1 | 12.x.1001.x and 11.x.1001.x | SPP support up to version 2025.05.00.00 |
| Minimal SBE 4.1.2505.1 | 11.x.1001.x and 10.2503.x.x | SPP support up to version 2025.03.00.00 |
| Minimal SBE 4.1.2412.2 | 10.2411.x.x | SBE Patch for Minimal SBE 4.1.2412.1 |
| Minimal SBE 4.1.2412.1 | Up to 10.2408.x.x | SPP support up to version 2024.11.00.00 |
| Minimal SBE 4.1.2407.2 | 10.2311.x.x | SPP support up to version 2024.04.00.01 |
| Minimal SBE 4.1.2403.2 | 10.2311.x.x | SPP support up to version 2023.09.00.00 |

Specific installation instructions for each SBE can be found in the Release Notes. To verify the SBE has been installed successfully, use `Get-SolutionUpdateEnvironment` as in Figure 3.



```
Administrator: C:\Windows\system32\cmd.exe
PS C:\> Get-SolutionUpdateEnvironment

ResourceId      : redmond
SbeFamily       : ProLiant-Standard
HardwareModel   : ProLiant DL380 Gen11
LastChecked     : 10/1/2025 11:08:33 PM
PackageVersions : {Solution: 12.2507.1001.10, Services: 10.2507.0.7, Platform: 12.2507.0.3028, SBE: 4.2.2509.10}
CurrentVersion  : 12.2507.1001.10
CurrentSbeVersion : 4.2.2509.10
LastUpdated     : 9/4/2025 4:24:54 AM
State           : UpdateAvailable
HealthState     : Warning
HealthCheckResult : {Storage Services Physical Disks Summary, Storage Services Physical Disks Summary, Storage Pool Summary, Storage Services Summary...}
HealthCheckDate  : 10/2/2025 4:26:44 AM
AdditionalData   : {}

PS C:\>
```

Figure 3. Current SBE version installed

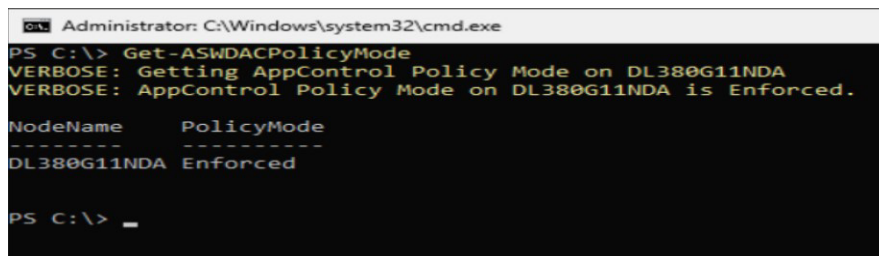
For additional help, see [Update Azure Local via PowerShell](#).

Configuring the Windows Defender Application Control

Windows Defender Application Control (WDAC) is an enhanced security feature that reduces the attack surface of Azure Local by limiting the applications and drivers that can be run and installed. WDAC is enforced by default. To install new drivers and/or run other programs, disable it by switching the policy mode to audit as follows:

Check the current WDAC policy mode as shown in Figure 4:

Get-AsWdacPolicyMode



```
Administrator: C:\Windows\system32\cmd.exe
PS C:\> Get-ASWDACPolicyMode
VERBOSE: Getting AppControl Policy Mode on DL380G11NDA
VERBOSE: AppControl Policy Mode on DL380G11NDA is Enforced.

NodeName      PolicyMode
-----
DL380G11NDA  Enforced

PS C:\> _
```

Figure 4. Checking the WDAC setting

Switching the policy mode:

```
Enable-AsWdacPolicy -Mode Audit
```

```
Enable-AsWdacPolicy -Mode Enforced
```

For more information on WDAC, see [Manage Application Control for Azure Local](#).

Installation and deployment services for Azure Local Integrated Systems

For integrated systems, 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 data center if an HPE rack is selected.

- Installation of servers and switches into a customer-provided rack if an HPE rack is not selected.
- Hardware check and visual acknowledgment that all hardware components have power.
- Cabling check to confirm all components are properly connected.

Optional services: HPE Landing Zone for Microsoft Azure Local Service

Service benefits

- Remote project management to manage all aspects of the services engagement
- Assist the customer in rapidly implementing Azure Local solution from HPE
- Validate core functionality following the solution implementation
- Provide basic solution-level knowledge transfer

Service feature highlights

- Pre-deployment readiness tracking
- Windows Admin Center deployment and/or configuration
- Azure Local node server hardware configuration
- Azure Local operating system configuration
- Azure Local instance creation
- Customer handoff

Resources for Azure Local

- [Azure Local documentation](#)
- [HPE ProLiant for Azure Local QuickSpecs](#)
- [HPE Solutions for Azure Local | HPE](#)
- [HPE Extensions for Microsoft Windows Admin Center](#)
- [HPE ProLiant DL380 Gen11 Server Premier Solution for Azure Local \(P65984-B21\)](#)
- [HPE ProLiant DL145 Gen11 Server for Azure Local Integrated System \(P78955-B21\)](#)
- [HPE ProLiant for Azure Local Integrated Systems User Guide](#)
- [HPE ProLiant for Azure Local Firmware and Software Compatibility Guide](#)
- [Microsoft Azure Stack HCI on HPE Apollo 4200 Gen10 Plus](#)
- [HPE Apollo 4200 Gen10 Plus Azure Stack HCI Solutions Consolidated Configuration Guide](#)
- [Microsoft Azure Stack HCI on HPE Alletra Storage Server 4110](#)
- [HPE Edgeline EL8000 all NVMe Azure Stack HCI solution](#)

Services and support

HPE 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 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 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 [consulting](#) and [operational support services](#) can be leveraged to speed up time to production, boost performance, and accelerate your business. HPE Services specializes in flawless and on-time implementation, on-budget implementation, and creative configurations that get the most out of software and hardware alike.

Consume IT on your terms

[HPE GreenLake cloud](#) brings the cloud experience directly to your apps and data wherever they are—edge, colocation, or 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
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- Simplify IT operations across your data centers and clouds

Managed services to run your IT operations

[HPE Managed 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 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 (AI) through thousands of deployments globally. Choose from the recommended services for customers purchasing from HPE or an authorized reseller. Services are quoted using HPE order configuration tools.

HPE Tech Care Service

[HPE Tech Care Service](#) is the new operational service experience for HPE products. HPE Tech Care Service 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 Tech Care Service 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 Tech Care Service 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 Complete Care Service

[HPE Complete Care Service](#) is a modular, edge-to-cloud IT environment service that provides a holistic approach to optimize your entire IT environment and achieve agreed-upon IT outcomes and business goals through a personalized and customer-centric experience. All are delivered by an assigned team of HPE Services experts. HPE Complete Care Service 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

* May be subject to minimums or reserve capacity may apply

HPE as Microsoft Cloud Solution Provider

Microsoft Cloud Solution Provider (CSP) program allows the customer to move away from transactional purchases of software and infrastructure and embraces 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 spending 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 CSP program, visit partner.microsoft.com/en-US/partnership/cloud-solution-provider.

HPE can also provide remote support for Microsoft Cloud Services (Azure and Office 365) through Microsoft's proven access model for partners such as Microsoft Azure Lighthouse and granular delegated admin privileges (DAP) 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:

[Azure Lighthouse documentation](#)

[Introduction to granular delegated admin privileges \(GDAP\)](#)

Learn more at

[HPE.com/solutions/AzureLocal](https://hpe.com/solutions/AzureLocal)

* May be subject to minimums or reserve capacity may apply

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