



Bring new systems to production readiness faster and with less effort from in-house administrators

With ProDeploy, a Dell EMC-certified engineer installed and configured a complete virtualization environment faster and more efficiently than an in-house administrator deployed the same solution using in-house processes

Adding hardware to a datacenter can boost an organization's capabilities and offer productivity enhancements that drive competitive advantages. Deploying and configuring new systems, however, can be time consuming for your IT staff. Using ProDeploy can get new compute, storage, and networking resources to your applications more quickly than using only an in-house administrator to set up new Dell EMC™ hardware.

In our datacenter at Principled Technologies, a Dell EMC-certified engineer, using ProDeploy's innovative set of processes, toolsets, and features, installed and configured a Dell EMC solution consisting of PowerEdge™ R730 servers, networking components, and storage arrays 66 percent faster than our in-house administrator.

Utilizing a Dell EMC-certified engineer to deliver your new solutions allows your in-house administrator to focus on crucial strategic initiatives, such as development and planning for new applications.

92%



less hands-on time for in-house admins

82%



less project-planning time

66%



faster time to deploy

Follows best practices to ensure proper deployment



Accelerate progress by leveraging a Dell EMC project manager who streamlines the project-planning phase

Project planning is incredibly important for a successful solution deployment but can be frustrating and time consuming. Ensuring a smooth deployment requires thorough project management that leverages planning processes, supporting documentation, and toolsets. Failure to validate compatibility or power and connectivity requirements, determine site readiness, and review best practices before implementation can lead to serious delays.

When you choose to use ProDeploy, Dell EMC assigns a dedicated project manager to guide your organization through the planning and management phases of your deployment. The Dell EMC project manager who deployed our solution gathered and documented the project requirements and helped our in-house administrator develop a detailed project roadmap and implementation plan highlighting critical path items and best practices. The planning helped us move the deployment forward and arrange for the Dell EMC-certified engineer to arrive and complete the deployment.

Our in-house administrator and the Dell EMC-certified engineer separately set up the solution on the right. For detailed configuration information of the Dell EMC solution, see [Appendix A](#).

Give your IT team more time to help drive business value

An in-house admin and a Dell EMC-certified engineer deployed the same solution in our datacenter. The in-house administrator played a role only in the planning of the ProDeploy deployment, and as the chart below shows, the in-house administrator spent nearly 31 more hours on the deployment without ProDeploy. The Dell EMC-certified engineer reduced our administrator's time commitment by 92 percent. Your team could devote that time savings to strategic datacenter initiatives that boost your business's value.

Required involvement from in-house admin

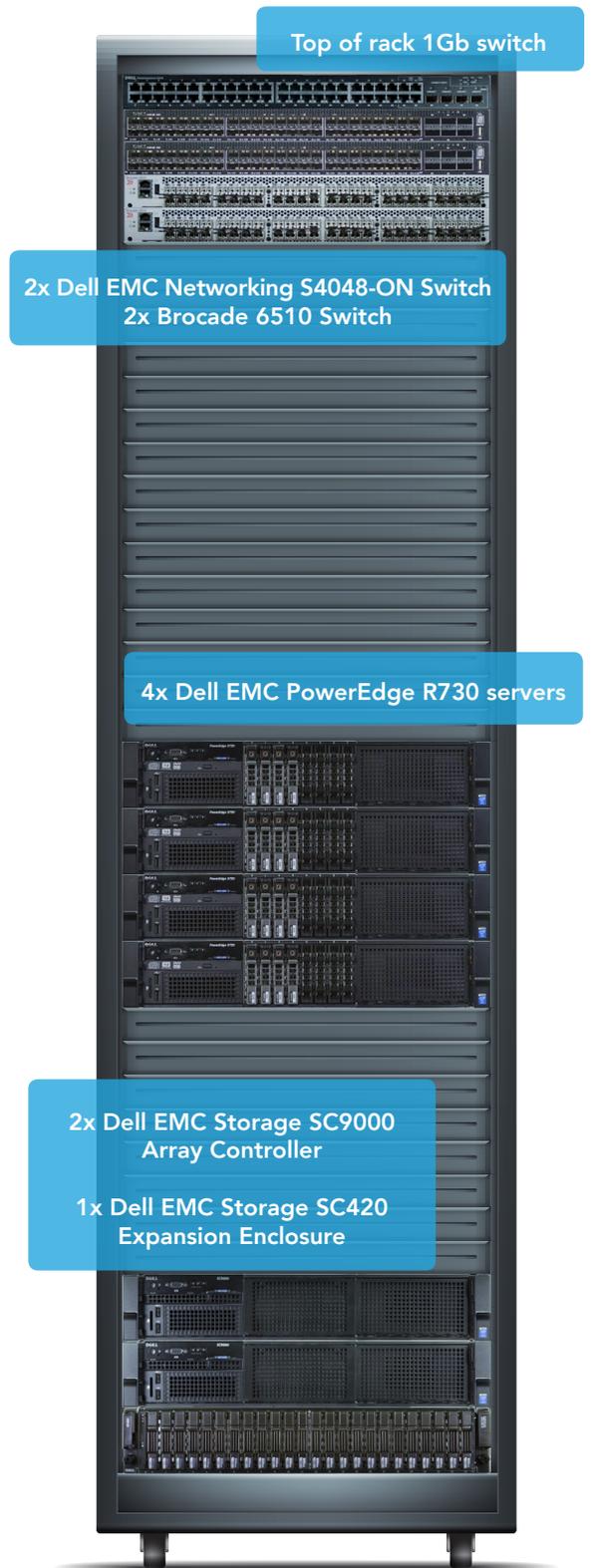
Less time is better

with ProDeploy

2h 30min

without ProDeploy

33h 11min



Summary: ProDeploy vs. an in-house administrator

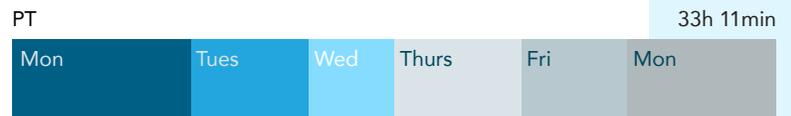
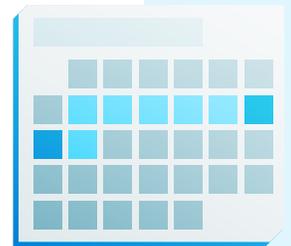
Our in-house administrator spent two and a half hours planning for the deployment with a Dell EMC project manager before the Dell EMC-certified engineer arrived at our datacenter. Those two and a half hours completed our involvement in the planning process with ProDeploy; we did not need to be involved in any further planning. Over the course of two business days, the Dell EMC-certified engineer spent eight hours and 44 minutes physically installing and configuring the PowerEdge servers, networking components, storage arrays, and software.

Without ProDeploy, we spent 33 hours and 11 minutes installing and configuring the solution over six business days. The figure below breaks down the business week. Highlights include the following:

- Unboxing and racking the PowerEdge servers, networking components, and storage arrays with ProDeploy took 45 percent less time and saved an hour and 16 minutes compared to the time it took our in-house administrator. ProDeploy saved an hour and 31 minutes when cabling the solution.
- Setting up the networking components with ProDeploy saved nearly an hour and 35 minutes and took 57 percent less time.
- Configuring the network took longer for our in-house administrator because he was unfamiliar with the technology and needed to rely on documentation for guidance.
- Configuring the Dell EMC storage array with ProDeploy saved an hour and 49 minutes and took 50 percent less time.
- Planning for the solution with ProDeploy saved a sizable chunk of time—11 and a half hours. That's 82 percent less time. The advantage with ProDeploy was due to a pre-visit planning session with the assigned Dell EMC project manager and the Dell EMC-certified engineer's familiarity with the Dell EMC solution components.

Time spent on deployment each day

Less time is better



The table below breaks down the total time spent on each stage of installation and configuration in hours. We used the assumption that a one-hour rate of completion is two hundred percent faster than a three-hour rate of completion to calculate the "faster" percentages.

Stage	In-house administrator	ProDeploy	ProDeploy percent faster
Planning	14:00	2:30	82.14%
Racking hardware	2:46	1:30	45.78%
Wiring	2:05	0:34	72.80%
Networking	2:45	1:10	57.58%
Configuring OS & firmware	8:01	3:45	53.22%
Configuring storage	3:34	1:45	50.93%
Total time spent deploying the Dell EMC solution	33:11	11:14	66.15%

Day-by-day breakdown: ProDeploy vs. an in-house administrator

MONDAY

1

The table below shows how our in-house administrator and the Dell EMC-certified engineer spent their time on the first day. Without ProDeploy, we spent the first five hours confirming implementation details with our project manager. It took the Dell EMC-certified engineer 20 fewer minutes to rack and cable the solution, configure the storage, upgrade the storage firmware, conduct a health check, and update the server firmware than it took us to plan the deployment and unbox and rack the PowerEdge servers, networking components, and storage arrays on the first day.

Stage	In-house administrator	ProDeploy
Planning	5:00	2:30
Unboxing and racking	2:46	1:30
Initial cabling		0:34
Configuring storage		0:31
Upgrading storage firmware		0:49
Checking server health		0:25
Updating server firmware		1:10
Time spent deploying the Dell EMC solution	7:46	7:29

TUESDAY

2

The table below shows how our administrator without ProDeploy and the Dell EMC-certified engineer spent their time on the second day. Our administrator had to address administrative and routine tasks that needed immediate attention. The Dell EMC-certified engineer, however, was able to focus and complete the deployment.

Stage	In-house administrator	ProDeploy
Planning	1:00	
Initial cabling	2:05	
Installing OS		0:15
Zoning Fibre Channel fabric		0:34
Configuring Ethernet switch	2:03	0:36
Setting up VMware vCenter®		1:15
Updating VMware ESXi™		
Installing OME and SAE		1:05
Time spent deploying the Dell EMC solution	5:08	3:45

WEDNESDAY

3

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

THURSDAY

4

FRIDAY

5

MONDAY

8

Stage	In-house administrator	ProDeploy
Wednesday		
Planning	1:00	
Checking server health	0:27	
Updating server firmware	1:03	
Installing OS	0:31	
Zoning Fibre Channel fabric	0:42	
Total time	3:43	0:00
Thursday		
Planning	5:00	
Configuring storage	0:31	
Total time	5:31	0:00
Friday		
Planning	2:00	
Configuring storage	0:34	
Upgrading storage firmware	2:02	
Total time	4:36	0:00
Monday		
Setting up vCenter	0:58	
Updating ESXi	3:58	
Installing OME and SAE	1:31	
Time spent deploying the Dell EMC solution	6:27	0:00

Get additional post-deployment care from Dell EMC

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



Conclusion

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

- Installing and configuring a Dell EMC solution with ProDeploy reduced our in-house administrator's involvement with the project by 92 percent.
- The Dell EMC-certified engineer needed only about 11 hours over two business days to deploy our Dell EMC solution.
- Without ProDeploy, it took more than 33 hours over six business days for our in-house administrator to install and configure the same solution.
- The Dell EMC-certified engineer installed and configured the Dell EMC solution 195 percent faster, saving 21 hours and 57 minutes and allowing our in-house administrator to focus on organizational demands and other strategic initiatives.
- Familiarity with the solution components allowed the Dell EMC-certified engineer to complete tasks, such as configuring the network, faster than our in-house administrator, 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.

On October 2, 2017, we reset the Dell EMC environment to its original state in preparation for the Dell EMC-certified engineer to arrive on-site and begin the deployment. We had already completed our in-house deployment of the solution and finalized the hardware and software configurations. The Dell EMC-certified engineer completed deployment on October 5, 2017. 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. The configurations below were current for our testing period.

Appendix A: System configuration information

Servers

Server configuration information	4 x Dell EMC PowerEdge R730
BIOS name and version	Dell EMC 2.5.5
Non-default BIOS settings	N/A
Operating system name and version/build number	ESXi 6.5
Date of last OS updates/patches applied	10/04/2017
Power management policy	Default
Processor	
Number of processors	2
Vendor and model	Intel® Xeon® E5-2630 v4
Core count (per processor)	10
Core frequency (GHz)	2.2
Stepping	M0
Memory module(s)	
Total memory in system (GB)	384
Number of memory modules	24
Vendor and model	Hynix HMA82GR7MFR8N-UH
Size (GB)	16
Type	PC4-17000
Speed (MHz)	2,400
Speed running in the server (MHz)	1,866
Storage controller	
Vendor and model	Dell EMC PERC H730P Mini
Cache size (GB)	1
Firmware version	25.3.3.0005
Driver version	6.606.12.00-1OEM

Server configuration information		4 x Dell EMC PowerEdge R730		
Local storage				
Number of drives	4			
Drive vendor and model	Seagate ST300MP0026			
Drive size (GB)	300			
Drive information (speed, interface, type)	15K, 12Gbps SAS, 2.5" HDD			
Network adapters	Network adapter A	Network adapter B	Network adapter C	
Vendor and model	QLogic 57810	QLogic 57810	Mellanox ConnectX-3 QSFP+	
Number and type of ports	2 x 10GbE	2 x 10GbE	2 x 40GbE	
Driver version	7.14.13	7.14.13	15.11.40	
Cooling fans				
Vendor and model	Delta Electronics PFR0612DHE-SP00			
Number of cooling fans	6			
Power supplies				
Vendor and model	Dell EMC 1100W, RDNT, LTON			
Number of power supplies	2			
Wattage of each (W)	1100			

Storage

Storage		Dell EMC Storage SC9000 array controllers and SC420 storage tray	
Storage controllers			
Controller firmware version	R07.01.04.004.01		
Number of controllers	2		
Number of shelves	1		
Network ports	2 x 16Gb Fibre Channel, 4 x 10Gb Ethernet		
RAID configuration	RAID10		
Drives	Drive model B	Drive model B	
Drive vendor and model number	Dell EMC Enterprise Plus 0B32190	Dell EMC Enterprise Plus 0B32293	
Drive size (TB)	1.6	1.92	
Drive information (speed, interfaces, type)	12 Gbps, SAS, SSD	12 Gbps, SAS, SSD	

Appendix B: How we tested

Configuring the networking components

Configuring the Dell EMC S4048-ON switches

We configured the two Dell EMC S4048-ON switches to house the intra-VM and iSCSI traffic in the testing environment by performing the following general guidelines:

1. Enable stacking between the two switches.
2. Configure the management IPs, DNS, and NTP IP addresses.
3. Configure the VLANs for iSCSI, vMotion, and VM traffic.

For a full printout of the running configuration of our switches, see [Appendix A](#).

Configuring the Brocade 6510 fabric switches

We configured the two Brocade fabric switches for fibre channel communication between the servers and the storage by performing the following steps:

1. Assign management IP, DNS, and NTP IP addresses.
2. Configure the fibre channel zones to allow communication between the hosts and the storage.

Configuring the Dell EMC Storage SC9000 and SC420

We configured the storage to communicate with the Dell EMC servers as follows:

1. Open Dell EMC Storage Manager Client.
2. In Dell EMC Storage Manager Client, enter the IP address of the system you are trying to configure, along with the username and password.
3. When prompted, change the password from the default to a new password.
4. At the new screen, click Launch Initial Configuration.
5. In Introduction, click Next.
6. In Submit License File, add your license file, and click Next.
7. In Create Disk Folder, accept defaults, and click Next.
8. In Create Storage Type for Assigned, accept defaults, and click Next.
9. In Add Controller, enter the IP address for your second controller, and click Next.
10. In Set System Information, enter your management IP address, select Generate a new self-signed certificate for the Storage Center, and click Next.
11. In Key Management Server, click Skip.
12. In Configure Fault Tolerance, ensure "Configure Fault Domains" is selected, and click Next.
13. Select Virtual Port and 1 Fault Domain, and click Next.
14. Select both ports in Fault Domain 1, and click Next.
15. In iSCSI ports, select 2 Fault Domains, and click Next.
16. Select your IPs for Fault Domain 1, and click Next.
17. Select your IPs for Fault Domain 2, and click Next.
18. Review the settings, and click Next.
19. In Configure Back-End Ports, select the ports you intend to use for connecting to your disks, and click Next.
20. In Time Settings, select your region and NTP server, and click Next.
21. In SMTP Server Settings, uncheck all boxes, and click Next to bypass configuration.
22. In SupportAssist System State Information Collection and Storage, check By checking this box, you accept the above terms, and click Next.
23. In Provide Contact Information, enter your contact information, and click Next.
24. In the Configuration Complete screen, click Finish.

Configuring the Dell EMC servers

Installing ESXi on the servers

1. Insert the VMware vSphere® installation media, and power on the server, choosing to boot from the DVD drive.
2. Select the standard vSphere installer and allow the files to copy into memory.
3. At the welcome screen, press F11.
4. At the keyboard language selection screen, press Enter.

5. Enter a password twice for the root user, and press Enter.
6. Choose to install to the Dell EMC Internal Dual SD Cards.
7. Allow the installer to finish installing vSphere, and reboot the server.
8. At the home screen, press F2, and enter your credentials.
9. Select Configure Management Network.
10. Select IP Configuration.
11. Enter your static IP information, and press Enter.
12. Select DNS Configuration.
13. Enter a hostname, and press Enter.
14. To restart the management network, press Esc, and press Y.

Deploying the vCenter service appliance

1. Mount the image, navigate to the vcsa folder, and launch the VMware Client Integration Plugin executable.
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 the install button.
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 datacenter, 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.

Adding the servers to the vCenter

1. Log into your vCenter.
2. In the left pane, right-click on the vCenter, and select New Datacenter.
3. Enter the name of your datacenter, and press OK.
4. Right-click on 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, enter the username and password to log into your ESXi host, 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.

Appendix C – Testing results

The times in the table below are in hours and minutes.

Stage	In-house administrator	ProDeploy
Planning	14:00	2:30
Unboxing and racking	2:46	1:30
Initial cabling	2:05	0:34
Configuring storage	1:05	0:31
Upgrading storage firmware	2:02	0:49
Checking server health	0:27	0:25
Updating server firmware	1:03	1:10
Installing OS	0:31	0:15
Zoning Fibre Channel fabric	0:42	0:34
Configuring Ethernet switch	2:03	0:36
Setting up vCenter	0:58	1:15
Updating ESXi	3:58	
Installing OME and SAE	1:31	1:05
Total time spent deploying the Dell EMC solution	33:11	11:14

This project was commissioned by Dell Technologies.



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