Implementing Microsoft Azure Stack Technical Preview (Proof-of-Concept)

Contents

Technical white paper

Introduction

Deliver the power of a private cloud in your data center, based on Windows Server® 2016 technologies, with a powerful and highly available storage platform built on the world's best-selling server, the Hewlett Packard Enterprise ProLiant DL380 Gen9.

HPE's Microsoft® Azure Stack solution delivers performance, reliability, and availability with reduced complexity as a single BOM, designed, engineered, rigorously tested and validated to keep your private cloud running at its best.

Hewlett Packard Enterprise is an industry leading technology company that enables customers to go further, faster. With the industry's most comprehensive portfolio, spanning the cloud to the data center to workplace applications, our technology and services help customers around the world make IT more efficient, more productive and more secure.

Microsoft Azure Stack is a new hybrid cloud platform product that enables organizations to deliver Azure services from their own data center, thereby helping them achieve more. With Azure Stack, IT can maximize agility and efficiency by transforming on-premises data center resources into Azure-consistent IaaS and PaaS services. Application developers can maximize their productivity using a "write once, deploy to Azure or Azure Stack" approach. With Microsoft Azure Stack, you can truly take advantage of cloud on your terms.

Hardware requirements

Notes

The Proof-of-Concept software is for single-node non-production environments only, and is intended for development and testing of Azure Stack-compatible services and applications. Microsoft defines system requirements for this single-node software, and HPE has defined implementations which align to those requirements.

Systems deployed using these guidelines should be used for testing and development purposes only. Configurations are subject to change. The configuration for entry-level implementation of the Azure Stack single-node software is based on the HPE ProLiant DL360 Gen9. The configuration for the high-performance implementation of the Azure Stack single-node software is based on the HPE ProLiant DL380 Gen9. The full production multi-node Azure Stack solutions are designed to be built from at least four nodes, where each of the nodes will be based on this HPE ProLiant DL380 Gen9 single-node implementation referenced below. These single-node implementations are not upgradeable to final software.

Bill of materials

HPE ProLiant DL360 Gen9—for entry-level implementation of Azure Stack in single-node configuration

Quantity	Description	Mfg. Part#
1	HPE DL360 Gen9 8SFF CTO Server	755258-B21
1	HPE DL360 Gen9 E5 2630v3 FIO Kit	755384-L21
1	HPE DL360 Gen9 E5 2630v3 Kit	755384-B21
8	HPE 16GB 2Rx4 PC4 2133P R Kit	726719-B21
4	HPE 1TB 6G SATA 7.2K 2.5in SC MDL HDD	655710-B21
1	HPE 200GB 6G SATA ME 2.5in SC EM SSD	691864-B21
1	HPE Smart Array P440ar/2G FIO Controller	749974-B21
1	HPE Ethernet 10Gb 2P 560SFP+ Adapter	665249-B21

HPE ProLiant DL380 Gen9—for high-performance implementation of Azure Stack in single-node configuration

Quantity	Description	Mfg. Part#
1	HP ProLiant DL380 Gen9 12LFF CTO Server	719061-B21
1	HP DL380 Gen9 3LFF Rear SAS/SATA Kit	768856-B21
1	HP DL380 Gen9 Intel® Xeon® E5-2660v4 (2.0GHz/14-core/35MB/105W) Processor Kit	817945-B21
1	HP DL380 Gen9 Intel Xeon E5-2660v4 (2.0GHz/14-core/35MB/105W) FIO Processor Kit	817945-L21
8	32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21
1	HP Ethernet 10Gb 2-port 546FLR-SFP+ Adapter	779799-B21
1	HP H240ar 12Gb 2-ports Int FIO Smart Host Bus Adapter	749976-B21
1	HP H240 12Gb 2-ports Int Smart Host Bus Adapter	726907-B21
3	HP DL380 Gen9 2SFF Front SAS x4 Cable Kit	783008-B21
1	HP DL380 Gen9 12LFF H240 SAS Cable Kit	786215-B21
1	HPE Dual 340GB Read Intensive-2 Solid State M.2 Enablement Kit for ProLiant ML/DL Servers	835565-B21
4	HP 1.2TB 6G SATA Write Intensive-2 LFF 3.5-in SCC 3yr Wty Solid State Drive	804680-B21
10	HP 6TB 6G SATA 7.2K rpm LFF (3.5-inch) SC Midline 512e 1yr Warranty Hard Drive	765255-B21
2	HP 800W Flex Slot Platinum Hot Plug Power Supply Kit	720479-B21
1	HP TPM Module 2.0 Kit	745823-B21
1	HP 2U Large Form Easy Install Rail Kit	733662-B21
1	HPE iLO Advanced including 1yr 24x7 Technical Support and Updates 1-server LTU	512485-B21

Installation instructions

Important note: Microsoft Azure Stack single-node (Proof-of-Concept) software is only supported in non-production environments. The purpose of the single-node software is to allow development and test access to the Azure Stack API with Azure Resource Manager, but it lacks the fault tolerance, performance, and capacity of a multi-node cluster sharing software-defined compute, storage, and networking resources. The multi-node full-solution software is only available when purchased as part of an integrated solution.

Prerequisites
1. Ensure the server is configured to boot in UEFI mode (default)

2. Ensure the server and devices are up to date with the latest BIOS and firmware components found on the HPE Support Center at h20565.www2.hpe.com/portal/site/hpsc

3. Download the "HPE Windows Server 2016 Technical Preview 5 Supplement to the SPP" which will be used later during the installation process. The software can be downloaded from downloads.hpe.com/pub/softlib2/software1/supportpack-generic/p1281324730/v116249/ms.server2016.tp5.supplement.1.00.exe

TP5 Supplement md5sum:
downloads.hpe.com/pub/softlib2/software1/supportpack-generic/p1281324730/v116249/ms.server2016.tp5.supplement.1.00.exe.md5sum

Before starting, please read the Microsoft Azure Stack Technical Preview documentation at the link below for Azure Stack installation to familiarize yourself with the process. You will need to have this document handy to deploy Azure Stack.
azure.microsoft.com/en-us/documentation/azure-stack/

Microsoft recommends using a simple HBA as the storage controller in Azure Stack. The Smart Array P440ar and Smart HBA H240/H240ar controllers in the ProLiant server can be configured in HBA pass-through mode and is the only supported configuration for the Azure Stack Technical Preview. Step-by-step instructions for configuring P440ar in HBA mode may be found below as an example, and the steps are similar for H240.

Warning: Changing the functionality of the P440ar from RAID mode to HBA mode will destroy data on all existing arrays. Therefore, be sure to first back up any critical data on the drives prior to HW mode functionality change.

Configuring the P440ar controller for HBA mode
This section describes the process for changing the functionality of the storage controller from RAID to HBA mode. If your controller is already configured in HBA mode, you can proceed to the next section, "Installing and configuring Azure Stack Technical Preview (Proof of Concept)."

Steps to enable HBA mode:

1. Power on the server

2. During POST, press F10 to enter "Intelligent Provisioning"

    a. **Important:** You will only have 15 seconds to select "Smart Storage Administrator" (next step)

3. On the next screen, select "HP Smart Storage Administrator" (SSA)

4. On the "Smart Storage Administrator" screen, select the "Smart Array P440ar" controller

5. Under "Actions," click the "Configure" button

6. Depending on your configuration, you may see one or more items under "Actions." If you see "Enable HBA Mode," select this option followed by clicking "OK" and "Finish" to complete the operation.

7. If the controller is currently configured in RAID mode and there are one or more arrays or logical drives, you should see the "Clear Configuration" button. Select this option to enable HBA Mode.

    a. **Warning:** Clicking the "Clear" button will destroy arrays, logical drives, and data on the existing drives. Be sure you've backed up any data you wish to keep prior to making this change.

    b. Click "Clear" to continue

    c. Click "Finish" to complete the operation

    d. Back on the "Actions" screen, click "Enable HBA Mode" button

    e. Click the "OK" button to confirm the operation

    f. Click "Finish" to complete the operation

8. Upon successful configuration change, click the "X" button in the upper right-hand followed by "OK" to exit the application

9. Click the blue power icon in the upper right-hand corner followed by "Reboot" to reboot the server

10. The Smart Array P440ar should now be operating in HBA mode

11. During POST press F11 to enter the "Boot Menu"

12. On the "One-Time Boot Menu," you should see a boot entry for every HDD/SSD installed and connected to the Smart Array P440ar controller similar to following screen shot:

```
Embedded RAID : Smart Array P440ar Controller - 372.61 GiB, Port:1I, Bay:1, Box:1
Embedded RAID : Smart Array P440ar Controller - 931.51 GiB, Port:1I, Bay:2, Box:1
Embedded RAID : Smart Array P440ar Controller - 931.51 GiB, Port:1I, Bay:3, Box:1
Embedded RAID : Smart Array P440ar Controller - 931.51 GiB, Port:1I, Bay:4, Box:1
Embedded RAID : Smart Array P440ar Controller - 931.51 GiB, Port:2I, Bay:5, Box:1
```

Installing and configuring Microsoft Azure Stack Technical Preview (Proof-of-Concept)

After the storage controller(s) have been configured for HBA mode, we can proceed with deploying Azure Stack. Please refer to the Microsoft Azure Stack Technical Preview documentation for prerequisites and instructions for deploying Azure Stack.

1. Install Windows Server 2016 Datacenter with Desktop Experience and be sure the target disk is the smallest SSD boot device.

2. Install the following drivers from the "HPE Windows Server 2016 Technical Preview 5 Supplement to the SPP." No need to reboot until after the final component has been installed:

HPE ProLiant Gen9 Chipset Identifier for Windows®	cp028130.exe
HPE ProLiant iLO 3/4 Channel Interface Driver for Windows x64	cp028339.exe
HPE ProLiant iLO 3/4 Management Controller Driver package	cp028266.exe
HPE ProLiant Smart Array HPCISSS3 Controller Driver for Windows Server 2012 x64 Edition	cp028330.exe
Dynamic Smart Array B140i Controller Driver for Windows 2012/2012 R2 and Windows 10 x64	cp028450.exe

3. Reboot the server

All server configuration steps have been completed. It is now time to deploy Azure Stack. Please refer to the Microsoft Azure Stack Technical Preview documentation at the link below for Azure Stack installation.
azure.microsoft.com/en-us/documentation/azure-stack/

Microsoft resources

- **Website:** azure.microsoft.com/en-us/overview/azure-stack/

- **Webcast:** azure.microsoft.com/en-us/overview/azure-stack/webcast/

- **Tech docs:** azure.microsoft.com/en-us/documentation/azure-stack/

Azure: portal.azure.com

Hewlett Packard Enterprise support for the Microsoft Azure Stack Technical Preview (Proof-of-Concept) release is provided on a best effort basis. Contact mas2016preview@hpe.com.

Learn more at
www8.hp.com/us/en/products/servers/solutions.html?compURI=1485572#tab=TAB2

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