The science behind the report:

Be production-ready sooner by using ProDeploy Plus for Enterprise

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 Be production-ready sooner by using ProDeploy Plus for Enterprise.

On April 17, 2019, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on April 17, 2019.

Our results

The table below presents our findings in detail. All times are hours and minutes.

Planning & design			
Category	Task	In-house deployment	ProDeploy Plus for Enterprise
ProDeploy Plus for Enterprise kickoff	Pre-engagement calls, design planning, and email time		2:22
Research & learning	Designing the deployment and reading administrator guides and installation material for Dell EMC™ Unity™ and Integrated Data Protection Appliance (IDPA)	16:25	

Admin time			
Category	Task	In-house deployment	ProDeploy Plus for Enterprise
Hardware setup	Unboxing, racking, and initial configuration	1:38	2:14
Dell EMC Unity configuration	Configuring and zoning fibre channel switch	2:19	2:05
	Creating storage pool		
	Configuring host access		
	Deploying five LUNs per system (block)		
	Deploying five shares per system (NFS)		
	Setting up Secure Remote Services		
	Configuring replication		
	Downloading service data files		
IDPA configuration	Configuring IDPA for the first time	9:31	3:14
	Installing Dell EMC Avamar™ Console for administration		
	Creating datasets, schedule, retention policy, and backup group		
	Installing SQL and filesystem plugins in Microsoft® SQL Server® VM		
	Adding client VM into backup group and initiating the backup		
	Integrating VMware vCenter® with Avamar		
	Configuring a DPA report for backup and adding SMTP server into DPA		
	Configuring DP search with the zone list including SQL domain		
	Creating install base request for IDPA		
Total time:		**29:53**	**9:55**

The data in the table below comes from our previous study that compared a solution deployment by ProDeploy Plus to deployment by an in-house administrator. All times are hours and minutes. The times are for the configuration of the servers and switches; we did not include other deployment tasks such as unboxing, racking, or cabling. We believe the tasks below reflect the more engaging hands-on work that an in-house admin must complete to add compute and networking resources to a data center. To read the full report, visit https://www.principledtechnologies.com/Dell/Deploying_new_solutions_with_ProDeploy_0218.pdf.

Admin time			
Category	Task	In-house deployment	ProDeploy Plus for Enterprise
Dell EMC PowerEdge™ servers configuration	Checking server health	6:57	3:05
	Updating server firmware		
	Installing the OS		
	Setting up vCenter		
	Updating VMware ESXi™		
Networking switches configuration	Zoning fiber channel fabric	2:45	1:10
	Configuring Ethernet switch		
	Total time:	**9:42**	**4:15**

System configuration information

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

Server configuration information	Dell EMC PowerEdge R630
BIOS name and version	2.9.1
Non-default BIOS settings	Virtualization enabled
Operating system name and version/build number	VMware ESXi 6.7
Date of last OS updates/patches applied	03/01/19
Power management policy	Performance
Processor	
Number of processors	2
Vendor and model	Intel® Xeon® E5-2603 v3
Core count (per processor)	6
Core frequency (GHz)	1.60
Stepping	1
Memory module(s)	
Total memory in system (GB)	64GB
Number of memory modules	4
Vendor and model	Samsung® M393A2K43BB1-CRC4Q
Size (GB)	16
Type	PC4-19200
Speed (MHz)	2,400
Speed running in the server (MHz)	2,400
Storage controller	
Vendor and model	Dell PERC H730 Mini
Cache size (MB)	1,024
Firmware version	25.3.0.0016
Driver version	6.602.35.0
Local storage	
Number of drives	4
Drive vendor and model	Dell Toshiba ST3300555SS
Drive size (GB)	300
Drive information (speed, interface, type)	15K, 6Gb SAS, HDD
Network adapter	
Vendor and model	Dell Broadcom 5720
Number and type of ports	4 x 1GbE

Server configuration information	Dell EMC PowerEdge R630
Driver version	7.10.61
Cooling fans	
Vendor and model	Dell R40W12BS1NB8
Number of cooling fans	7
Power supplies	
Vendor and model	Dell 0G6W6KX02
Number of power supplies	2
Wattage of each (W)	750

Storage configuration information	Dell EMC Unity 300	Dell EMC Unity 350F	Dell EMC Integrated Data Protection Appliance DP4400
Controller firmware revision	4.0	4.0	2.2
Number of storage controllers	1	1	1
Number of storage shelves	1	1	1
Number of drives per shelf	6	10	12
Drive vendor and model number	Seagate ST600MM0008	Samsung MZ ILS400N	Dell 9HXK6
Drive size (GB)	600	400	12
Drive information (speed, interface, type)	10K, 12Gb SAS, HDD	12Gb SAS, SSD	7.2K, 12Gb SAS, HDD

How we tested

Setting up VMware vSphere®

Installing VMware ESXi 6.7.0

We used the following steps to configure each server on our VMware environment:

1. Attach the installation media.
2. Boot the infrastructure server.
3. At the VMware Installer screen, press Enter.
4. At the EULA screen, to Accept and Continue, press F11.
5. Under Storage Devices, select the appropriate virtual disk, and press Enter.
6. For the keyboard layout, select US, and press Enter.
7. Enter the root password twice, and press Enter.
8. To start installation, press F11.
9. After the server reboots, press F2, and enter root credentials.
10. Select Configure Management Network, and press Enter.
11. Select the appropriate network adapter, and select OK.
12. Select IPv4 settings, and enter the desired IP address, subnet mask, and gateway for the server.
13. Select OK, and restart the management network.
14. Repeat steps 1 through 13 on the remaining infrastructure server.

Deploying and configuring vCenter Server® Appliance 6.7

We used the following steps to deploy vCenter Server appliance on the management server:

1. Mount installation ISO and launch the vcsa-setup.html file.
2. In the wizard that appears, click Next.
3. Accept the terms of the license agreement, and click Next.
4. Leave the default installation directory, and click Next.
5. Click Install.
6. Click Finish.
7. In the mounted image's top directory, open vcsa-setup.html.
8. When prompted, click Allow.
9. Click Install.
10. Accept the terms of the license agreement, and click Next.
11. Enter the FQDN or IP address of the host onto which the vCenter Server Appliance will be deployed.
12. Provide a username and password for the system in question, and click Next.
13. Accept the certificate of the host you chose to connect to by clicking Yes.
14. Select the appropriate data center, and click Next.
15. Select the appropriate resource, and click Next.
16. Provide a name and password for the virtual machine, and click Next.
17. Select Install vCenter Server with an Embedded Platform Services Controller, and click Next.
18. Select Create a new SSO domain.
19. Provide a password, and confirm it.
20. Provide an SSO Domain name and SSO Site name, and click Next.
21. Set an appropriate Appliance Size, and click Next.
22. Select an appropriate datastore, and click Next.
23. Select Use an embedded database (PostgreSQL™), and click Next.
24. At the Network Settings page, configure the network settings as appropriate for your environment, and click Next.
25. Review your settings, and click Finish.
26. When installation completes, click Close.
27. Log into the vCenter's web client at https://vcenter-ip-address/vsphere-client/?csp.
28. Add all necessary ESXi and vCenter licenses to the vCenter.

Adding hosts to vCenter Server

We used the following steps to add servers to vCenter:

1. Once you have logged into vCenter, navigate to Hosts and Clusters.
2. Select the primary site management vCenter.
3. Right-click the vCenter object, and select New Datacenter...
4. Enter a name for the new data center, and click OK.
5. Right-click the new data center, and click Add Host….
6. Enter the Host name or IP address, and click Next.
7. Enter the host connection user name and password, and click Next.
8. Review the host summary, and click Next.
9. Assign the appropriate license, and click Next.
10. Disable Lockdown mode, and click Next.
11. Leave the default VM location, and click Next.
12. Review the ready to complete summary, and click Finish.

Creating AD/DNS

We used the following steps to deploy an Active Directory/DNS server on our vCenter infrastructure:

Creating the virtual machine

1. In VMware vCenter, navigate to Virtual Machines.
2. To create a new VM, click the icon.
3. Leave Create a new virtual machine selected, and click Next.
4. Enter a name for the virtual machine, and click Next.
5. Place the VM on the desired host with available CPUs, and click Next.
6. Select the appropriate datastore to host the VM, and click Next.
7. Select the guest OS as Windows Server 2016, and click Next.
8. In the Customize Hardware section, use the following settings:
    a. Set the vCPU count to 4.
    b. Set the Memory to 16GB.
    c. Add 1 x 100GB VMDK for OS, DB, and logs. Set all VMDKs to thick provision eager zeroed.
    d. Attach a Windows Server 2016 ISO to the CD/DVD drive.
9. Click Next.
10. Click Finish.
11. When the VM creation process completes, launch the VM and continue with the Windows Server 2016 installation.

Installing Windows Server 2016

1. Boot the virtual machine to the Microsoft Windows Server® 2016 installation media. At the prompt, press any key to boot from the CD/DVD location.
2. Click Next.
3. Click Install Now.
4. Select Windows Server 2016 Datacenter Edition (Desktop Experience), and click Next.
5. Check I accept the license terms, and click Next.
6. Select the OS drive, and click Next.
7. After installation, enter a password for Administrator, and click Finish.
8. Install all Windows Updates, and reboot.

Installing Active Directory and DNS services

1. Login as test.local/administrator.
2. Launch Server Manager.
3. Click Manage Add Roles and Features.
4. At the Before you begin screen, click Next.
5. At the Select installation type screen, leave Role-based or feature-based installation selected, and click Next.
6. At the Server Selection Screen, select the server from the pool, and click Next.
7. At the Select Server Roles screen, select Active Directory Domain Services. Click Add Features when prompted, and click Next.
8. At the Select Features screen, click Next.
9. At the Active Directory Domain Services screen, click Next.
10. At the Confirm installation selections screen, check Restart the destination server automatically if required, and click Install.

Configuring Active Directory and DNS services

1. After the installation completes, a screen should pop up with configuration options. If not, click the Tasks flag in the upper-right section of Server Manager.
2. Click Promote this server to a Domain Controller.
3. At the Deployment Configuration screen, select Add a new forest. In the Root domain name field, type `test.local`, and click Next.
4. At the Domain Controller Options screen, leave the default values, and type `Password1` twice.
5. Click Next four times to accept default settings for DNS, NetBIOS, and directory paths.
6. At the Review Options screen, click Next.
7. At the Prerequisites Check dialog, allow the check to complete. If there are no relevant errors, check Restart the destination server automatically if required, and click Install.
8. When the server restarts, log on using test.local\Administrator and the specified password.

Setting up DHCP services

1. Launch Server Manager.
2. Click Manage Add Roles and Features.
3. At the Before you begin screen, click Next.
4. At the Select installation type screen, leave Role-based or feature-based installation selected, and click Next.
5. At the Server Selection Screen, select the server from the pool, and click Next.
6. At the Select Server Roles screen, select DHCP Server. Click Add Features when prompted, and click Next.
7. At the Select Features screen, click Next.
8. At the DHCP Server screen, click Next.
9. At the Confirm installation selections, check Restart the destination server automatically if required, and click Next.
10. Once the installation is finished, click Complete DHCP configuration.
11. At the DHCP Post-Install configuration wizard, click Next, and click Commit.
12. At the Summary dialog, click Close.
13. In the Add Roles and Features Wizard, click Close.
14. Click Start DHCP.
15. Expand test.local, and click IPv4. Right-click IPv4 New Scope.
16. At the New Scope Wizard Welcome screen, click Next.
17. In the Name field, type `test`, and click Next.
18. Enter the lowest IP address in your test setup for Start IP address, and the highest IP address for End IP address. Leave the Length and Subnet mask as defaults, and click Next.
19. Click Next eight times to accept default scope settings, and click Finish.
20. Close the DHCP Manager console.

Creating a SQL Server VM

We used the following steps to create a SQL Server VM for testing backup capability:

1. In VMware vCenter, navigate to Virtual Machines.
2. To create a new VM, click the icon.
3. Leave Create a new virtual machine selected, and click Next.
4. Enter a name for the virtual machine, and click Next.
5. Place the VM on the desired host with available CPUs, and click Next.
6. Select the appropriate datastore to host the VM, and click Next.
7. Select the guest OS as Windows Server 2016, and click Next.
8. In the Customize Hardware section, use the following settings:
   a. Set the vCPU count to 4.
   b. Set the Memory to 16GB.
   c. Add 1 x 100GB VMDK for OS, DB, and logs. Set all VMDKs to thick provision eager zeroed.
   d. Attach a Windows Server 2016 ISO to the CD/DVD drive.
9. Click Next.
10. Click Finish.
11. When the VM creation process completes, launch the VM, and continue with the Windows Server 2016 installation.

Installing Windows Server 2016

1. Boot the virtual machine to the Windows Server 2016 installation media. At the prompt, press any key to boot from the CD/DVD location.
2. Click Next.
3. Click Install Now.
4. Select Windows Server 2016 Datacenter Edition (Desktop Experience), and click Next.
5. Check I accept the license terms, and click Next.
6. Select the OS drive, and click Next.
7. After installation, enter a password for Administrator, and click Finish.
8. Install all Windows Updates, and reboot.

Installing Microsoft SQL Server Express 2017

1. Download the SQL Server 2017 Express Edition installation media to the virtual machine, and run the installer.
2. Select the Basic installation type.
3. Click Accept to accept the license agreement.
4. Leave the default SQL server installation location, and click Install.
5. When installation is complete, click Close.

Read the report at http://facts.pt/c3lmb7h ▶

This project was commissioned by Dell Technologies.