

Testing the Value of Dell™ PowerEdge™ R750 Servers with Windows Server® 2022 Preinstalled

Prowess demonstrates the value of Dell PowerEdge R750 servers with Windows Server 2022 preinstalled.

Research Report

Executive Summary

Windows Server® 2022 is now generally available. For organizations that need stronger security postures, this is good news. Windows Server 2022 offers multi-layer security: certified secured-core hardware from OEM partners, a hardware root-of-trust, firmware protection, and more.

But migrating to Windows Server 2022 to gain valuable security features might seem like a daunting task. Where can IT departments find the time and budget to migrate after budget cuts and staff optimizations?

Windows Server® 2022 security highlights

 <p>Secured-core server</p>	 <p>Hardware root of trust</p>	 <p>Firmware protection</p>
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To evaluate the fastest and most cost-effective ways for companies to deploy Windows Server 2022 on Dell™ PowerEdge™ R750 servers, Prowess Consulting compared two options. We deployed Windows Server 2022 by:

- Using preinstalled software obtained through OEM licensing
- Manually installing software obtained through a Windows® volume licensing purchase

Using preinstalled Windows Server 2022 software obtained through OEM licensing resulted in a faster, less expensive, and simpler deployment process. In addition, the OEM licensing process included a single source for technical support.

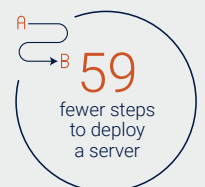
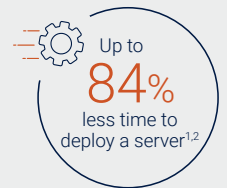
The Prowess Consulting testing and analysis demonstrated the following:

- Organizations can decrease Windows Server 2022 deployment time on a Dell PowerEdge R750 server by **up to 84 percent**—with **59 fewer steps**.^{1,2}
- Windows OEM licensing costs **up to 28 percent less** than Windows volume licensing.^{2,3}
- Organizations can obtain **a single source** for robust technical support, which can help save additional time and costs.

This white paper details the findings of the Prowess Consulting testing and analysis. Customers will benefit from reviewing the results as significant time and cost savings are available for Windows Server 2022 deployments through OEM licensing.

Windows Server® 2022 OEM licensing:

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



Increase Security with Windows Server 2022

Windows Server 2022 is now generally available; this is good news for organizations with pressing needs for stronger security postures. For example, 47 percent of small and medium-sized organizations surveyed by VIPRE report that keeping data secure is their largest security challenge.⁴ By migrating to Windows Server 2022, organizations can gain multi-layer security: certified secure-core hardware from OEM partners, a hardware root-of-trust, firmware protection, and more.

Research shows that small organizations are disproportionately the target of cyberattacks,⁵ so, while improving one’s security posture with Windows Server 2022 is a good investment for organizations of all sizes, it’s especially critical for small and medium-sized organizations. But migrating to Windows Server 2022 takes time and budget—both of which might be difficult to come by because many organizations typically run with lean IT staff. TechRepublic reports that more than half of its survey respondents (62 percent) said they will tighten their IT budgets because of the COVID-19 pandemic.⁶

Prowess Consulting researched how to optimize deployment of Windows Server 2022 on Dell PowerEdge R750 servers. Our tests revealed that organizations that use preinstalled Windows Server 2022 software through Windows OEM licensing can reduce server deployment time by up to 84 percent,^{1,2} compared to manually installing Windows Server 2022 with volume licensing. The result was more streamlined deployments, with 59 fewer process steps than manual installation of Windows Server 2022 using a volume license agreement.

Additionally, Prowess confirmed that Windows OEM licensing costs up to 28 percent less than Windows volume licensing for the same services and capabilities at the time of testing.^{2,3} Prowess also determined that technical support packaged with Windows OEM licenses could be a significant benefit for small to medium-sized organizations. This white paper outlines the test processes and the conclusions drawn from testing.

Faster Deployment Time with OEM Licensing

Prowess Consulting measured the time to get Windows Server 2022 installed on a Dell PowerEdge R750 server using two approaches:

- We procured a PowerEdge R750 server with Windows Server 2022 preinstalled through a Windows OEM licensing purchase.
- We manually installed Windows Server 2022 purchased with a Windows volume license. We installed the software onto a PowerEdge R750 server using Integrated Dell™ Remote Access Controller (iDRAC), a remote management tool that ships with PowerEdge servers.

Prowess Consulting measured a time savings of 30 minutes and 32 seconds per server when deploying Windows Server 2022 preinstalled through OEM licensing. This is 84 percent less time than manually installing Windows Server 2022 purchased with a volume license. It took 9 steps to deploy Windows Server 2022 on a PowerEdge R750 server using preinstalled software, and 68 steps to deploy Windows Server 2022 when manually installing software. See Table 1 for testing results.

Table 1. Prowess testing results: deployment time and deployment steps


Licensing Approach	Deployment Time	Number of Deployment Steps
Dell™ PowerEdge™ R750 server deployed with Windows Server® 2022 preinstalled through an OEM license purchase	6 minutes and 1 second	9 steps
Dell PowerEdge R750 server deployed by manually installing Windows Server 2022 through a Windows Server 2022 volume license purchase	36 minutes and 33 seconds	68 steps
Savings	30 minutes and 32 seconds	59 steps

Lean IT teams can save time and resources by deploying Windows Server 2022 on PowerEdge servers using preinstalled software with OEM licensing. Prowess recommends that organizations choose Windows Server 2022 OEM licensing when deploying Windows Server 2022.

To illustrate the practical value of our findings, we created some scenarios to illustrate how these results would affect two fictional IT admins, Arturo and Maya. Arturo and Maya both work at small companies with 150 employees. Both are tasked with deploying 10 servers to support a new application.

Arturo deploys 10 PowerEdge R750 servers *without* preinstalled software. He spends time obtaining licenses, downloading software, and creating installation media. Total deployment time is 6 hours, 5 minutes, and 30 seconds. (Ten servers deployed at 36 minutes and 33 seconds each.) He also spends time reviewing the installation to make sure no errors were made. In contrast, Maya deploys 10 PowerEdge R750 servers *with* preinstalled software. She does not need to procure licenses or download software, and she can begin deployment right away. She finishes in 1 hour and 10 seconds. (Ten servers at 6 minutes and 1 second each.) Her time savings of almost five hours enables her to move on to other tasks, increasing her productivity.


Arturo



Deploys 10 Dell™ PowerEdge™ R750 Servers without Preinstalled Software

- Loses time procuring licenses and downloading software.
- Deployment time takes just over six hours.
- Spends extra time checking that no errors were made during the manual installation.

Maya



Deploys 10 PowerEdge R750 Servers with Preinstalled Software

- Saves about five hours compared to Arturo.
- Deployment completed in about one hour.
- Eliminates human error with software preinstalled.

Lower Licensing Costs with OEM Licensing

Prowess Consulting compared the licensing costs of Windows Server 2022 Standard preinstalled through OEM licensing and Windows Server 2022 Standard purchased through volume licensing.

As shown in Figure 1, Windows Server 2022 OEM licensing saves more than \$300 USD, or 28 percent, per server for the cost of Windows Server 2022 Standard bundled with a Dell PowerEdge R750 server.^{2,3}

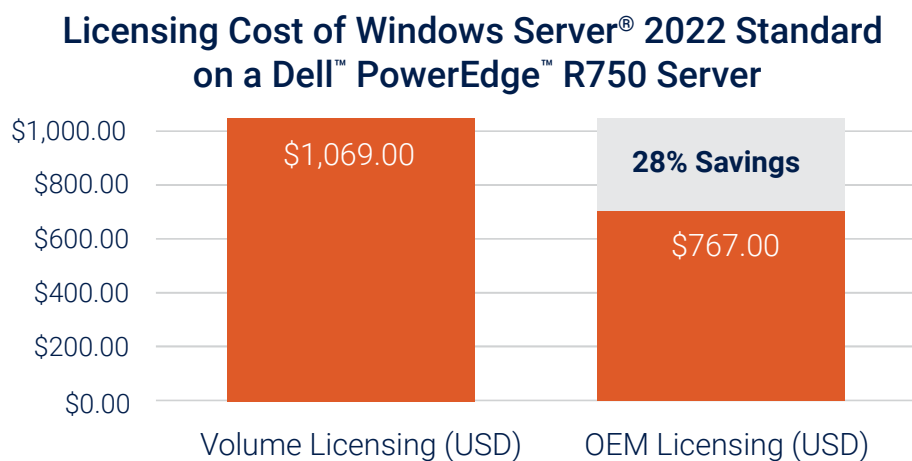


Figure 1. OEM licensing costs for Windows Server® 2022 Standard

Now, let's compare how these different prices might affect Arturo and Maya, the network administrators who chose different options for Windows Server 2022 licensing.

Arturo purchases 10 PowerEdge R750 servers *without* preinstalled software. He purchases volume licenses for Windows Server 2022, and his company spends approximately \$11,000 USD on licensing and Arturo's labor costs, assuming it costs his company \$75 USD/hour for Arturo to deploy 10 servers.^{7,8}

Maya purchases Windows Server 2022 OEM licenses through Dell Technologies when she purchases her servers. Her company spends approximately \$7,700 USD on licensing and Maya's labor costs to deploy 10 servers.⁹

Maya's company comes out ahead compared to Arturo's company, saving approximately \$3,300 USD on licensing and labor costs.

Arturo



Purchases 10 Dell™ PowerEdge™ R750 Servers without Preinstalled Software

- Purchases volume licenses for Windows Server® 2022.
- Spends approximately \$11,000 USD on licensing and labor for server deployment.^{7,8}
- Spends approximately 6 hours deploying 10 servers instead of focusing on other priority tasks.^{1,2}

Maya



Purchases 10 PowerEdge R750 Servers with Preinstalled Software

- Purchases OEM licenses through Dell Technologies.
- Spends approximately \$7,700 USD on licensing and labor to deploy 10 servers. Her company saves \$3,300 USD compared to Arturo's company.⁹
- Focuses on tasks that are more valuable to the company.

More Robust Technical Support

The deployment time and licensing cost savings that result from OEM licensing of Windows Server 2022 on PowerEdge R750 servers are significant. However, the consolidated technical support available for PowerEdge servers with Windows OEM licensing needs to be factored into an organization's decision making. This is because Dell ProSupport™ IT-management services offer a single point of support for the server hardware and software. This contrasts with the experience of IT admins purchasing Windows Server volume licensing, who would need to contact multiple hardware and software vendors to get help. Let's examine two real-world examples to determine how support costs impact the bottom line.

Arturo



Deploys Dell™ 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.

Maya



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.

Arturo deploys PowerEdge R750 servers *without* Dell ProSupport IT-management services. When an issue arises, he first spends hours determining if he has a hardware- or software-based issue. He works with multiple vendors and receives conflicting diagnoses. Eventually, he finds a workaround online.

Maya, meanwhile, deploys PowerEdge servers *with* Dell ProSupport IT-management services. As issues arise, she has one number to call for any support question. She gets her servers deployed on schedule and has free time for other tasks.

Deploy Servers Fast, at Lower Cost

Prowess Consulting testing and analysis demonstrates that companies deploying Windows Server 2022 on PowerEdge R750 servers can decrease deployment time by up to 84 percent—with 59 fewer steps—by choosing Windows OEM licensing, which provides preinstalled software.^{1,2} Windows OEM licensing also costs up to 28 percent less than Windows volume licensing.^{2,3} Lastly, by purchasing Windows OEM licensing, companies also obtain a single source for robust technical support, which can save additional time and costs.



For organizations of all sizes, the choice is obvious. To gain the security benefits of Windows Server 2022, quickly and cost-effectively, Prowess recommends Windows OEM licensing.

[Learn more about Microsoft OEM software from Dell Technologies.](#)

Appendix

This document describes the configuration information of the systems and procedures that Prowess Consulting tested. We completed our testing on September 14, 2021.

System Configuration Information

Server Configuration Information	Dell™ PowerEdge™ R750
BIOS name and version	Dell 1.3.8
Non-default BIOS settings	Not applicable (N/A)
Operating system name and version	Windows Server® 2022 version: 21H2 build: 20348.169
Date of last operating system update/ patches applied	08/10/2021
Power-management policy	Balanced
Processor	
Number of processors	2
Vendor and model	Intel® Xeon® Gold 6346 processor
Core count (per processor)	16
Core frequency	3.10 GHz
Stepping	D2
Memory Modules	
Total memory in system (GB)	256
Number of memory modules	16
Vendor and model	Hynix® HMA82GR7DJR8N-XN
Size (GB)	16
Type	PC4-25600
Speed	3,200 MHz
Storage Controller	
Vendor and model	Dell™ PowerEdge RAID Controller 11 (PERC 11) H7755
Cache size (GB)	N/A
Firmware version	52.16.1-4074
Driver version	7.716.3.0, A05
Local Storage	
Drive vendor and model	Dell HFS960G32FEH-BA10A
Number of drives	8
Drive size	960 GB
Drive information (speed, interface, type)	6 GB/s, Serial ATA (SATA®), solid-state drive (SSD)
Network Adapter	
Vendor and model	Broadcom® 5720 quad-port 1 gigabit Ethernet (GbE) BASE-T+ 57416, dual-port 10 GbE BASE-T
Number and type of ports	4 x 1 GbE, 2 x 10 GbE
Driver version	21.81.3, 21.85.21.91
Cooling Fans	
Vendor and model	AVC® DBPG0638B2UP027
Number of cooling fans	6
Power Supplies	
Vendor and model	Dell CYHHJ
Number of power supplies	2
Wattage of each (W)	1,400

Test Procedures

Deploy the Dell PowerEdge R750 Server with Preinstalled Windows Server 2022

1. Start up the system; the system will autoboot into Windows Server 2022 and will reboot once during Windows setup.
2. Click **Next**.
3. Click **Do this later**.
4. Click **Accept** on the license terms.
5. Fill out a password for the administrator account.
6. Click **Finish**.
7. Press **Ctrl+Alt+Delete** to unlock the system.
8. Enter a password for the administrator account, and then press **Enter**.
9. Wait for the server manager to open and finish initialization.

Deploy the Dell PowerEdge R750 Server without Preinstalled Software

Steps for iDRAC setup:

1. Power on the system, and then wait for the boot menu to appear at the top-left of the screen.
2. Press **F2** for system setup, and then wait for the **System Setup** menu to appear.
3. Click **iDRAC settings**, and then wait for the **iDRAC settings** menu to appear.
4. Click **System summary**, scroll down to **Current iDRAC Network Settings**, and then find the current IP address.
5. Click **Back**.
6. Click **Network**.
7. Scroll down to **IPV4 Settings**, and then change the setting for **Use DHCP to obtain DNS server addresses** to **Enabled**.
8. Click **Back**.
9. Scroll down and click **User Configuration**.
10. Change the username.
11. Click the **Password** field for **Change Password**, and then click **Enter**.
12. Type a new password, and then click **OK**.
13. Type the password again, and then click **OK**.
14. Click **Back**.
15. Click **Finish**, and then click **Yes** on the warning box that appears.
16. Click **Finish**, and then click **Yes** on the confirmation exit warning box that appears.

Steps for Windows Server 2022 installation:

1. On a separate work system that is connected to the same network as the server, download the Windows Server 2022 ISO.
2. Enter the iDRAC IP address into a web browser.
3. Enter a username and password, and then click **Log In**.
4. Click **Power on** under the **Dashboard** heading.
5. Click **Start the virtual console** under the virtual console heading in the bottom right, and then wait for the system to connect.
6. Wait for the boot menu to appear.
7. Press **F10** to enter the lifecycle controller, and then wait for the **Lifecycle controller** menu to appear.
8. Click **Next**.
9. Click **Next**.
10. Choose the network interface controller (NIC) that is connected to the network in the drop-down menu under **NIC Card**.
11. Click the drop-down menu beside **IP Address Source**, and then select **DHCP**.
12. Click **Next**, and then wait for the success box to appear.
13. Click **OK**.
14. Click **Finish**.
15. Click **Configure RAID and Deploy an Operating System**.
16. Click **Next**.
17. Click **OS** under **Virtual disk**.
18. Click **Next**.
19. Choose **RAID 1**.
20. Click **Next**.
21. Choose two drives under **Select Physical Pool**.
22. Click **Next**.
23. Fill in the virtual disk name.
24. Click **Next**.
25. Click **Finish**.
26. Click **Yes** on the **RAID configuration** warning screen that pops up, and then wait for the RAID configuration to finish.
27. Click **OK** on the **Success** screen.

28. Click **Next**, and then wait for the system to compose the OS drivers
29. Click **Next**.
30. Click **Virtual Media** at the top of the screen.
31. Click **Connect Virtual Media**.
32. Click **Choose File** in the **Map CD/DVD** section.
33. Browse to and select the Windows Server 2022 ISO, and then click **Open**.
34. Click **Map Device** in the **Map CD/DVD** section.
35. Click **Close**.
36. From the **Select media** drop-down menu, select **SSS_X64Free_en-US_D (Virtual CD)**.
37. Click **Next**.
38. Click **Yes** for the **OS Media Verification** warning dialog.
39. Click **Finish**, and then wait for the **Windows Server Setup** screen.
40. Select **Windows Server 2022 Datacenter Evaluation (Desktop Experience)**.
41. Click **Next**.
42. Select the check box to accept the **Microsoft Software License Terms**.
43. Click **Next**.
44. Click **Custom**.
45. Click **Next**, and then wait for the **Customize Settings** screen to appear.
46. Fill in the password fields.
47. Click **Finish**.
48. Click **Console Controls** at the top-right of the screen.
49. Click **Apply** beside **Ctrl+Alt+Delete**.
50. Click **Close**.
51. Enter your **Password**.
52. Press **Enter** after typing your password, and then wait for the **Server Manager** screen to appear and finish initializing.

Test Time

Deploy a Dell PowerEdge R750 Server Using Preinstalled Windows Server 2022 OEM Server Licensing

Task	Time (sec)	Steps
Startup system (Windows Server® 2022 autoboot)	305	1
Set up Windows Server 2022	23	5
Log in	9	2
Initialization	24	1
Total	361	9

Deploy a Dell PowerEdge R750 Server Manually by Installing Windows Server 2022 with Volume Licensing

Task	Time (sec)	Steps
Power on/configure	147	16
Download Windows Server® 2022	370	1
Set up Dell™ Lifecycle Controller	331	27
Deploy the operating system (OS) in Dell Lifecycle Controller	27	10
Install Windows Server 2022	292	2
Set up Windows Server 2022	995	7
Log in	6	4
Initialization	25	1
Total	2,193	68

Windows Server® 2022 Installation Type	Time (sec)	Percent Savings
Manual	2,193	
Preinstalled	361	
Time Savings	1,832	83.5%

¹ See the Appendix "[Test Time](#)" for time savings details.

² Testing was completed as of 9/14/2021.

³ Windows Server® 2022 Standard, 16 cores pricing for a Dell™ PowerEdge™ R750 PowerEdge server comparison based on data from www.dell.com/en-us/work/shop/servers-storage-and-networking/poweredge-r750-rack-server/spd/poweredge-r750/pe_r750_14794a_vi_vp and www.microsoft.com/en-us/windows-server/pricing. At the time of this writing, microsoft.com shows \$767 USD for OEM licensing and \$1,069 USD for volume licensing. This does not include hardware or user client-access licenses (CALs). This is a difference of \$302 USD, or 28 percent.

⁴ VIPRE. "SMB Security Trends." 2020. www.vipre.com/wp-content/uploads/2020/07/VIPRE_2020_IG_-SMB-SECURITY-TRENDS-_0715_US-1.pdf.

⁵ Fundera by Nerdwallet. "30 Surprising Small Business Cyber Security Statistics (2021)." December 2020. www.fundera.com/resources/small-business-cyber-security-statistics.

⁶ TechRepublic. "Budget breakdown: How IT budgets changed over the years." July 2021.

www.techrepublic.com/article/budget-breakdown-how-it-budgets-changed-over-the-last-5-years/.

⁷ Based on an IT admin salary of \$60 USD per hour; overhead is approximately 25 percent of salary, so fully loaded salary per hour is \$75 USD per hour for an IT admin. Source: Salary.com. "IT Administrator Salary in the United States." www.salary.com/research/salary/listing/it-administrator-salary.

⁸ 10 Windows Server® 2022 volume licenses x \$1,069 USD/license, plus approximate 6 hours of Arturo's time to deploy the servers at approximately \$75 USD/hour = \$10,690 USD licensing cost plus \$450 USD labor cost = \$11,140 USD total.

⁹ 10 Windows Server® 2022 OEM licenses x \$767/license plus approximate ten hour of Maya's time to deploy the servers at approximately \$75/hour fully loaded cost = \$7,670 licensing cost plus \$75 labor cost = approximately \$7,745 USD total.



The analysis in this document was done by Prowess Consulting and commissioned by Dell Technologies.

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