



Dell EMC™ PowerEdge™ MX7000

Dell EMC PowerEdge MX streamlined routine tasks including deployment, firmware updates, server migration, and storage provisioning as compared to HPE Synergy

The Dell EMC PowerEdge MX solution required 89.4 percent less admin time to deploy multiple server nodes and 15 fewer steps to update firmware on multiple systems

For IT administrators, spending time maintaining servers comes with the territory. However, the right platform and associated tools can dramatically reduce the time and effort routine management tasks require, which can in turn free these professionals to pursue endeavors that propel business forward, such as responding more quickly to customers and focusing on special projects.

The new Dell EMC PowerEdge MX blade server platform includes Intel® Xeon® Scalable processors, Intel NVMe solid-state drives, and the Intel Ethernet Network Adapter XXV710. For management, it leverages OpenManage™ Enterprise - Modular Edition, an embedded application providing hardware management and software-defining capabilities. When integrated with a full version of OpenManage Enterprise, this powerful tool can allow admins to carry out a management task on dozens or hundreds of servers in little more time than they'd need to perform the task once.

At Principled Technologies, we executed a series of tasks in both a Dell EMC PowerEdge MX environment with OpenManage Enterprise and an HPE Synergy environment with OneView for Synergy. The management tools embedded in the Dell EMC solution let us complete the tasks—which involved server and storage provisioning along with server deployment and component maintenance—in less time and often with fewer steps. This efficiency can grow exponentially in large-scale operations, returning an enormous amount of time to your IT admins.



Spend 89.4% less time on admin tasks

48 seconds vs. 7 minutes 36 seconds



Reduce the number of steps by 2/3

6 steps vs. 21 steps



Provision assignable storage with zero downtime

HPE Synergy requires powering off the system

A next-generation modular chassis with a unified management interface

The new Dell EMC PowerEdge MX brings modular servers and storage together in a single chassis with fast networking powered by 25Gbps Intel Ethernet Network Adapter XXV710 controllers. Software-defined storage makes in-chassis, distributable storage available to all server nodes, greatly increasing the flexibility and efficiency of your data center.

Another advantage of the PowerEdge MX platform is OpenManage Enterprise - Modular Edition, an embedded management system that integrates with the Dell EMC management solution OpenManage Enterprise. OpenManage Enterprise gives you the ability to deploy and manage your modular servers the same way you'd manage all your other Dell EMC systems. OpenManage Enterprise - Modular Edition includes enhancements for hardware-specific tasks such as in-chassis storage provisioning and advanced networking configuration.

How we tested

To measure the speed of several common management tasks on both solutions, we set up two environments: a Dell EMC PowerEdge MX7000 chassis with a PowerEdge MX740c compute sleds, and an HPE Synergy 12000 chassis with HPE Synergy 480 Gen10 compute modules.

The Dell EMC PowerEdge MX system we tested included:

- The 7U modular Dell EMC PowerEdge MX7000 chassis, with two distinct redundant PowerEdge MX Scalable Fabrics, a third redundant storage fabric, and a fault-tolerant interlinked Management Services module to manage compute, storage, and networking fabrics
- The Dell EMC PowerEdge MX740c compute sleds, which pack two Intel Xeon Scalable processors, up to 24 DDR4 DIMM slots, 3 TB of memory, and up to six 2.5-inch drives into one single-width sled

We tested the two platforms' manageability using four common deployment and management scenarios: deploying a server, updating firmware, migrating a server from a heterogeneous platform, and provisioning assignable storage.

What we discovered

The Dell EMC PowerEdge MX solution allowed us to deploy multiple servers in 89 percent less admin time, update firmware on multiple systems using less than one-third the number of steps, and provision new storage in half as many steps with zero downtime. In addition, the PowerEdge MX solution allowed us to migrate a server profile from a traditional 2U rack server into the PowerEdge MX compute nodes, something that the HPE Synergy solution couldn't do. Read on for the details.



Kinetic infrastructure: Providing organizations with the flexibility that modern business demands

Being able to use compute and storage resources effectively as business needs shift is an essential part of a successful data center. To address this need, Dell EMC has developed kinetic infrastructure, which it says, "delivers the benefits of a modular data center solution while leveraging configuration flexibility at the storage-drive level."¹

Use case 1: Deploying a server node

The routine task of deploying new servers can burden your IT staff to varying degrees, depending on the system you choose. When you perform this task on the Dell EMC PowerEdge MX solution, its centralized management software, OpenManage Enterprise, can save a great deal of time. Though both OpenManage Enterprise and HPE OneView for Synergy support the deployment of server nodes, deployment through OpenManage Enterprise requires less administrative time and effort, which can reduce the risk of human error, especially with large numbers of servers.

To quantify the savings of using the PowerEdge MX management tools to deploy new server nodes, we began by noting the administrative time and number of steps required to deploy a single server node on each solution. As we show below, the Dell EMC PowerEdge MX solution handled the deployment in 33.9 percent less admin time, taking 2 minutes and 18 seconds versus the HPE Synergy solution's 3 minutes and 29 seconds. It also required two fewer steps. Note: The time and steps include building a profile template on each solution.

Time and steps to deploy a server (first single instance)

Time in min:sec

Dell EMC PowerEdge MX7000 with OpenManage Enterprise

02:18

12 steps

HPE Synergy with OneView for Synergy

03:29

14 steps

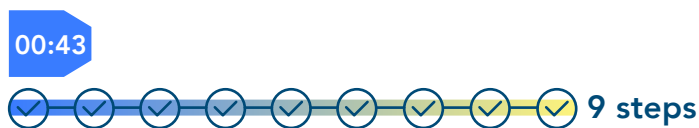


To understand the experience of deploying multiple servers using each solution, we started by deploying a single additional server node. The results from this second test exclude the time and steps needed to build a profile template on each solution and cover only deployment. As we show below, the Dell EMC PowerEdge MX solution required more steps to deploy this instance, but used 71.7 percent less admin time, taking only 43 seconds versus the HPE Synergy solution's 2 minutes and 32 seconds. That's because an HPE OneView for Synergy profile can't be applied while a system is powered on, so the administrator must manually power off a system, wait for the profile deployment, and then manually power the server back on.

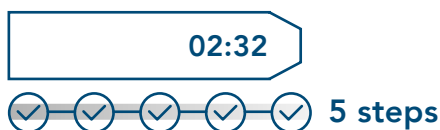
Time and steps to deploy a server (subsequent single instance)

Time in min:sec

Dell EMC PowerEdge MX7000 with OpenManage Enterprise



HPE Synergy with OneView for Synergy



Meet the management tools that help the Dell EMC PowerEdge MX platform give time back to IT admins

OpenManage Enterprise is a one-to-many systems management console for the data center. The console offers a modern HTML5 GUI and deploys as a virtual appliance for VMware ESXi™, Microsoft® Hyper-V, and KVM environments. In our experience, it was easy to use the OVF format for deployment in the VMware ESXi environment. It can discover and inventory on IPV4 and IPV6 networks for up to 8,000 devices, including Dell EMC rack servers, Dell EMC tower servers, and Dell EMC blades and chassis.²

Learn more about
OpenManage Enterprise:
www.dell.com/OMEnterprise.

OpenManage Enterprise – Modular Edition is an embedded systems management solution for the Dell EMC PowerEdge MX chassis. It delivers the primary abilities of OpenManage Enterprise within the server chassis, and can manage servers across several PowerEdge MX chassis. A web/RESTful API interface manages all nodes, including compute, storage, and networking.³

Learn more about OpenManage
Enterprise – Modular Edition:
www.dell.com/OME-Modular.

We then performed three more server deployments. On the Dell EMC PowerEdge MX platform, this took less than a minute of admin time, 89.4 percent less than the 7 minutes 36 seconds needed on the Synergy solution. It also required the same nine steps necessary to deploy a single server because the management tools deployed the servers simultaneously. In contrast, because the process on the HPE Synergy platform requires manual intervention and is therefore sequential, deploying three servers required three times the time and steps needed to deploy a single server. With Synergy, admins use Server Profile Templates to create server profiles that they then deploy individually to servers. This contrasts with OpenManage Enterprise, which can directly deploy, straight from a template, to multiple servers at once, with no additional administrative time or intervention required.

Time and steps to deploy a server (three subsequent instances)

Time in min:sec

Dell EMC PowerEdge MX7000 with OpenManage Enterprise



HPE Synergy with OneView for Synergy



The more servers you maintain, the more time the **Dell EMC PowerEdge MX7000** with OpenManage Enterprise saves you

Each solution can deploy operating systems along with a server profile. For HPE Synergy, we used an add-on component within the Synergy frame called Image Streamer. With Image Streamer, you can capture an operating system you have previously deployed, and then use predefined bundles of scripts available from an HPE GitHub repository to package and redeploy the OS to other systems within the Synergy platform. The process creates an answer file that enables zero-touch deployments, but there's a significant caveat: The deployment will fail if there is any deviation in hardware between the original system and subsequent systems. For example, if you capture an image on a system with a single processor, you can't redeploy the image to a system with two processors. Even minor discrepancies, such as the mezzanine cards being located in different slots than on the original system, will cause the deployment job to fail.

For the Dell EMC PowerEdge MX platform, we used the Boot to Network ISO feature in the deployment of a template through OpenManage Enterprise. This enables users to customize an OS with all drivers already integrated, and perform an unattended installation that is hardware agnostic. We deployed our unattended Microsoft Windows 2016 Standard image to both PowerEdge MX740c servers and standalone PowerEdge R730 servers that used OpenManage Enterprise. Each deployment resulted in a completely configured, ready-to-use deployment despite the differences in hardware.

What happens when you use each solution's tools to deploy a profile and server operating system to a server with different hardware than the source?

Original system and target system hardware configured **identically**

OpenManage Enterprise with Boot to Network ISO

✓ **Deployment succeeds**

OneView for Synergy with Image Streamer

✓ **Deployment succeeds**

Original system and target system hardware configured **differently**

✓ **Deployment succeeds**

✗ **Deployment fails**

The economy of scale that the Dell EMC PowerEdge MX platform offers would yield increasing savings as the number of servers deployed increased. Regardless of the number of servers or different hardware configurations your admins deployed—dozens or hundreds—the number of steps required on the Dell EMC PowerEdge MX platform would remain constant, and the time would increase relatively modestly, while the administrative burden of performing these tasks on the HPE platform would expand quickly.

Use case 2: Updating firmware

Like deploying new servers, updating firmware is a routine task that can vary considerably, depending on the management tool your solution uses. On the Dell EMC PowerEdge MX solution, once a user has created a firmware baseline, management software alerts them when it detects that firmware is out of compliance. To complete the updates, the user need only run a consistency check, select the servers they want to update, and schedule the deployment. IT teams that work only day shifts benefit enormously from the ability to schedule updates because no one needs to rearrange their schedule to supervise the update process.

The process is different on the HPE Synergy platform. First, unless you install additional software in each target system—and in the case of ESXi servers, leverage a Linux[®] proxy server—you must power down each target system to apply the firmware updates through the OneView for Synergy console because they’re applied through the profile. This makes the process somewhat serialized, so the more servers you need to update, the more time and steps the process requires. (Note: In our test results, the administrator time includes the period of waiting before the admin can power on the server.)

To quantify the savings of using the PowerEdge MX management tools to update firmware, we began by deploying a single server node on each solution. As we show below, performing the update on the Dell EMC PowerEdge MX solution required 40.9 percent less admin time: 2 minutes and 30 seconds versus the HPE Synergy solution’s 4 minutes and 14 seconds. It also required three fewer steps.

Time and steps to update firmware (first single instance)

Time in min:sec

Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy



Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy



To understand the experience of updating firmware across multiple servers using each solution, we started by updating a single additional server node. This allows us to leverage an existing firmware baseline for OpenManage Enterprise, and an already updated server profile template within OneView for Synergy. As we show, performing the update on the Dell EMC PowerEdge MX solution required 60.8 percent less admin time: 1 minute and 28 seconds versus the HPE Synergy solution’s 3 minutes and 45 seconds. It also required one less step.

However, the real advantage of using the embedded management tools of the Dell EMC PowerEdge MX solution came to light when we performed three more firmware updates. On the Dell EMC platform, this took only 1 minute and 30 seconds of admin time—just two more seconds than it took to update a single server and the same six steps. Even if a user dramatically increased the number of systems they were updating, our testing indicates that the admin time and steps required would continue to hold steady. In less than two minutes, a user could run a consistency check on hundreds of systems, learn which systems were out of compliance, and schedule the update.

Time and steps to update firmware (subsequent single instance)

Time in min:sec

Dell EMC PowerEdge MX with OpenManage Enterprise



Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy



HPE Synergy with OneView for Synergy



In contrast, because the process on the HPE Synergy platform is manual and therefore serialized, updating firmware on three servers required 3 times the time and steps needed to deploy a single server: 11 minutes and 15 seconds of admin time and 21 steps. Compared to this time, the minute and a half the Dell EMC PowerEdge MX solution needed represents a savings of 86.6 percent.

Additionally, HPE OneView for Synergy does not alert the user when new firmware becomes available. Instead, the user must search for the firmware, download it to their system, upload it to the Synergy solution, and then make the firmware available to each host through either a one-off installation, or through changing the baseline of the server profile template. The user would need to repeat this process every time HPE released a new firmware update, creating more time and hassle for IT staff.

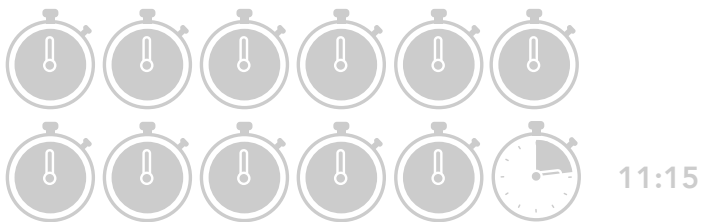
Time and steps to update firmware (three subsequent instances)

Time in min:sec

Dell EMC PowerEdge MX with OpenManage Enterprise



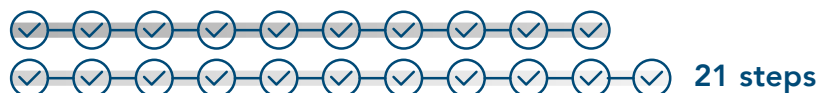
HPE Synergy with OneView for Synergy



Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy



Use case 3: Migrating a server profile from a traditional rack server into the PowerEdge MX compute nodes

Dell EMC OpenManage Enterprise supports the MX platform, but isn't strictly bound to it. This makes it possible to add servers from across the entire Dell EMC server portfolio. In contrast, some HPE management tools are more closely tethered to their hardware. For example, HPE OneView for Synergy is dedicated to only the Synergy platform. The more general HPE OneView tool can provide a view of HPE OneView for Synergy, but can't directly interact with it. This means you can't import servers from outside the Synergy chassis and manage them through OneView for Synergy.

The charts above shows the time and steps we needed to migrate a profile from a standalone server to the Dell EMC PowerEdge MX blade environment: 1 minute and 53 seconds and 18 steps. We could not complete this task on the HPE Synergy platform using its native tools.

Time and steps to migrate a server from a heterogeneous platform Time in min:sec

Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy

Option not available

Dell EMC PowerEdge MX with OpenManage Enterprise



HPE Synergy with OneView for Synergy

Option not available

Use case 4: Provisioning assignable storage

The Dell EMC PowerEdge MX uses a modular approach to data provisioning. Its chassis supports a SAS drive sled from which admins can add and assign more disks, dynamically adding or removing storage as they need.

As we show below, provisioning storage on the Dell EMC PowerEdge MX solution required 15.6 percent less admin time: 1 minute and 37 seconds versus the HPE Synergy solution's 1 minute and 55 seconds. It also required six fewer steps.

Most importantly, the MX embedded OpenManage Enterprise - Modular Edition platform allowed us to perform the disk additions without downtime. Adding the disks and rescanning within the OS were the only steps necessary to expand the storage. HPE OneView for Synergy provisions the assignable storage through changes to the server profile, which requires a powered-off state to apply the changes. That means the simple task of provisioning additional storage incurs additional downtime.

Time and steps to provision assignable storage

Time in min:sec

Dell EMC PowerEdge MX with OpenManage Enterprise - Modular Edition



HPE Synergy with OneView for Synergy



Dell EMC PowerEdge MX with OpenManage Enterprise - Modular Edition



HPE Synergy with OneView for Synergy





Conclusion

Moving to a modular software-defined blade chassis solution such as the Dell EMC PowerEdge MX, powered by Intel Xeon Scalable processors, Intel NVMe solid-state drives, and the Intel Ethernet Network Adapter XXV710, can be a winning proposition for many reasons. In this study, we focused on the management advantages of making this shift and found that the powerful tools embedded in this platform, OpenManage Enterprise - Modular Edition, in tandem with centralized OpenManage Enterprise, streamlined tasks in a way that could translate to enormous time savings over an HPE Synergy solution, especially in large-scale enterprises.

Few jobs are completely free of routine tasks. However, smart organizations invest in solutions and tools that let their employees minimize the resources they must devote to them. Give your administrators more time to innovate and add business value by selecting the Dell EMC PowerEdge MX platform with OpenManage Enterprise - Modular Edition and OpenManage Enterprise.

To find out more about Dell EMC PowerEdge MX, visit <https://www.dell.com/en-us/servers/modular-infrastructure.htm>.

- 1 Hormuth, Robert, "Kinetic Infrastructure is the Path to Full Composability," accessed February 7, 2019, <https://blog.dell.com/en-us/making-composability-kinetic/>
- 2 Dell EMC, "OpenManage Enterprise," accessed February 9, 2019, www.dell.com/OMEnterprise
- 3 Dell EMC, "OpenManage Enterprise – Modular Edition," accessed February 9, 2019, www.dell.com/OME-Modular

We concluded our hands-on testing on February 7, 2019. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on January 15, 2019 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

The table below presents our findings in detail.

| Use case | Admin time (min:sec) | | Dell EMC win | Steps | | Dell EMC win |
|--|-----------------------|-------------|--------------|-----------------------|-------------|--------------|
| | Dell EMC PowerEdge MX | HPE Synergy | % Less time | Dell EMC PowerEdge MX | HPE Synergy | Fewer steps |
| 1a: Deploying a server node (first single instance) | 0:02:18 | 0:03:29 | 33.97 | 12 | 14 | 2 |
| 1b: Deploying a server node (subsequent single instance) | 0:00:43 | 0:02:32 | 71.71 | 9 | 5 | -4 |
| 1c: Deploying a server node (three subsequent instances) | 0:00:48 | 0:07:36 | 89.47 | 9 | 15 | 6 |
| 2a: Updating firmware (first single instance) | 0:02:30 | 0:04:14 | 40.94 | 10 | 13 | 3 |
| 2b: Updating firmware (subsequent single instance) | 0:01:28 | 0:03:45 | 60.89 | 6 | 7 | 1 |
| 2c: Updating firmware (three subsequent instances) | 0:01:30 | 0:11:15 | 86.67 | 6 | 21 | 15 |
| 3: Provisioning assignable storage | 0:01:37 | 0:01:55 | 15.65 | 5 | 11 | 6 |
| 4: Migrating a server from traditional rack server | 0:01:53 | N/A | N/A | 18 | N/A | N/A |

Note: HPE provides both a general management tool, HPE OneView, and a tool dedicated to the Synergy platform. It is not possible to perform the management tasks in our study on Synergy using HPE OneView. Therefore, in our testing, we used OneView for Synergy.

System configuration information

The table below presents detailed information on the systems we tested.

| Server enclosure configuration information | HPE Synergy 12000 |
|--|---|
| Power supplies | |
| Number of power supplies | 18 |
| Vendor and model number | HPE 798095-B21 |
| Wattage of each (W) | 2650 |
| Cooling fans | |
| Total number of fan modules | 30 |
| Vendor and model number | HPE 809097-001 |
| I/O modules | |
| Model | 6 x Synergy 12Gb SAS Connection Module |
| Model | 6 x Synergy 20Gb Interconnect Link Module |
| Model | 6 x Frame link module |
| Model | 2 x Synergy Composer |
| Model | 2 x Synergy Image Streamer |
| Model | 3 x Synergy D3940 Storage Module |

| Server configuration information | HPE Synergy 480 Gen10 v1 |
|-------------------------------------|---|
| General | |
| Number of processor packages | 2 |
| Number of cores per processor | 14 |
| Number of hardware threads per core | 28 |
| System power management policy | Default |
| BIOS | I42 v1.46 |
| Date of BIOS update | 10/05/2018 |
| Operating System name and build | Windows Server 2016 |
| Processor | |
| Vendor and model | Intel Xeon Gold 5120 CPU |
| Stepping | H0 (QMS8, SR3BB) |
| Socket type | FCLGA3647 |
| Core frequency (GHz) | 2.2 |
| Bus speed | 10.4 GT/s UPI |
| L1 cache | 14 x 32 KB 8-way set associative instruction caches 14 x 32 KB 8-way set associative data caches |
| L2 cache | 14 x 1 MB 16-way set associative caches |
| L3 cache | 19.25 MB non-inclusive shared caches |

| Server configuration information | HPE Synergy 480 Gen10 v1 |
|--|---------------------------------|
| Platform | |
| Vendor and model number | HPE SY480 Gen10 - 1 |
| Motherboard model number | 871942-B21 |
| Memory module(s) | |
| Total RAM in system (GB) | 192 |
| Vendor and model number | HP 840757-091 |
| Type | DDR4 |
| Speed (MHz) | 2,666 |
| Speed running in the system (MHz) | 2,666 |
| Size (GB) | 16 |
| Number of RAM module(s) | 12 |
| RAID controller | |
| Vendor and model number | HPE Smart Array P416ie-m SR G10 |
| Firmware version | 1.65 |
| Cluster storage | |
| Number of drives | 2 |
| Drive vendor and model | HPE VK000480GWCFE |
| Drive size (GB) | 480 |
| Drive information (speed, interface, type) | 6Gbps SATA SSD |
| NIC | |
| Vendor and model number | Synergy 3820C 10/20Gb CNA |
| Firmware version | 7.17.19 |

| Server configuration information | HPE Synergy 480 Gen10 v1 |
|-------------------------------------|--------------------------|
| General | |
| Number of processor packages | 2 |
| Number of cores per processor | 14 |
| Number of hardware threads per core | 28 |
| System power management policy | Default |
| BIOS | I42 v1.46 |
| Date of BIOS update | 10/05/2018 |
| Operating System name and build | Windows Server 2016 |

| Server configuration information | | HPE Synergy 480 Gen10 v1 |
|--|---|--------------------------|
| Processor | | |
| Vendor | Intel | |
| Name | Xeon | |
| Model number | Gold 5120 CPU | |
| Socket type | FCLGA3647 | |
| Core frequency (GHz) | 2.2 | |
| Bus speed | 10.4 GT/s UPI | |
| L1 cache | 14 x 32 KB 8-way set associative instruction caches 14 x 32 KB 8-way set associative data caches | |
| L2 cache | 14 x 1 MB 16-way set associative caches | |
| L3 cache | 19.25 MB non-inclusive shared caches | |
| Platform | | |
| Vendor and model number | HPE SY480 Gen10 - 1 | |
| Motherboard model number | 871942-B21 | |
| Memory module(s) | | |
| Total RAM in system (GB) | 384 | |
| Vendor and model number | HP 840757-091 | |
| Type | DDR4 | |
| Speed (MHz) | 2,666 | |
| Speed running in the system (MHz) | 2,666 | |
| Size (GB) | 16 | |
| Number of RAM module(s) | 24 | |
| RAID controller | | |
| Vendor and model number | HPE Smart Array P416ie-m SR G10 | |
| Firmware version | 1.65 | |
| Cluster storage | | |
| Number of drives | 2 | |
| Drive vendor and model | HPE VK000480GWCFE | |
| Drive size (GB) | 480 | |
| Drive information (speed, interface, type) | 6Gbps SATA SSD | |
| NIC | | |
| Vendor and model number | Synergy 3820C 10/20Gb CNA | |
| Firmware version | 7.17.19 | |

| Server configuration information | HPE Synergy 480 Gen10 v2 |
|-------------------------------------|---|
| General | |
| Number of processor packages | 2 |
| Number of cores per processor | 14 |
| Number of hardware threads per core | 28 |
| System power management policy | Default |
| BIOS | I42 v1.46 |
| Date of BIOS update | 10/05/2018 |
| Operating System name and build | Windows Server 2016 |
| Processor | |
| Vendor | Intel |
| Name | Xeon |
| Model number | Gold 5120 CPU |
| Socket type | FCLGA3647 |
| Core frequency (GHz) | 2.2 |
| Bus speed | 10.4 GT/s UPI |
| L1 cache | 14 x 32 KB 8-way set associative instruction caches 14 x 32 KB 8-way set associative data caches |
| L2 cache | 14 x 1 MB 16-way set associative caches |
| L3 cache | 19.25 MB non-inclusive shared caches |
| Platform | |
| Vendor and model number | HPE SY480 Gen10 - 2 |
| Motherboard model number | 871942-B21 |
| Memory module(s) | |
| Total RAM in system (GB) | 384 |
| Vendor and model number | HP 840757-091 |
| Type | DDR4 |
| Speed (MHz) | 2,666 |
| Speed running in the system (MHz) | 2,666 |
| Size (GB) | 16 |
| Number of RAM module(s) | 24 |
| RAID controller | |
| Vendor and model number | HPE Smart Array P416ie-m SR G10 |
| Firmware version | 1.65 |

| Server configuration information | HPE Synergy 480 Gen10 v2 |
|--|---------------------------|
| Cluster storage | |
| Number of drives | 2 |
| Drive vendor and model | HPE VK000480GWCFE |
| Drive size (GB) | 480 |
| Drive information (speed, interface, type) | 6Gbps SATA SSD |
| NIC | |
| Vendor and model number | Synergy 3820C 10/20Gb CNA |
| Firmware version | 7.17.19 |

How we tested

Dell EMC PowerEdge MX

Use case 1a: Deploying MX740c server node using OpenManage Enterprise (first single instance)

1. From the home screen, select Configuration→Deploy.
2. Click the Create template drop-down menu, and select From Reference Device.
3. Create the Template Name, verify the Clone Reference Server radio button is selected, and click Next.
4. On the reference device, select the server to clone, leave all elements selected, and click Finish.
5. Select the template you created, and click Edit Network.
6. In the Identity Pool drop-down menu, select the desired identity pool, and click Finish.
7. Return to the Configuration screen, and select Deploy template.
8. On the target option, select the device, and click OK.
9. Click Next.
10. Check the Boot to Network ISO. Input the ISO path and the IP Address where the file is located. Click Next.
11. In iDRAC Management IP, click Next.
12. In NIC configuration, click Assigned identity. Click Finish.

Total steps: 12

Use case 1b: Deploying an MX740c server node using OpenManage Enterprise (subsequent single instance)

1. From the home screen, select Configuration→Deploy.
2. Select the template you created, and click Edit Network
3. In the Identity Pool drop-down menu, select the desired identity pool, and click Finish.
4. Returning to the Configuration screen, select Deploy template.
5. On the target option, click Select to choose the target device, and click OK.
6. Click Next.
7. Check the Boot to Network ISO. Input the ISO path and the IP address where the file is located. Click Next.
8. In iDRAC Management IP, click Next.
9. In NIC configuration, click Assigned identity. Click Finish.

Total steps: 9

Use case 1c: Deploying multiple MX740c server nodes using OpenManage Enterprise (three subsequent instances)

1. From the home screen, select Configuration→Deploy.
2. Select the template you created, and click Edit Network.
3. In the Identity Pool drop-down menu, select the desired identity pool, and click Finish.
4. Return to the Configuration screen, and select Deploy template.
5. On the target option, select the device, and click OK.
6. Click Next.
7. Check the Boot to Network ISO. Input the ISO path and the IP address where the file is located. Click Next.
8. In iDRAC Management IP, click Next.
9. In NIC configuration, click Assigned identity. Click Finish.

Total steps: 9

Use case 2a: Updating firmware in OpenManage Enterprise (first single instance)

1. From the OpenManage Enterprise homepage, click Configuration→Firmware.
2. On the Firmware tab, select Create Baseline.
3. In the Baseline Information dialog box, enter a name for the baseline, and click Add.
4. In the Add Firmware catalog, enter a name, select Latest component firmware versions on Dell.com, and click Finish.
5. On the Create Firmware Baseline dialog box, click Next.
6. On the Select Devices screen, click the Select Groups radio button, and click Select Groups.
7. On the Select Groups screen, click Servers, and click Finish.
8. When the compliance check has completed, click View Report.
9. Check the box beside any non-compliant node(s). Click Update Firmware.
10. Select Update Now. Click Update.

Total steps: 10

Use case 2b: Updating firmware in OpenManage Enterprise (subsequent single instance)

1. From the OpenManage Enterprise homepage, click Configuration→Firmware.
2. On the Firmware tab, select the previously created baseline.
3. Click Check Compliance.
4. When the compliance check has completed, click View Report.
5. Check the box beside any non-compliant node(s). Click Update Firmware.
6. Select Update Now. Click Update.

Total steps: 6

Use case 2c: Updating firmware in OpenManage Enterprise (three subsequent instances)

1. From the OpenManage Enterprise homepage, click Configuration→Firmware.
2. On the Firmware tab, select the previously created baseline.
3. Click Check Compliance.
4. When the compliance check has completed, click View Report.
5. Check the box beside any non-compliant node(s). Click Update Firmware.
6. Select Update Now. Click Update.

Total steps: 6

Use case 3: Migrating a server from a traditional rack server

Adding standalone server to OpenManage Enterprise

1. From the Home Menu screen, click Monitor→Discovery.
2. On the Monitor Screen, click Create.
3. Under Devices to discover, select Server for Device Type.
4. After a pop-up screen appears asking how would you like to connect to server(s), select iDRAC, and click OK.
5. In the IP/Hostname/Range box, enter the iDRAC IP address of the server and put the credentials in the username and password boxes, and click Finish.

Creating a template of the standalone

6. From the Home Menu screen, click Configuration→Deploy.
7. On the Configuration screen, click the Create template drop-down menu, and select From Reference Device.
8. After a pop-up screen appears, enter name and description of template, make sure the Clone Reference Server radio button is selected, and click Next.
9. In the Device Selection, click select Device button, choose the standalone server in the choices, and click OK.
10. In the Configuration elements, select the elements you wish to clone, and click Finish.
11. Click Edit Network, assign the identity pool and the VLAN network, and click Finish.

Deploying the template

12. From the Configuration menu, select the template, and click the Deploy Template button.
13. On the pop-up screen that appears, click Yes.
14. Under Select devices, click Select.
15. Select the device to target, click OK, and click Next.
16. On Boot to Network ISO, click Next.
17. On iDRAC Management IP, click Next
18. On NIC configurations, select assign identities, and click Finish.

Total steps: 18

Use case 4: Provisioning assignable storage

1. From the OpenManage Enterprise Modular homepage, select Devices→Storage.
2. Check the box beside the entry for Storage Sled 5, and click View Details.
3. Click Edit Assignments.
4. If not selected, the click Drive-Assigned radio button. In the list of hard drives, check the desired hard drive, and click Assign to Drive Slot.
5. Select the desired slot and server to assign the drive to it, and click Assign.

Total steps: 5

HPE Synergy

Use case 1a: Deploying an HPE Synergy server node (first single instance)

Creating Server Profile Template

1. From the home screen, select the OneView drop-down menu, and select Server Profile Template.
2. Click Create Server Profile Template.
3. Provide the Name and description for the Template. (We included a brief description of the target hardware suitable for the template.) Under Server profile, use the pull-down menus to select the hardware type and enclosure groups.
4. Select the pre-built OS deployment plan.
5. Verify or modify the unattend entries displayed. Note the currently empty management NIC.
6. Scroll down to the Connections sections, and click Add Connection.
7. Name the NIC, and select a pre-defined network to attach. Click Add.
8. Scroll back up to the OS Deployment section, and select the newly created connection from the Management NIC pull-down menu.
9. Click Create.

Creating Server Profile and deploying OS

10. In the upper-right portion of the screen, click Actions, and select Create server profile.
11. Provide the name and description of the server profile. Use the drop-down menu to select the appropriate server for deployment.

Note: The selected hardware must exactly match the source hardware for the golden image capture. This includes ensuring the same number of processors, and identical placement for each adapter type. Any hardware deviation will result in a failed deployment.

12. Scroll down to verify or modify all settings inherited from the template.
13. Click Create.
14. Upon profile completion, click Actions, and select Power On to complete the OS deployment. To watch the progress and verify completion, click Actions and select Launch console.

Total steps: 14

Use case 1b: Deploying an HPE Synergy server node (subsequent single instance)

Repeat steps 10 through 14 from the **Creating Server Profile and deploying OS** section above one time.

Total steps: 5

Use case 1c: Deploying an HPE Synergy server node (three subsequent instances)

Repeat steps 10 through 14 from the **Creating Server Profile and deploying OS** section above three times.

Total steps: 15

Use case 2: Updating firmware

Modifying the template

1. In the OneView console, select Server profile templates.
2. Select the template you want to update.
3. Click Actions→Edit.
4. Scroll down to the firmware section, and use the pull-down menu to select the firmware baseline you want to apply.
5. Select the Firmware only option.

Note: Updates can be applied through the use of SUT, but that requires individual installation on to each machine you want to manage, and in the cases of ESX, an external Linux proxy server.

6. Click OK.

Applying the update to a server

7. In the OneView console, select Server profiles.
8. Select a server indicating "The server profile is inconsistent with its server profile template".
9. Click Actions→Power off.
10. Select the yellow alert, and expand it.
11. To apply the new baseline to the powered down server, click Update from Template.
12. Click Yes, update.
13. When the update is complete, click Actions→Power on.

Total steps: 13

Use case 2b: Updating firmware (subsequent single instance)

Repeat steps 7 through 13 from the **Applying the update to a server** section above one time.

Total steps: 7

Use case 2c: Updating firmware (three subsequent instances)

Repeat steps 10 through 14 from the **Applying the update to a server** section above three times.

Total steps: 21

Use case 3: Migrating a server from a traditional rack server

HPE OneView for Synergy is dedicated to the Synergy platform, and cannot natively copy profiles or templates from external sources, including c7000 blade servers or ProLiant standalone servers.

Use case 4: Provisioning in-chassis storage

1. In the OneView console, select Server Profiles.
2. Highlight the server profile of the server targeted for storage expansion.
3. Click Power off.
4. Click Momentary press, and wait for the server status to indicate Power off.
5. When the power is off, click Actions→Edit.
6. Scroll down to the Local Storage section, and click the pencil icon beside SAS Mezz 1 Storage Controller.
7. Click Add Logical JBOD.
8. Provide a name for the JBOD set, and select the number of disks and type of drives you want to provision from the in-chassis storage drawer. Select Erase on Delete. Click Add.
9. Click OK.
10. Click OK to complete the profile changes that will add the storage.
11. When the profile status shows Update Completed, click Actions→Power on.

Total steps: 11

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