



Streamline Your Server Deployments by Choosing Dell EMC™ PowerEdge™ Servers with Preinstalled Microsoft® Software

Our tests demonstrate the value of deploying a Dell EMC PowerEdge server with Windows Server® 2019 preinstalled.

Working in IT for a small- or medium-sized business (SMB) is no cakewalk. In these organizations, all computing responsibilities, such as help-desk duties and routine software installations, typically fall to a miniscule staff that might even comprise just one person. The tech heroes who support these SMBs are generalists by necessity, spending their days fighting many types of IT support battles. But to implement new solutions within their tight time and budget constraints can be a challenge, especially when doing so requires special expertise beyond what they need to perform their day-to-day responsibilities.

To mention a timely example, Microsoft is ending support for Windows Server® 2008 and Windows Server 2008 R2 in January 2020. IT professionals understand all too well the inherent dangers of running an unsupported platform. However, purchasing and deploying new servers can be time-consuming and expensive for SMBs. To complicate matters further, it's no easy task to acquire the technical proficiency needed to provide high-quality support across the hardware and software stack after deployment.

Prowess Consulting set out to discover a way to ease the burden of deploying servers for time- and cash-strapped IT personnel. And through our testing and research, Prowess Consulting can confirm that there is a simpler, faster, and less expensive alternative to help IT generalists deploy and support new servers. That option is to purchase Dell EMC™ PowerEdge™ servers preinstalled with Windows Server 2019 software, discounted through special original equipment manufacturer (OEM) licensing. When bundled in this way, with Windows Server 2019 at a reduced price, PowerEdge servers “just work” right out of the box, saving time and effort, in addition to money. What's more, these servers are eligible for Dell ProSupport™ IT-management services that support the entire solution—both hardware and software—after deployment.

Faster, less-expensive, simpler, and with better support.



Figure 1. Dell EMC™ PowerEdge™ servers with Windows Server® 2019 preinstalled offer a wide range of benefits

OEM Licensing Speeds Time to Value

Prowess compared the time required to deploy a PowerEdge R740xd server on which an OEM-licensed version of Windows Server 2019 had been preinstalled with the time needed to deploy a PowerEdge R740xd server on which a volume-licensed version of Windows Server 2019 had to be installed manually. Our results are shown in Figure 2. Deploying the server with Windows Server 2019 preinstalled saved us almost 27 minutes, which amounted to 86 percent less time spent on deployment compared to the alternative. And not only was deployment faster with the OEM software preinstalled, but it was also much easier. It typically takes 46 steps to manually deploy a PowerEdge R740xd server with a volume license of Windows Server 2019. In contrast, our team was able to deploy the same server with Windows Server 2019 OEM licensing in just six steps. Finally, beyond this advantage of speed, the server with OEM licensing gives you a clean, consistent installation of the operating system that reduces the possibility of human error.

Save time and effort through OEM software on Dell EMC™ PowerEdge™ servers

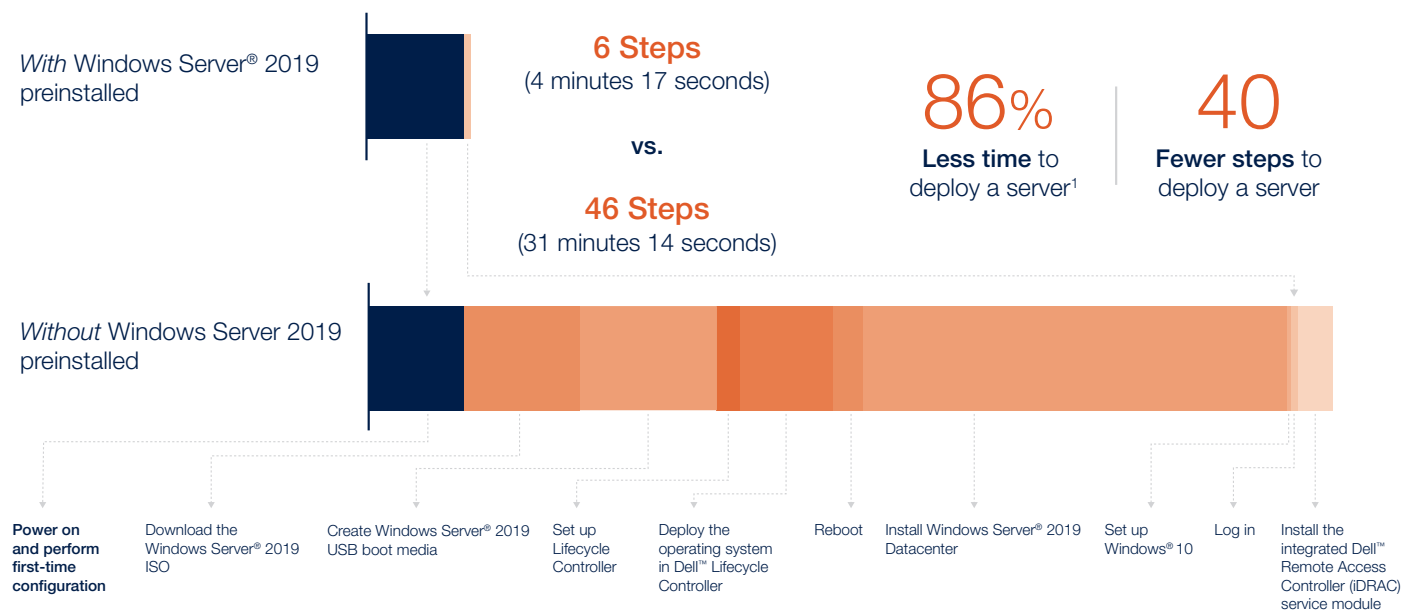


Figure 2. Deploying a Dell EMC™ PowerEdge™ server is dramatically faster and simpler when it comes with Windows Server® 2019 preinstalled¹

Table 1 shows how these time savings accumulate when a company deploys one, 10, 50, or 100 servers. In the latter case, the cumulative time savings amount to more than 31 hours. But even if you are not deploying dozens of servers, the preinstalled software lets IT teams of various sizes deploy servers faster, with fewer steps, and in a much more consistent way—that is, with a lower risk for human error.

Table 1. Total time saved by choosing OEM licensing for one, 10, 50, and 100 servers¹

Deploying Dell EMC™ PowerEdge™ R740xd with Preinstalled OEM Software (Compared to Deploying the Same System without Preinstalled OEM Software)

Scale	Time Saved	Steps Saved
1 server	26m 57s	40
10 servers	3h 15m 33s	256
50 servers	15h 44m 53s	1,216
100 servers	31h 21m 33s	2,416

NOTE

The values in Table 1 include extra time and steps needed to create installation media only for the deployment of the first server with volume licensing. Subsequent servers are assumed to use available installation media.

To illustrate the practical value of this time saved, imagine two network administrators, Nestor and Maria. Both admins work at companies with approximately 150 employees, and they both are tasked with deploying 10 servers that will be used to support a new revenue-generating application for the company. Their different experiences are summarized below.

Nestor



Deploys 10 Dell EMC™ PowerEdge™ R740xd Servers without Preinstalled Software

- Loses time obtaining licenses, downloading software, and creating installation media.
- Deployment takes nearly four hours.³
- Spends extra time ensuring that no errors were made during the installations.

Maria



Deploys 10 PowerEdge R740xd Servers with Preinstalled Software

- Saves time and starts deployment right away.
- Deployment completed in less than 43 minutes.⁴
- Reduces possibility for human error during Windows Server® 2019 installation.



OEM Licensing Saves Money

Dell EMC PowerEdge servers pre-bundled with Windows Server 2019 OEM licenses can save companies a significant amount of money per server, providing financial relief and reducing risk for small businesses with constrained budgets. Prowess compared the explicit costs of licenses on Dell EMC PowerEdge R740xd servers for Windows Server 2019 Standard, shown in Figure 3, and for Windows Server 2019 Datacenter, shown in Figure 4.

As shown in Figure 3, OEM licensing saves more than \$206 US dollars (USD), or 21 percent, per server for the cost of Windows Server 2019 Standard on a Dell EMC PowerEdge R740xd.⁵

For Windows Server 2019 Datacenter, the cost savings are even more dramatic. As shown in Figure 4, OEM licensing saves more than \$1,926 USD (or 31 percent) per server for the cost of Windows Server 2019 Datacenter on a Dell EMC PowerEdge R740xd.²

Licensing cost of Windows Server® 2019 Standard on a Dell EMC™ PowerEdge™ R740xd server

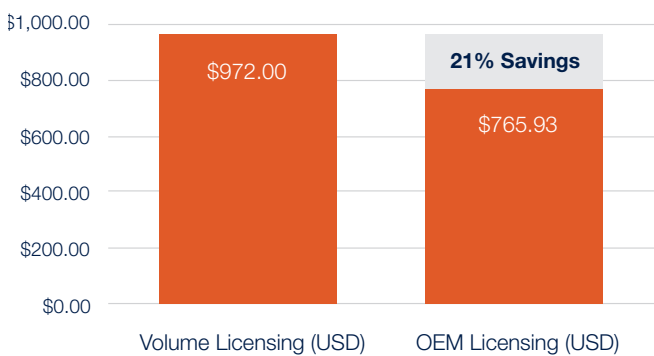


Figure 3. OEM licensing for Windows Server® 2019 Standard saves \$206.07 USD (or 21 percent) for each Dell EMC™ PowerEdge™ R740xd server⁵

Licensing cost of Windows Server® 2019 Datacenter on a Dell EMC™ PowerEdge™ R740xd server

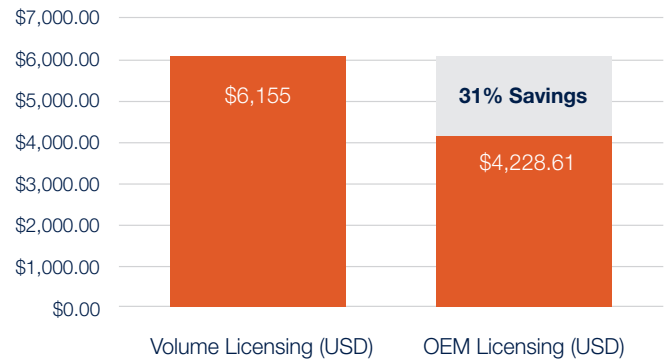


Figure 4. OEM licensing for Windows Server® 2019 Datacenter saves \$1,926.39 USD (or 31 percent) for each Dell EMC™ PowerEdge™ R740xd server²

In addition, if a company were to deploy 100 Dell EMC PowerEdge R740xd servers in a given year, the cumulative personnel time savings of more than 31 hours, as shown in Table 1, would amount to a savings of more than \$1,000 USD in labor costs alone, based on an average network administrator salary of nearly \$70,000 USD per year.⁶

Now let's compare how these different prices might affect Nestor and Maria, the network administrators who chose different options for Windows Server 2019 licensing.

Nestor



**Purchases 10 Dell EMC™
PowerEdge™ R740xd Servers
without Preinstalled Software**

- Purchases volume licenses for Windows Server® 2019.
- Spends more than \$60,000 USD on licensing, and extra on labor costs due to time required to handle license procurement and server deployment.⁷
- Wastes time on less-valuable tasks that do not advance the company's strategic goals.

Maria



**Purchases 10 PowerEdge
R740xd Servers
with Preinstalled Software**

- Purchases OEM licenses through Dell Technologies.
- Saves more than \$19,000 USD on licensing. Spends minimal time on procurement and deployment.⁸
- Focuses on tasks that are more valuable to the company.

OEM Licensing Simplifies Tech Support

The time and cost savings that result from OEM licensing of Windows Server 2019 on Dell EMC PowerEdge servers are significant, but the consolidated tech support that is available for PowerEdge servers might be even more beneficial. And that's because Dell ProSupport IT-management services offer a single point of support for the server hardware and software.

The advantages of this consolidated hardware and software tech support are enormous for small IT teams. Let's return once more to Nestor and Maria to see how the tech support available with their solutions has an impact on their jobs.

Nestor



**Deploys Dell EMC™
PowerEdge™ Servers
without Dell ProSupport™
IT-Management Services**

- Spends hours determining if issues are hardware- or software-based.
- Gets frustrated as hardware and software vendors point fingers.
- Receives conflicting diagnoses. Jumps between vendors. Eventually finds a workaround online.

Maria



**Deploys PowerEdge Servers
with Dell ProSupport
IT-Management Services**

- Contacts Dell ProSupport for any issues.
- Receives complete support from the Dell Technologies team.
- Feels relief as the issue is resolved with minimal downtime.

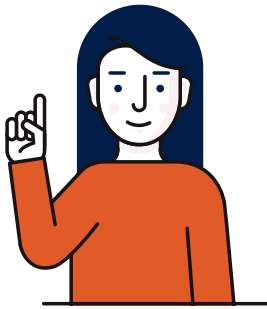
Figure 5 illustrates the advantages of unified tech support for hardware and software.

A single source for support saves time and effort



Figure 5. Unified hardware and software tech support provides a one-stop shop to resolve technical problems, and it helps prevent hardware and software vendors from sending customers back and forth for answers

Deploy Servers Fast, for Less Money



86%

Less time to
deploy a server¹

40

Fewer steps to
deploy a server¹

31%

Less-expensive
licensing²

1

Source for hardware
and software support

Like IT professionals in small- to mid-sized businesses across the world, you face difficult challenges every day to keep your company infrastructure running at its peak and keep your users at their most productive. The last thing you have time for is a server deployment that could take hours and could lead to support problems in the future. You can avoid these risks while saving both time and money by deploying a Dell EMC PowerEdge server with Windows Server 2019 preinstalled.

Choosing Windows Server 2019 OEM licensing for PowerEdge servers provides the following advantages:

- **86 percent less time** and **40 fewer steps** to deploy each server¹
- Up to **31 percent lower costs** for Windows Server 2019 licensing per server²
- **A single point of support for hardware and software** available through Dell ProSupport IT-management services

For SMBs, Dell EMC PowerEdge servers work better as an overall solution when bundled with Windows Server 2019 and OEM licensing. Through our testing and research, we found that this server configuration option lowers costs while easing the burden of server deployments for overworked IT personnel.

For more information about the configurations available for Dell EMC PowerEdge servers, see [PowerEdge servers website](#).

Appendix

This document describes the configuration information of the systems we tested, the procedures we tested, and our test results. We completed our testing on November 21, 2019.

System Configuration Information

The table below provides details about the system on which we performed our testing.

Server Configuration Information	
BIOS name and version	Dell™ 2.3.10
Non-default BIOS settings	Not applicable (N/A)
Operating system name and version	Windows Server® 2019 Datacenter 2019 version: 1809 build: 17763.107
Date of last operating system update/patches applied	10/9/2019
Power-management policy	Performance
Processor	
Number of processors	2
Vendor and model	Intel® Xeon® Gold 5217 processor
Core count (per processor)	8
Core frequency	3.00 GHz
Stepping	L1
Memory Modules	
Total memory in system (GB)	256
Number of memory modules	8
Vendor and model	Hynix® HMA84GR7JJR4N-WM
Size (GB)	32
Type	PC4-2933Y
Speed	2,600
Storage Controller	
Vendor and model	Dell PERC H740P
Cache size (GB)	N/A
Firmware version	50.5.1-2818, A07.1
Driver version	7.705.13.00, A00
Storage Controller 2	
Vendor and model	Dell BOSS-S1
Cache size (GB)	N/A
Firmware version	2.5.13.3020, A05
Driver version	1.2.0.1048, A00
Local Storage	
Drive vendor and model	Dell 400-AZVM
Number of drives	8
Drive size	960 GB
Drive information (speed, interface, type)	6 GB/s, SATA, SSD
Network Adapter	
Vendor and model	Broadcom® 57416 dual-port 10 GbE BASE-T + 5720 dual-port 1 GbE BASE-T
Number and type of ports	2 x 1 GbE, 2 x 10 GbE
Driver version	21.40.2, 21.40.17.70

Cooling Fans	
Vendor and model	Sunon® VF60381B1
Number of cooling fans	6
Power Supplies	
Vendor and model	Dell 450-ADWS
Number of power supplies	2
Wattage of each (W)	750

Test Procedures

This section shows all of the procedures we performed in our testing.

Deploy the Dell EMC PowerEdge R740xd with Preinstalled Windows Server 2019

Configure the system:

1. Power on the system.
2. Accept the default home country/region, language, and keyboard layout, and then click **Next**.
3. Accept the User Agreement.
4. Enter a password for the administrator account, and then click **Finish**.
5. Choose the default 60 GB operating system partition, and then click **OK**.
6. Log on to Windows®.

When the Server Manager appears, setup is complete.

Deploy the Dell EMC PowerEdge R740xd without Preinstalled Software

Download the Windows Server 2019 evaluation ISO file:

1. Open a web browser.
2. Search for **Windows Server 2019**.
3. Select **Windows Server 2019**.
4. Select **Try Now**.
5. Select **Download Free Trial**.
6. Select **ISO**, and then click **Continue**.
7. Fill out the information form, and then click **Continue**.
8. Select the appropriate language.
9. Click **Download**.

Create Windows Server 2019 USB Boot Media

For purposes of the deployment, Rufus® 3.1 was used to create the bootable USB.

1. Go to **Start**.
2. Search for **Rufus**.
3. Launch Rufus.
4. Select the USB device.
5. Next to **Boot Select**, click **Select**.
6. Browse and select the Windows Server 2019 ISO, and then click **Open**.
7. Click **Start**.

Set up Dell™ Lifecycle Controller

1. Power on the system.
2. During boot, select the boot option for Dell Lifecycle Controller.
3. Select the default options in the Lifecycle Initial Setup Wizard, and then click **Next**.
4. Click **Next**.
5. On the **Network Settings** screen, keep **DHCP** selected or select the option for **Configure for Static IP**, and then make sure the correct NIC is selected. Click **Next**.

Deploy Windows Server 2019

1. Our testing assumed that the RAID was preconfigured in the factory prior to shipping.
2. In Dell Lifecycle Controller, select **OS Deployment**.
3. Click **Deploy OS**.
4. Select **Go Directly to OS Deployment**, and then click **Next**.
5. On step 2 of 5, leave **Boot mode** set to **UEFI**, **Secure Boot** set to **Disabled**, and **Secure Boot Policy** set to **Standard**. Under **Available Operating Systems**, select **Windows Server 2019**, and then click **Next**.
6. On step 3 of 5, keep defaults and click **Next**.
7. On step 4 of 5, keep defaults and click **Next**.
8. On step 5 of 5, keep defaults and click **Finish**.
9. The system boots automatically from the USB drive.
10. Click **Next** to enter Windows setup.

Install Windows Server 2019 Datacenter

1. At the **Windows Setup** window, click **Next**.
2. Click **Install Now**.
3. Enter the Windows product key, and then click **Next**.
4. Click **Windows Server 2019 Datacenter (Desktop Experience)**, and then click **Next**.
5. Click **I accept the license terms**, and then click **Next**.
6. Click **Custom: Install Windows only (advanced)**.
7. Select the correct volume, and then click **Next**.

Set up Windows®

1. After a couple of reboots, at the **Customize settings** screen, enter and confirm the password, and then click **Finish**.
2. Log on to Windows with the newly created password.

Install the iDRAC Service Module

1. Navigate to www.dell.com/support/article/us/en/19/sln310557/dell-emc-idrac-service-module?lang=en, scroll down to **Links**, and then click the hyperlink.
2. Enter the service tag for the server.
3. Scroll to find **Dell EMC iDRAC Service Module for Windows**.
4. Click **Download**.
5. Click **Run**.
6. Click **Install**.
7. On the installation screen asking “**Would you like to install this package,**” click **Yes**.
8. On the success screen, click **OK**.

Our Results

The following table shows the results of our testing.

	Without preinstalled OEM software and using Lifecycle Controller		With preinstalled OEM software	
	Time	Steps	Time	Steps
Power on and first-time configuration	0:03:03	1	0:04:02	5
Download the Windows Server® 2019 ISO	0:03:46	9	N/A	N/A
Create Windows Server 2019 USB Boot media	0:04:27	7	N/A	N/A
Set up the Lifecycle Controller	0:00:45	4	N/A	N/A
Deploy the operating system in Lifecycle Controller	0:02:58	8	N/A	N/A
Reboot	0:01:00	0	N/A	N/A
Install Windows Server 2019 Datacenter	0:13:45	8	N/A	N/A
Set up Windows	0:00:08	2	N/A	N/A
Log in	0:00:15	1	0:00:15	1
Install the iDRAC Service Module	0:01:07	6	N/A	N/A
Total	0:31:14	46	0:04:17	6



Windows Server 2019



¹ “86 percent faster” and “40 fewer steps” findings are based on choosing a Dell EMC™ PowerEdge™ server with preinstalled Windows Server® 2019 compared to installing the software manually, according to testing performed by Prowess Consulting on November 21, 2019. For details on the configurations, procedures, and results, see the [Appendix](#). Actual deployment times may vary depending on configurations and procedures.

² “31 percent less expensive” finding is based on the price for the volume-licensed version of Windows Server® 2019 Datacenter published at www.microsoft.com/en-us/cloud-platform/windows-server-pricing on December 3, 2019, in addition to the price for the OEM-licensed version of Windows Server 2019 Datacenter for a Dell EMC™ PowerEdge™ R740xd server, published at www.dell.com/en-us/work/shop/cty/pdp/spd/poweredge-r740xd/pe_r740xd_12238_vi_vp on December 3, 2019. Licensing costs for preinstalled software will depend on your choice of software edition, processor, and date of purchase, so savings can vary.

³ Based on the time required to deploy a Dell EMC™ PowerEdge™ R740xd server without Windows Server® 2019 preinstalled, according to testing performed by Prowess Consulting on November 21, 2019. For details on the configurations, procedures, and results, see the [Appendix](#). Actual deployment times may vary depending on configurations and procedures.

⁴ Based on the time required to deploy a Dell EMC™ PowerEdge™ R740xd server with Windows Server® 2019 preinstalled, according to testing performed by Prowess Consulting on November 21, 2019. For details on the configurations, procedures, and results, see the [Appendix](#). Actual deployment times may vary depending on configurations and procedures.

⁵ “21 percent less expensive” finding is based on the price for the volume-licensed version of Windows Server® 2019 Standard published at www.microsoft.com/en-us/cloud-platform/windows-server-pricing on December 3, 2019, in addition to the price for the OEM-licensed version of Windows Server 2019 Standard for a Dell EMC™ PowerEdge™ R740xd server, published at www.dell.com/en-us/work/shop/cty/pdp/spd/poweredge-r740xd/pe_r740xd_12238_vi_vp on December 3, 2019. Licensing costs for preinstalled software will depend on your choice of software edition, processor, and date of purchase, so savings can vary.

⁶ Glassdoor. “Network Administrator Salaries.” December 2019. www.glassdoor.com/Salaries/network-administrator-salary-SRCH_KO0,21.htm.

⁷ Based on the price for the volume-licensed version of Windows Server® 2019 Datacenter published at www.microsoft.com/en-us/cloud-platform/windows-server-pricing on December 3, 2019.

⁸ Based on the price for the OEM-licensed version of Windows Server® 2019 Datacenter published at www.dell.com/en-us/work/shop/cty/pdp/spd/poweredge-r740xd/pe_r740xd_12238_vi_vp on December 3, 2019.



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