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.

86% Faster to deploy a server
40 Fewer steps to deploy a server
31% Less-expensive licensing
1 Source for hardware and software 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

![Diagram showing steps comparison between preinstalled and non-preinstalled software](image)

Figure 2. Deploying a Dell EMC™ PowerEdge™ server is dramatically faster and simpler when it comes with Windows Server® 2019 preinstalled 1

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 servers.1

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

<table>
<thead>
<tr>
<th>Scale</th>
<th>Time Saved</th>
<th>Steps Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 server</td>
<td>26m 57s</td>
<td>40</td>
</tr>
<tr>
<td>10 servers</td>
<td>3h 15m 33s</td>
<td>256</td>
</tr>
<tr>
<td>50 servers</td>
<td>15h 44m 53s</td>
<td>1,216</td>
</tr>
<tr>
<td>100 servers</td>
<td>31h 21m 33s</td>
<td>2,416</td>
</tr>
</tbody>
</table>

**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
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.

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.

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.
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**

- 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 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.
A single source for support saves time and effort

**Time Lost**

**Without** Dell ProSupport™ IT-management services

Self-troubleshooting

Call to hardware vendor

Call to software vendor

No resolution

**Time Saved**

**With** Dell ProSupport IT-management services

Call to Dell Technologies support team

Problem resolved

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% 40 31% 1
Less time to deploy a server1 Fewer steps to deploy a server1 Less-expensive licensing2 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.

<table>
<thead>
<tr>
<th>Server Configuration Information</th>
<th>Dell EMC™ PowerEdge™ R740</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS name and version</td>
<td>Dell 2.3.10</td>
</tr>
<tr>
<td>Non-default BIOS settings</td>
<td>Not applicable (N/A)</td>
</tr>
<tr>
<td>Date of last operating system update/patches applied</td>
<td>10/9/2019</td>
</tr>
<tr>
<td>Power-management policy</td>
<td>Performance</td>
</tr>
</tbody>
</table>

**Processor**

<table>
<thead>
<tr>
<th>Number of processors</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor and model</td>
<td>Intel® Xeon® Gold 5217 processor</td>
</tr>
<tr>
<td>Core count (per processor)</td>
<td>8</td>
</tr>
<tr>
<td>Core frequency</td>
<td>3.00 GHz</td>
</tr>
</tbody>
</table>

**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**

<table>
<thead>
<tr>
<th>Vendor and model</th>
<th>Dell PERC H740P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cache size (GB)</td>
<td>N/A</td>
</tr>
<tr>
<td>Firmware version</td>
<td>50.5.1-2818, A07.1</td>
</tr>
<tr>
<td>Driver version</td>
<td>7.705.13.00, A00</td>
</tr>
</tbody>
</table>

**Storage Controller 2**

<table>
<thead>
<tr>
<th>Vendor and model</th>
<th>Dell BOSS-S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cache size (GB)</td>
<td>N/A</td>
</tr>
<tr>
<td>Firmware version</td>
<td>2.5.13.3020, A05</td>
</tr>
<tr>
<td>Driver version</td>
<td>1.2.0.1048, A00</td>
</tr>
</tbody>
</table>

**Local Storage**

<table>
<thead>
<tr>
<th>Drive vendor and model</th>
<th>Dell 400-AZVM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of drives</td>
<td>8</td>
</tr>
<tr>
<td>Drive size</td>
<td>960 GB</td>
</tr>
<tr>
<td>Drive information (speed, interface, type)</td>
<td>6 GB/s, SATA, SSD</td>
</tr>
</tbody>
</table>

**Network Adapter**

<table>
<thead>
<tr>
<th>Vendor and model</th>
<th>Broadcom® 57416 dual-port 10 GbE BASE-T + 5720 dual-port 1 GbE BASE-T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number and type of ports</td>
<td>2 x 1 GbE, 2 x 10 GbE</td>
</tr>
<tr>
<td>Driver version</td>
<td>21.40.2, 21.40.17.70</td>
</tr>
</tbody>
</table>
### Cooling Fans

<table>
<thead>
<tr>
<th>Vendor and model</th>
<th>Sunon® VF60381B1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of cooling fans</td>
<td>6</td>
</tr>
</tbody>
</table>

### Power Supplies

<table>
<thead>
<tr>
<th>Vendor and model</th>
<th>Dell 450-ADWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of power supplies</td>
<td>2</td>
</tr>
<tr>
<td>Wattage of each (W)</td>
<td>750</td>
</tr>
</tbody>
</table>

## 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.

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.
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.
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.
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

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.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Time</th>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power on and first-time configuration</td>
<td>0:03:03</td>
<td>1</td>
</tr>
<tr>
<td>Download the Windows Server® 2019 ISO</td>
<td>0:03:46</td>
<td>9</td>
</tr>
<tr>
<td>Create Windows Server 2019 USB Boot media</td>
<td>0:04:27</td>
<td>7</td>
</tr>
<tr>
<td>Set up the Lifecycle Controller</td>
<td>0:00:45</td>
<td>4</td>
</tr>
<tr>
<td>Deploy the operating system in Lifecycle Controller</td>
<td>0:02:58</td>
<td>8</td>
</tr>
<tr>
<td>Reboot</td>
<td>0:01:00</td>
<td>0</td>
</tr>
<tr>
<td>Install Windows Server 2019 Datacenter</td>
<td>0:13:45</td>
<td>8</td>
</tr>
<tr>
<td>Set up Windows</td>
<td>0:00:08</td>
<td>2</td>
</tr>
<tr>
<td>Log in</td>
<td>0:00:15</td>
<td>1</td>
</tr>
<tr>
<td>Install the iDRAC Service Module</td>
<td>0:01:07</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>0:31:14</td>
<td>46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Steps</th>
<th>Time</th>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>With preinstalled OEM software</td>
<td>0:04:02</td>
<td>5</td>
</tr>
<tr>
<td>and using Lifecycle Controller</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.


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.


The analysis in this document was done by Prowess Consulting and commissioned by Dell Technologies and Microsoft. Results have been simulated and are provided for informational purposes only. Any difference in system hardware or software design of configuration may affect actual performance.

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