The science behind the report:

Using Dell ProDeploy Plus for Infrastructure can improve deployment times for Dell technology

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report **Using Dell ProDeploy Plus for Infrastructure can improve deployment times for Dell technology**.

We concluded our hands-on testing on March 28, 2023. 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 March 27, 2023 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to http://facts.pt/calculating-and-highlighting-wins.
Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 3: Results of our testing.

Stage	Our admin	Dell-certified engineer	ProDeploy Plus percentage less time
Planning	10:58	3:34	67.45%
Unboxing and racking	0:34	0:17	50.69%
Initial cabling	0:49	0:14	70.57%
Configuring storage	3:09	1:34	50.54%
Updating Ethernet switch firmware and OS	2:13	0:19	85.58%
Configuring Ethernet switch	2:24	0:07	95.00%
Updating server firmware	2:11	0:30	76.94%
Installing ESXi	0:34	0:35	N/A
Setting up vCenter	0:49	0:34	31.31%
Total deployment time without planning stage	12:43	4:10	67.21%
Total planning and deployment time	23:41	7:44	67.32%

System configuration information

Table 4: Detailed information on the systems we tested.

Server configuration information	2 x Dell PowerEdge R750
BIOS name and version	1.9.2
Operating system name and version/build number	VMware ESXi 8.0.0 Build 21203435
Date of last OS updates/patches applied	03/27/2023
Power management policy	Balanced
Processor	
Number of processors	2
Vendor and model	Intel Xeon Silver 4309Y CPU
Core count (per processor)	8
Core frequency (GHz)	2.8
Stepping	M1
Memory module(s)	
Total memory in system (GB)	16
Number of memory modules	2
Vendor and model	Micron MTA9ASF1G72PZ-3G2R1
Size (GB)	8
Type	PC4-25600
Speed (MHz)	3200
Speed running in the server (MHz)	2666
Storage controller	
Vendor and model	Dell PERC H745 Front
Cache size	4GB
Firmware version	51.16.0-4076
Driver version	7.721.03.00
Local storage	
Number of drives	2
Drive vendor and model	Micron MTFDDAK480TDT
Drive size (GB)	480
Drive information (speed, interface, type)	6Gbps SATA SSD
Embedded network adapter	
Vendor and model	Broadcom BCM5720
Number and type of ports	2 x 1GbE
Firmware version	22.31.6
Driver version	218.0.300.0

Server configuration information	2 x Dell PowerEdge R750
Integrated network adapter	
Vendor and model	Broadcom BCM57414
Number and type of ports	2 x 25GbE
Firmware version	22.31.13.70
Driver version	222.1.78.0
Cooling fans	
Vendor and model	Dell JF857
Number of cooling fans	6
Power supplies	
Vendor and model	Dell 6C11W
Number of power supplies	2
Wattage of each (W)	1400

Table 5: Detailed configuration information for the storage solution.

Storage configuration information	Dell PowerStore 3200T
Controller firmware revision	3.2.0.1
Number of storage controllers	2
Number of storage shelves	1
Number of drives per shelf	6
Drive vendor and model number	Samsung MZ-WLJ3T8A
Drive size (TB)	3.84
Drive information (interface, type)	NVMe SSD
NVRAM count	2
NVRAM size (GB)	8GB

Table 6: Detailed configuration information for the network switches we used.

Network switch configuration information	2 x Dell PowerSwitch S5248F-ON
Firmware revision	10.5.4.7.204
Number and type of ports	48 x SFP28 25GbE, 4 x QSFP28 100GbE, 2 x QSFP-DD 200GbE
Number and type of ports used in test	6 x SFP28 25GbE, 2 x QSFP28 100GbE
Non-default settings used	Jumbo frames enabled, VLT Interconnect

How we tested

Configuring ethernet switches

Configuring the out-of-band management ports

1. Using a serial connection, establish terminal connection to the primary switch.
2. Type `config` and press Enter.
3. Type `interface mgmt 1/1/1` and press Enter.
4. Type `no shutdown` and press Enter.
5. Type `no ip address dhcp` and press Enter.
6. Type `ip address ipsubnet` and press Enter, where `ipsubnet` is the desired IP with slash notation.
7. Type `exit` and press Enter.
8. Repeat steps 2-7 in the terminal of the secondary switch.

Configuring the switches for the network

1. In the terminal of the primary switch, type `config` and press Enter.
2. Type `hostname s5248on-1` and press Enter.
3. Type `ip name-server dnsaddress` and press Enter, where `dnsaddress` is the DNS address of the network.
4. Type `ip domain-name networkdomainname` and press Enter, where `networkdomainname` is the domain name of the network.
5. `Type management route 0.0.0.0/0 gatewayaddress` and press Enter, where `gatewayaddress` is the gateway address of the network.
6. Type `ntp server ntpaddress` and press Enter, where `ntpaddress` is the NTP address of the network.
7. Type `spanning-tree mode rstp` and press Enter.
8. Type `spanning-tree rstp priority 40960` and press Enter.
9. Type `exit` and press Enter.
10. Repeat steps 1-9 in the terminal of the secondary switch using a unique hostname and `spanning-tree rstp priority` set to `45056`.

Configuring virtual link trunking between the switches

1. In the terminal of the primary switch, type `config` and press Enter.
2. Type `interface range ethernet 1/1/55-1/1/56` and press Enter.
3. Type `description VLTi` and press Enter.
4. Type `mtu 9216` and press Enter.
5. Type `exit` and press Enter.
6. Type `vlt-domain 100` and press Enter.
7. Type `discovery-interface ethernet 1/1/55-1/1/56` and press Enter.
8. Type `backup destination switch2ip` and press Enter, where `switch2ip` is the IP address of the secondary switch set earlier.
9. Type `peer-routing` and press Enter.
10. Type `primary-priority 1` and press Enter.
11. Type `vlt-mac 00:11:22:33:44:55` and press Enter.
12. Type `exit` and press Enter.
13. Repeat steps 1-12 in the terminal of the secondary switch using the IP address of the primary switch as the `backup destination` and the `primary-priority` set to `8192`.

Configuring the PowerStore native VLAN

1. In the terminal of the primary switch, type `config` and press Enter.
2. Type `interface vlan 4000` and press Enter.
3. Type `description "PowerStore Internal Network"` and press Enter.
4. Type `no shutdown` and press Enter.
5. Type `exit` and press Enter.
6. Repeat steps 1-5 in the terminal of the secondary switch.

Configuring the LACP port channels

1. In the terminal of the primary switch, type `config` and press Enter.
2. Type `interface port-channel 100` and press Enter.
3. Type `description "LACP for PowerStore Node A"` and press Enter.
4. Type `vlt-port-channel 100` and press Enter.
5. Type `no shutdown` and press Enter.
6. Type `switchport mode trunk` and press Enter.
7. Type `switchport access vlan 4000` and press Enter.
8. Type `spanning-tree port type edge` and press Enter.
9. Type `exit` and press Enter.
10. Type `interface port-channel 101` and press Enter.
11. Type `description "LACP for PowerStore Node B"` and press Enter.
12. Type `vlt-port-channel 101` and press Enter.
13. Type `no shutdown` and press Enter.
14. Type `switchport mode trunk` and press Enter.
15. Type `switchport access vlan 4000` and press Enter.
16. Type `spanning-tree port type edge` and press Enter.
17. Type `exit` and press Enter.
18. Type `interface ethernet 1/1/1` and press Enter.
19. Type `channel-group 100 mode active` and press Enter.
20. Type `flowcontrol receive off` and press Enter.
21. Type `flowcontrol transmit off` and press Enter.
22. Type `exit` and press Enter.
23. Type `interface ethernet 1/1/2` and press Enter.
24. Type `channel-group 100 mode active` and press Enter.
25. Type `flowcontrol receive off` and press Enter.
26. Type `flowcontrol transmit off` and press Enter.
27. Type `exit` and press Enter.
28. Repeat steps 1-27 in the terminal of the secondary switch.

Configuring the iSCSI network

1. In the terminal of the primary switch, type `config` and press Enter.
2. Type `interface vlan 4093` and press Enter.
3. Type `description "iSCSI Network"` and press Enter.
4. Type `no shutdown` and press Enter.
5. Type `exit` and press Enter.
6. Type `interface range ethernet 1/1/3-1/1/48` and press Enter.
7. Type `description "Host iSCSI"` and press Enter.
8. Type `no shutdown` and press Enter.
9. Type `mtu 9216` and press Enter.
10. Type `flowcontrol receive on` and press Enter.
11. Type `flowcontrol transmit off` and press Enter.
12. Type `spanning-tree port type edge` and press Enter.
13. Type `exit` and press Enter.
14. Type `interface port-channel 100` and press Enter.
15. Type `switchport trunk allowed vlan 4093` and press Enter.
16. Type `exit` and press Enter.
17. Type `interface port-channel 101` and press Enter.
18. Type `switchport trunk allowed vlan 4093` and press Enter.
19. Type `exit` and press Enter.
20. Type `copy running-configuration startup-configuration` and press Enter.
21. Repeat steps 1-20 in the terminal of the secondary switch.

Install VMware ESXi 8.0

1. Using a 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 and Alternate DNS Servers 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 the VMware vCenter Server 8.0

1. On a Windows server or VM, locate the VMware-VCSA installer image.
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. Leave the default Center Server with an Embedded Platform Services Controller 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 for which you chose to connect, 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. Select Create a new SSO domain.
20. Provide an SSO Domain name and SSO Site name.
21. Provide a password and confirm it then click Next.
22. At the CEIP page, click Next.
23. At the Ready to complete page, click Finish.
24. At the Warning pop-up, click OK.
25. Once Stage 2 has completed successfully, click Close.

Adding the cluster and hosts to vSphere

1. Log into your vSphere Client.
2. In the left pane, right-click on the vCenter and select New Datacenter.
3. Enter a name for the datacenter and click OK.
4. Right-click on the datacenter and select New Cluster.
5. Enter the Name of the cluster and click Next.
6. On the Image page, click Next.
7. Review the settings and click Finish.
8. Right click on the cluster and select Add Hosts.
9. Enter the IPs or FQDNs and credentials of the ESXi hosts and click Next.
10. In Host summary, verify the hosts' information and click Next.
11. On the Import Image page, select the desired image and click Next.
12. On the Ready to complete page, review the information and click Finish.

Configuring the iSCSI Hosts

Adding the vMotion network

1. Log into your vSphere Client.
2. In the left pane, select the first host.
3. On the Configure tab, select Virtual switches.
4. On the existing vSwitch0, click Manage physical adapters.
5. Move the 1GbE adapters to the Active adapters section and click OK.
6. On the Configure tab, select VMkernel adapters in the Networking section.
7. Click Add Networking.
8. Select VMkernel Network Adapter and click Next.
9. Select the existing vSwitch0 and click Next.
10. Enter vMotion as the Network label and select the vMotion service under Available services, then click Next.
11. Select Use static IPv4 settings and enter the desired settings, then click Next.
12. Review the settings and click Finish.
13. Repeat steps 2-12 for each host.

Adding the iSCSI networks

1. Log into your vSphere Client.
2. In the left pane, select the first host.
3. On the Configure tab, select VMkernel adapters in the Networking section.
4. Click Add Networking.
5. Select VMkernel Network Adapter and click Next.
6. Create a New standard switch with MTU 9000.
7. Move the 25GbE adapters to the Active adapters section and click Next.
8. Enter iSCSI1 as the Network label and click Next.
9. Select Use static IPv4 settings and enter the desired settings, then click Next.
10. Review the settings and click Finish.
11. Click Add Networking.
12. Select VMkernel Network Adapter and click Next.
13. Select the newly created vSwitch1 as the existing standard switch and click Next.
14. Enter iSCSI2 as the Network label and click Next.
15. Select Use static IPv4 settings and enter the desired settings, then click Next.

16. Review the settings and click Finish.
17. On the Configure tab, select Virtual switches in the Networking section.
18. Expand the vSwitch1 section.
19. Click the … menu in the top-right of the iSCSI1 section of the diagram and click Edit Settings.
20. Select Teaming and failover.
21. In the Failover order section, enable the Override checkbox.
22. Move the first of the 25GbE adapters to the Unused adapters section and click OK.
23. Click the … menu in the top-right of the iSCSI2 section of the diagram and click Edit Settings.
24. Select Teaming and failover.
25. In the Failover order section, enable the Override checkbox.
26. Move the 25GbE adapter that was not moved in step 22 to the Unused adapters section and click OK.
27. Repeat steps 2-26 for each host.

Configuring the iSCSI software adapters

1. Log into your vSphere Client.
2. In the left pane, select the first host.
3. On the Configure tab, select Storage Adapters in the Storage section.
4. Click Add Software Adapter and select Add iSCSI adapter.
5. On the confirmation screen, click OK.
6. Once the iSCSI Storage Adapter is created and populated on the list, select it to bring up the Properties pane.
7. On the Dynamic Discovery tab, click Add.
8. Enter the desired settings and click OK.
9. On the Network Port Binding tab, select the two iSCSI port groups and click OK.
10. Click Rescan Adapter and ensure the target IPs are listed on the Static Discovery tab.
11. On the Advanced Options tab, click Edit.
12. Adjust the following settings:

    • DelayedAck: Disabled
    • LoginTimeout: 30
    • NoopInterval: 5

13. Repeat steps 2-12 for each host.

Configuring PowerStore

Connecting to PowerStore Manager

1. On a separate workstation, configure the network adapter with the following:

    • Static IP: 128.221.1.249
    • Netmask: 255.255.255.0
    • No gateway

2. Connect an ethernet cable directly from the workstation to the Node B service port.
3. Navigate to http://128.221.1.251 and log in.
4. Enter a new default password and click Update.

Running Initial Configuration Wizard

1. Accept the license agreement and click Next.
2. Enter the Cluster Name and change the Storage Configuration to Block Optimized.
3. Confirm the warning and wait for the PowerStore to reboot.
4. Once returned to the Initial Configuration Wizard, review the Name and Storage Configuration, then click Next.
5. On the Networks page, click Configure Now.
6. Enter the desired settings for the Management Network, reserving at least 3 IPs, and click Continue.
7. Enter the desired settings for the iSCSI Storage Network, reserving at least 2 IPs, and click Next.
8. Enter the DNS and NTP Server settings and click Next.
9. Enter the vCenter Information and PowerStore Credentials, then click Next.
10. Click View Full Details to review the configuration details then click Validate.

11. Once the configuration is validated, click Configure.
12. Once the configuration is completed, click Next.
13. Change the SupportAssist Type to Dell Secure Connect Gateway and enter the correct information, then click Configure.
14. Once the wizard is complete, navigate to address listed to continue in the PowerStore Manager.

Configuring email notification preferences

1. Click the Settings icon and navigate to SMTP Server in the Networking tab.
2. Click Enable an enter the SMTP settings.
3. Navigate to Email Notifications in the Users tab.
4. Add email notification subscribers.

Enabling SSH

1. Click the Settings icon and navigate to SSH Management in the Security tab.
2. Select the appliance and enable SSH.

Enabling HTTP redirect

1. Click the Settings icon and navigate to HTTP Redirect in the Security tab.
2. Enable HTTP Redirect.

Adding the iSCSI host group

1. Log into the PowerStore Manager.
2. Under the Compute tab, click Host Information.
3. Click Add Host.
4. Name the host and select ESXi as the operating system, then click Next.
5. Select iSCSI as the initiator type and click Next.
6. Select the first host and click Next.
7. Review the settings and click Finish.
8. Repeat steps 3-7 for each host.
9. On the Host Information page, click Add Host Group.
10. Name the host group and select each of the iSCSI hosts, then click Create.

Creating a storage volume

1. Log into the PowerStore Manager.
2. Under the Storage tab, click Volumes.
3. Click Create.
4. Enter the desired settings and click Next.
5. Select the iSCSI host group and click Next.
6. Review the settings and click Create.

Read the report at https://facts.pt/5gOqYFB ▶

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