Dell EMC™ ProDeploy set up a production-ready environment in less time and fewer steps

Compared to an in-house, entry-level admin, a Dell Technologies-certified engineer installed and configured a Dell EMC solution faster and more efficiently

Adding resources to your data center can help you meet key business goals quickly. The faster admins can deploy and configure new hardware, the sooner your critical applications will have access to resources that could boost revenue streams, expand a customer base, or promote other positive business outcomes. Choosing Dell EMC™ ProDeploy to install and configure your new Dell EMC hardware could allow your organization to feel the impact of new resources sooner than deploying with in-house, entry-level admins.

In our data center, a Dell Technologies-certified engineer installed and configured a Dell EMC solution of Dell EMC PowerEdge™ R740 servers, Dell EMC PowerSwitch S4048-ON switches, and a Dell EMC Unity array in 68 percent less time than our in-house admin deployed the same solution.

In addition, ProDeploy required little from our in-house project manager, which allowed them to do other work. A Dell Technologies-certified engineer deploying Dell EMC hardware in your data center could mean your IT staff would have more time to spend on other strategic IT initiatives.

4x faster planning and deployment

82% less project-planning time

68% less deployment time

Follows best practices to ensure proper deployment

Figure 1: Illustration of the Dell EMC solution. Source: Principled Technologies.

First things first: Save critical time by planning deployment with a Dell Technologies project manager

Project planning can help make even the most complex solution deployment less frustrating and time consuming. Planning phases give IT teams time to understand necessary planning processes, read supporting documentation, and learn toolsets before touching any hardware. Planning a deployment can (and some might say *should*) include validating power and connectivity requirements, determining site readiness, and reviewing best practices. Without these tasks, organizations could see serious delays and performance impacts. However, Dell Technologies project managers and engineers from ProDeploy already know the approaches, tools, and best practices for Dell EMC solutions.

Before a Dell Technologies engineer did any physical work to deploy the solution in Figure 1 (for detailed configuration information of the solution, see the section System configuration information), a Dell Technologies project manager guided the deployment through the planning phase. They gathered and documented the project requirements and developed a detailed project roadmap and implementation plan with our in-house project manager that highlighted best deployment paths and best practices. Our in-house staff played a role in only the planning phase of the ProDeploy deployment; the Dell Technologies-certified engineer handled the hardware unboxing, racking, and deployment and the Dell Technologies project manager assisted with planning. Choosing ProDeploy can significantly minimize your IT staff's involvement in planning, which allows them to focus on other tasks.

Without ProDeploy, our entry-level admin had to spend time planning the deployment of the solution in Figure 1. Both deployments (with and without ProDeploy) needed a project-planning phase, but as Figure 2 shows, the Dell Technologies project manager saved our IT staff significant time compared to our entry-level person planning on their own.
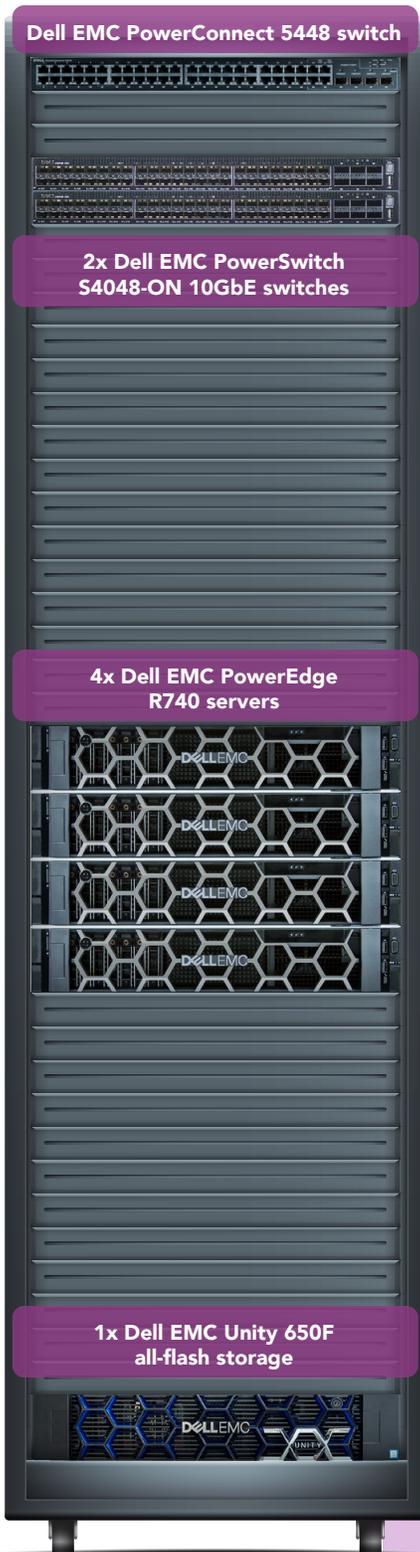
Required involvement from entry-level admin
Less time is better

with ProDeploy

Planning: 2h 35min — Total time: 8h 1min (4x faster)

without ProDeploy (entry-level admin)

Planning: 14h 45min — Total time: 32h 5min

Figure 2: Time required of an in-house, entry-level admin with and without Dell EMC ProDeploy service. Source: Principled Technologies.

A ProDeploy engineer needed less time than our entry-level admin

For the ProDeploy deployment, our entry-level admin spent 2 hours and 35 minutes planning the deployment with a Dell Technologies project manager before the Dell Technologies-certified engineer arrived at our datacenter. Those 2 hours and 35 minutes completed our involvement; we did not need to be involved in any further planning or deployment. Over the course of two business days, the Dell Technologies-certified engineer spent 5 hours and 26 minutes physically installing and configuring the PowerEdge servers, networking components, Unity array, and software.

Without ProDeploy, we spent 32 hours and 5 minutes installing and configuring the solution over six business days. Figure 3 breaks down deployment in business days. Highlights include the following:

- With ProDeploy, unboxing and racking the PowerEdge servers, networking components, and the Unity array took 83 percent less time and saved 2 hours and 9 minutes compared to the time it took our in-house, entry-level admin. ProDeploy saved 2 hours and 45 minutes when cabling the solution.
- Setting up the networking components with ProDeploy saved nearly 1 hour and 58 minutes and took 85 percent less time.
- Following deployment best practices took longer for our entry-level admin because they required deployment documentation for guidance.
- With ProDeploy, configuring the Dell EMC Unity array, upgrading its firmware and software, and performing a health check on the array saved 1 hour and 3 minutes and took 42 percent less time.
- With ProDeploy, installing the OS, updating the server firmware, setting up VMware vCenter®, and updating VMware ESXi™ saved a sizable chunk of time—almost 4 hours—and took 60 percent less time.

Time spent on deployment each day
Less time is better

ProDeploy engineer   8h 1min (4x faster)

| Mon | Tues |

Entry-level admin   32h 5min

| Mon | Tues | Wed | Thurs | Fri | Mon |

Figure 3: Comparison of time required to complete server deployment for a Dell Technologies-certified engineer and an in-house, entry-level admin. Source: Principled Technologies.

Table 1 breaks down the deployment times by stage of installation and configuration in hours and minutes.

Table 1: Comparison of time (in hours:minutes) required to complete each stage of the deployment process for an in-house, entry-level admin and a Dell Technologies-certified engineer. Source: Principled Technologies.

Stage	Entry-level admin	ProDeploy engineer	ProDeploy percentage less time
Planning	14:45	2:35	82%
Racking hardware & cabling	5:55	1:01	82%
Configuring networking	2:18	0:20	85%
Configuring OS & firmware	6:38	2:39	60%
Configuring storage	2:29	1:26	42%
Total deployment time without planning stage	17:20	5:26	68%
Total planning and deployment time	32:05	8:01	75%

Day-by-day breakdown: ProDeploy vs. in-house deployment

Table 2 shows how our in-house admin and the Dell Technologies-certified engineer spent their time on the first day. Without ProDeploy, we spent the first 4 hours confirming implementation details with our in-house project manager. It took the Dell Technologies-certified engineer 1 hour and 38 fewer minutes to plan the deployment; unbox, rack, and cable the solution; conduct a health check; update the server firmware; install the OS; configure the Ethernet switch; set up vCenter; and update ESXi than it took us to plan this first day and unbox, rack, and cable the PowerEdge servers, networking components, and Unity array.

Table 2: Comparison between an in-house, entry-level admin and a Dell Technologies-certified engineer for time (in hours:minutes) required to deploy the solution during day one. Source: Principled Technologies.

Stage	Entry-level admin	ProDeploy engineer
Planning	4:00	2:35
Unboxing and racking	2:35	0:26
Initial cabling	1:15	0:35
Checking server health		0:25
Updating server firmware		0:28
OS installation		0:12
Ethernet switch config		0:20
vCenter setup		0:21
ESXi updates		0:50
Time spent deploying the Dell EMC solution	7:50	6:12

Table 3 shows how our admin without ProDeploy and the Dell Technologies-certified engineer spent their time on the second day. In addition to the deployment, our admin had to address unrelated administrative and routine tasks that needed immediate attention. The Dell Technologies-certified engineer, however, was able to focus and complete the deployment.

Table 3: Comparison between an in-house, entry-level admin and a Dell Technologies-certified engineer for time (in hours:minutes) required to deploy the solution during day two. Source: Principled Technologies.

Stage	Entry-level admin	ProDeploy engineer
Planning	1:15	
Initial cabling	2:05	
Storage configuration		0:23
Storage firmware/software upgrade		0:38
**Installation of OME and SAE		0:48
Time spent deploying the Dell EMC solution	3:20	1:49

It took our in-house, entry-level admin four more business days to finish planning the installation as well as to finish installing and configuring the new PowerEdge servers, networking components, and Unity arrays from Dell EMC. That's six business days total, compared to the two business days it took the Dell Technologies-certified engineer. An organization would have had the new PowerEdge servers, networking components, and Unity array up and running six days earlier (including Saturday and Sunday) by using ProDeploy. After two days, our admin still had a lot to do, as Table 4 shows.

Table 4: Breakdown of in-house, entry-level admin time (in hours:minutes) on the remaining days. Source: Principled Technologies.

Stage	Entry-level admin	ProDeploy engineer
(Day 3) Wednesday		
Planning	3:00	
Time spent deploying the Dell EMC solution	3:00	0:00
(Day 4) Thursday		
Planning	3:45	
Health check	0:30	
Time spent deploying the Dell EMC solution	4:15	0:00
(Day 5) Friday		
Planning	1:15	
Configuring storage	0:42	
Upgrading storage firmware	1:17	
Server firmware update	0:42	
OS installation	0:27	
Ethernet switch config	0:53	
ESXi updates	0:36	
Time spent deploying the Dell EMC solution	5:52	0:00
(Day 6) Monday		
Planning	1:30	
Ethernet switch config	1:25	
vCenter setup	0:48	
ESXi updates	1:00	
Installing OME and SAE	3:05	
Time spent deploying the Dell EMC solution	7:48	0:00

Get additional post-deployment care from Dell Technologies

After installing and configuring the solution, our in-house admin and the Dell Technologies-certified engineer initiated post-deployment services. These were mostly checks to ensure things were running smoothly. However, the Dell Technologies-certified engineer took some extra time to do things beyond deployment. In addition to collecting environment configuration across all the platforms, they performed a final health check, validated that they had implemented all configuration best practices, and completed the remaining documentation.

Compliance with COVID-19 restrictions

Before the Dell Technologies engineer visited our data center, we informed them of our social distancing policy and face covering requirement to help reduce the potential spread of the virus causing coronavirus disease 2019 (COVID-19). The engineer complied by maintaining a distance of at least six feet from others and by wearing a mask that covered their mouth and nose at all times.

Conclusion

Choosing ProDeploy to install and configure new Dell EMC hardware means your organization can get new data center resources to applications more quickly without tying up too much of an admin's time. In our data center:

- The Dell Technologies-certified engineer installed and configured the Dell EMC solution in 68 percent less time, saving 11 hours and 54 minutes and allowing our in-house admin to focus on organizational demands and other strategic initiatives.
- Installing and configuring the Dell EMC solution with ProDeploy reduced the total planning and deployment time by 75 percent, 4 times faster than our in-house admin.
- The Dell Technologies-certified engineer needed only 5 hours and 26 minutes over two business days to deploy the Dell EMC solution.
- Without ProDeploy, it took more than 17 hours over six business days for our in-house, entry-level admin to install and configure the same solution.
- Familiarity with the solution components allowed the Dell Technologies-certified engineer to complete tasks, such as configuring the network, faster than our in-house, entry-level admin, who sometimes needed documentation and guidance from our project manager.

With ProDeploy, your organization can realize a faster, more efficient deployment with minimal impact on your in-house IT staff.

We concluded our hands-on testing on July 7, 2020. 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 June 23, 2020 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

For our calculations, we found that the Dell EMC ProDeploy time of 8 hours and 1 minute was just under a quarter of the in-house, entry level time of 32 hours and 5 minutes. Therefore, we assume that a Dell EMC ProDeploy-certified engineer could do four deployments in the time of one in-house, entry level IT admin-conducted deployment and thus is four times faster.

Table 5: Times (in hours:minutes) for each stage of deployment.

Task	In-house, entry-level IT admin	Dell EMC ProDeploy-certified engineer
Planning	14:45	2:35
Unboxing and racking	2:35	0:26
Initial cabling	3:20	0:35
Storage configuration	0:42	0:23
Storage firmware/software upgrade	1:17	0:38
Health check	0:30	0:25
Server firmware update	0:42	0:28
OS installation	0:27	0:12
Ethernet switch config	2:18	0:20
vCenter setup	0:48	0:21
ESXi updates	1:36	0:50
Installation of OME and SAE	3:05	0:48
Total time	32:05	8:01

System configuration information

Table 6: Detailed information for the deployed servers. Source: Principled Technologies.

Server configuration information	Dell EMC PowerEdge R740	
BIOS name and version	2.6.4	
Non-default BIOS settings	none	
Operating system name and version/build number	VMware ESXi™ 7.0 15843807	
Date of last OS updates/patches applied	6/22/20	
Power management policy	Balanced	
Processor		
Number of processors	2	
Vendor and model	Intel® Xeon® Silver 4216	
Core count (per processor)	16	
Core frequency (GHz)	2.1	
Stepping	7	
Memory module(s)		
Total memory in system (GB)	96	
	Memory module A	Memory module B
Number of memory modules	2	2
Vendor and model	Samsung® M393A2K43BB1-CTD6Q	Samsung M393A4K40CB2-CTD7Q
Size (GB)	16	32
Type	DDR4	DDR4
Speed (MHz)	2,666	2,666
Speed running in the server (MHz)	2,666	2,666
Storage controller		
Vendor and model	Dell PERC H740P Mini	
Cache size (GB)	4	
Firmware version	50.9.4-3025	
Driver version	7.712.50.00	
Local storage (type A)		
Number of drives	2	
Drive vendor and model	Micron® MTFDDAK480TDN	
Drive size (GB)	480	
Drive information (speed, interface, type)	6GB/s, SAS, SSD	

Server configuration information	Dell EMC PowerEdge R740
Local storage (type B)	
Number of drives	1
Drive vendor and model	Seagate ST600MM0069
Drive size (GB)	600
Drive information (speed, interface, type)	12GB/s, SAS, HDD
Network adapter (type A)	
Vendor and model	Broadcom Adv. Dual 10GBASE-T Ethernet
Number and type of ports	4
Driver version	21.60.22.11
Network adapter (type B)	
Vendor and model	Intel Ethernet Server Adapter X520
Number and type of ports	2
Driver version	1.7.1.26
Cooling fans	
Vendor and model	Nidec Ultraflo XN44V-A00
Number of cooling fans	6
Power supplies	
Vendor and model	Dell PWR SPLY, 750W
Number of power supplies	2
Wattage of each (W)	750

Table 7: Detailed information for the deployed storage. Source: Principled Technologies.

Storage configuration information	Dell EMC Unity 650F
Software Version	5.0.3.0.5.014
Number of drives	10
Drive vendor and model	Samsung MZ-ILT1T9A
Drive size	1.92TB
Protocol	SAS
Gb/s	12Gb/s

Table 8: Detailed information for the deployed switches. Source: Principled Technologies.

Switch configuration information	Dell EMC PowerConnect 5448
Port type A	
Type of ports	Gigabit ethernet
Number of ports	48
Port type B	
Type of ports	Combo gigabit SFP
Number of ports	4

How we tested

Configuring Unity 650F

1. Visit https://www.dell.com/support/home/en-us/product-support/product/unity-family/overview, and download the Dell EMC Unity Connection Utility.
2. When the download is finished, click Run.
3. At the Select Setup Language screen, Select English, and click OK.
4. At the Welcome screen, click Next.
5. At the Choose Install Folder, accept defaults, and click Next.
6. At the Pre-Installation Summary screen, click Install.
7. Check Run Connection Utility, and click Finish.

Connecting to the storage and configuring management IP address

1. In the connection utility, select Auto Discover, and click Next.
2. Select the System, and click Next.
3. Enter the management IP information, and click Next.
4. Review the information, and click Next.
5. Click Deploy.

Running the initial configuration wizard

1. At the introduction screen, click Next.
2. Enter the DNS server address, and click Next.
3. At the NTP server screen, click Add.
4. Enter the NTP server IP, and click Next.
5. Apply the Unisphere License, and click Next.
6. Until the initial configuration wizard completes, click Next.
7. Check Run Connection Utility, and click Finish.

Creating a storage pool

1. On left Unisphere pane, under Storage, click Pools.
2. Click +.
3. Enter a Pool name and description.
4. Select Extreme Performance Tier, and click Next.
5. Select all available drives, and click Next.
6. At the Capability Profile Name screen, click Next.
7. At the Summary screen, click Finish.

Creating a NAS server

1. Under Storage, select File>NAS Servers.
2. Click the add icon.
3. Create a server name, and choose the appropriate pool and storage processor.
4. Click Next.
5. Select the Ethernet port, and set the IP address, subnet mask, and Gateway.
6. Click Next.
7. Check Enable NFSv3 and NFSv4.
8. On DNS, Replication, and Summary, click Next.
9. Click Finish.

Creating a file system

1. Under Storage, select File>File Systems.
2. Click the add icon.
3. Create a name and description.
4. Click Next.
5. On File-level Retention, click Next.
6. Select the appropriate pool, set its size, and check Thin.
7. On subsequent screens, check Next.
8. Click Finish.

Discovering and adding multiple ESXi hosts

1. On left Unisphere pane, under Access, click VMware.
2. To connect to the vCenter server, click +.
3. At the Find ESXi Hosts screen, enter the vCenter credentials, and click Find.
4. Select the appropriate ESXi hosts, and click Next.
5. At the VSA Provider screen, click Next.
6. At the Summary screen, click Finish.

Installing VMware ESXi

1. Using the USB, boot to the VMware ESXi installation media.
2. To Continue, press Enter.
3. To Accept and Continue, press F11 key.
4. Under Storage Device, select the installation drive, and press Enter.
5. For keyboard layout, select US Default, and press Enter.
6. Enter the root password twice, and press Enter.
7. At the Confirm Install window, press F11.
8. At the Installation Complete window, press Enter.
9. To configure the system after rebooting, press F2.
10. Log in with root credentials, and press Enter.
11. Scroll to Configure Management Network, and press Enter.
12. Scroll to IPv4 Configuration, and press Enter.
13. Scroll to Static IPv4, and use the spacebar to select it.
14. Set the IPv4 address, Subnet Mask, and Default gateway.
15. Press Enter.
16. Scroll to IPv6 Configuration, and press Enter.
17. Scroll to Disable IPv6, and use the spacebar to select it.
18. Press Enter.
19. Scroll to DNS Configuration, and press Enter.
20. Scroll to manually configure DNS, and use the spacebar to select it.
21. Add the Primary DNS Server and the Alternate DNS Server, and provide the hostname for the system.
22. Scroll to Custom DNS Suffixes, and press Enter.
23. Add the suffix that is required for testing, and press Enter.
24. To accept the changes, press Esc.
25. To confirm changes, press Y. The system will reboot.
26. To configure the system after rebooting, press F2.
27. Log in with root credentials, and press Enter.
28. Scroll to Troubleshooting Options, and press Enter.
29. Select Enable ESXi Shell, and press Enter.
30. Select Enable SSH, and press Enter.
31. Scroll to Restart Management Agents, and press Enter.
32. Press F11.
33. To exit, press Esc.
34. To log out, press Esc.

Deploying VMware vCenter Server® 7.0

1. Using a USB drive, on a Windows server or VM, locate the VMware-VCSA installer image using USB.
2. Mount the image, navigate to the vcsa-ui-installer folder, and double-click win32.
3. Double-click installer.exe.
4. Click Install.
5. Click Next.
6. Accept the terms of the license agreement, and click Next.
7. Ensure that the vCenter Server with an Embedded Platform Services Controller is selected, and click Next.
8. Enter the FQDN or IP address of the host onto which you are deploying the vCenter Server Appliance.
9. Provide the server's username and password, and click Next.
10. To accept the certificate of the host you chose to connect to, click Yes.
11. Provide a name and password for the vCenter Appliance, and click Next.
12. Set an appropriate appliance size, and click Next.
13. Select the appropriate datastore, and click Next.
14. At the Configure Network Settings page, configure the network settings as appropriate for your environment, and click Next.
15. Review your settings, and click Finish.
16. When the deployment completes, click Continue.
17. At the Introduction page, click Next.
18. At the Appliance configuration page, select the time synchronization mode and SSH access settings, and click Next.
19. At the CEIP page, click Next.
20. At the Ready to complete page, click Finish.
21. At the Warning pop-up, click OK.
22. Once Stage 2 completes successfully, click Close.

Adding the servers to vCenter

1. Log into vCenter.
2. In the left pane, right-click vCenter, and select New Datacenter.
3. Enter the name of your datacenter, and press OK.
4. Right-click your datacenter, and select Add Host.
5. In Name and location, add the IP address of your host, and click Next.
6. In Connection settings, to log into your ESXi host, enter the username and password, and click Next.
7. In Host summary, verify your host's information, and click Next.
8. In Assign license, choose the appropriate license for your host, and click Next.
9. In Lockdown mode, leave the host lockdown as default (Disabled), and click Next.
10. In VM location, choose the location where your VMs will be organized, and click Next.
11. In Ready to complete, verify your settings, and click Finish.
12. Complete steps 4 through 11 for the remaining three servers.

Downloading and installing OpenManage Enterprise

1. From the support site, download the openmanage_enterprise_ovf_format.zip file, and extract the file to a location accessible by the VMware vSphere Client.
2. In vSphere Client, select File>Deploy OVF Template.
3. On the Local file option, click Upload files, select the OVF and VMDK packages, and click Next.
4. Name the VM, select the Datacenter, and click Next.
5. Select the host on which you want to deploy the appliance VM, and click Next.
6. Review the details, and click Next.
7. Accept the License agreements, and click Next.
8. Select storage option, choose Thin provision, and click Next.
9. Select Networks, and click Next.
10. Enter DNS, hostname, Gateway, network address (IPV4), time zone, NTP server address, and click next.
11. Review the settings, and click Finish.

Configuring OpenManage Enterprise

1. In a web browser, navigate to the IP of the OpenManage Enterprise VM, and log in.
2. On the Home tab, choose Discover Devices.
3. Click Add, and in the Device Type dropdown, choose Server.
4. Select Dell iDRAC, and click OK.
5. In the IP/Hostname/Range box, enter the IP range of the servers.
6. For the servers, enter the login credentials.
7. Select Run Now, and click Finish.
8. For the virtual machine files, select the datastore, and click Next.
9. On the Disk Format page, to pre-allocate physical storage space to VMs, click Thick provision.
10. Review the selected options, and click Finish.

Downloading and installing SupportAssist Enterprise

1. From the support site, download the OVF file, and extract the file to a location accessible by the VMware vSphere Client.
2. In vSphere Client, select File>Deploy OVF Template.
3. On the local file option, click Upload files, select the OVF and VMDK packages, and click Next.
4. Name the VM, select the Datacenter, and click Next.
5. Select the host on which you want to deploy the appliance VM, and click Next.
6. Review the details, and click Next.
7. Accept the license agreements, and click Next.
8. Select storage option, choose Thin provision, and click Next.
9. Select the networks, and click Next.
10. Enter DNS, hostname, Gateway, network address (IPV4), time zone, NTP server address, and click Next.
11. Review the settings, and click Finish.

Configuring SupportAssist Enterprise

1. In a web browser, navigate to the IP of the SupportAssist Enterprise VM, and log in.
2. On the Devices tab, choose Add.
3. In Device Type, select iDRAC, enter the IP address of the host, name the host, and choose create new credentials account.
4. Name the credentials, and select the device type, operating system, username, and password. Click Save.
5. Select the account credentials you created, and select Next.
6. For the additional three servers, complete steps 1 through 5.

This project was commissioned by Dell Technologies.