Choose your Verint video management system with confidence thanks to validation from Dell EMC

Pair Intel processor-powered Dell EMC PowerEdge R740xd2 servers with a video management system validated by Dell EMC

Organizations of all types and sizes protect their employees and assets using video surveillance solutions, with estimates of 127 million network and CCTV surveillance cameras shipped worldwide just in 2017.[1] With increased video surveillance comes new challenges for your data center to tackle. How can your business secure its cameras and video? Do you have the hardware to handle a large influx of video data and ensure high availability?

Dell EMC™ addresses these issues by pre-testing and pre-validating software in its Surveillance Validation Labs. To learn how this process could benefit users, we worked with engineers at the lab in Durham, NC, to validate Dell EMC PowerEdge™ R740xd2 servers, powered by Intel® Xeon® Gold 5120 processors, and Verint® EdgeVMS, a video management system (VMS) solution designed for the banking and retail industries. In two use cases, each with 97 cameras, the Dell EMC solution passed rigorous validation testing, proving its reliability as a surveillance infrastructure solution for the Verint EdgeVMS platform.

By choosing a validated security solution using Verint EdgeVMS and Dell EMC PowerEdge R740xd2 servers with Intel processors, your business can skip the costly hassles and risks associated with the trial and error of getting a surveillance infrastructure up and running.

Different surveillance setups met stringent verification standards

Efficient recording under normal load

☑ 119 MB/s average disk throughput

☑ 18% CPU utilization

Reliable performance during simulated disk failure and rebuild

☑ 119 MB/s average disk throughput

☑ 20% CPU utilization

About the Dell EMC PowerEdge R740xd2 server

The enterprise-grade PowerEdge R740xd2 server allows organizations to "bring storage closer to compute" with a "high-capacity, space-saving 2U design."[2] With the PowerEdge R740xd2, organizations can store up to 364 TB of data in a 2U rack server or scale out to 7.2 PB (520 drives) in a 42U rack full of R740xd2 servers.[3] Learn more in the Dell EMC PowerEdge R740xd2 server data sheet.

The PowerEdge R740xd2 server used in this testing had two Intel Xeon Gold 5120 processors, 28 physical cores, and 256 GB of memory, and it ran Microsoft® Windows Server® 2016 Datacenter Edition. For storage, the server had 26 8TB 3.5-inch NLSAS HDDs. We configured the storage under test using the Dell EMC PERC H730P Mini controller and created a RAID6 disk group with two dedicated hot spares for a total usable capacity of 160 TB.

What is the Dell EMC Surveillance Validation Lab?

Not all major data center technology suppliers have their own validation lab for surveillance solutions, which is what makes Dell EMC stand out in the surveillance infrastructure marketplace. The Surveillance Validation Lab works with leading surveillance providers from the Dell EMC partner ecosystem to test their video management solutions. Dell EMC then uses those findings to help organizations choose a tested and validated solution that meets the organizations' demands. Dell EMC believes their Surveillance Lab is the "most advanced, longest-running video surveillance validation lab in the world."[4] Globally, Dell EMC runs three surveillance testing and validation labs, which are part of a network of 20 test centers total.[5] Dell EMC claims to be the number one global surveillance infrastructure provider.[6]

Engineers in the Surveillance Lab put hardware and software solutions through the paces in what Dell EMC calls "extreme, real-world scenarios."[7] Extreme conditions include zero video frame drop over multiple failure scenarios, including drive, network, and controllers failures. The performance numbers the Dell EMC Surveillance Lab produces are not hero numbers, but worse case numbers, as the lab aims to show customers they can maintain performance without video loss under strenuous conditions.

Because the Surveillance Lab looks for worst case realistic test scenarios, their results may vary when compared to the results from other partners (i.e., integrators and VMS vendors).

Solution validations include:[8]

- Virtual/non-virtual
- Best practices
- Compute
- Networking
- Storage
- ISV application

Dell EMC also provides validation support that includes "solution documentation including reference architectures, white papers, technical notes, sizing guidelines and technical presentations."[9] When your business implements a VMS validated by Dell EMC, you do so knowing that Dell EMC has already tested and approved it for use.[10]

About Verint EdgeVMS

According to Verint, their EdgeVMS solution "features industry-leading security and business system integrations and is a powerful solution designed for long life and low cost of ownership."[11] This software includes:[12]

- EdgeVR—enables companies to record video using a networked video recorder

- Op-Center—helps customers manage Verint video recorders from a centralized location

- Guard-Center—enables organizations to manage live video views

- Vid-Center—allows users to view video management operations from a single pane of glass

- Evidence Center—provides a centralized platform for security staff or financial investigators to search through transactions

Learn more about Verint EdgeVMS.

How we tested and what we found

We worked with Dell EMC engineers to validate the Intel Xeon processor-powered PowerEdge R740xd2 server running Verint EdgeVMS. The Dell EMC Surveillance Lab in Durham, NC housed the server under test and testing equipment. Our engineers installed BIOS and firmware updates, provisioned local storage, and installed Windows Server 2016. Dell EMC engineers configured the networking, deployed the software required to complete the validations, and performed the validation testing. Our engineers ensured servers performed optimally during testing. They also reviewed raw testing results as well as Dell EMC Live Optics™ storage and server performance reports captured during validation testing to ensure that Dell EMC engineers completed the validation successfully without error.

A surveillance solution can fail to receive validation by dropping one or more frames or losing video. In two different use cases a) normal server load with 97 cameras simultaneously recording, and b) the same 97 cameras simultaneously recording while experiencing a server disk failure and a disk rebuild, the bare-metal Verint solution passed validation testing.

The results in this report show data for one Archiver. Verint EdgeVMS records video using software-defined Archiver roles, which discover camera feeds, check cameras to see if they are recording, process all video and multimedia streams, and commit them to storage.

About Intel Xeon Scalable processors

According to Intel, their Xeon Scalable processors are "workload-optimized to support hybrid cloud infrastructures and the most high-demand applications."[13] Intel Xeon Scalable processors are available in four feature configurations (Platinum, Gold, Silver, and Bronze) to match the needs of enterprises operating at many different levels. Learn more about Intel Xeon Scalable processors.

Test results - use case 1 - server under normal load

Camera parameters

- 1MBps/8Mbps camera
- HD1080 (1920x1080) resolution
- 30 frames per second
- H264 codec
- Continuous recording enabled for all cameras

Recording results	Archiver role 1
Maximum number of cameras	97
Average read bandwidth (MB/s)	15
Average write bandwidth (MB/s)	104
Average read IOPS	346
Average write IOPS	135
Peak IOPS	642
CPU Utilization	18%

Test results - use case 2 - server under simulated disk failure and disk rebuild

Camera parameters

- 1MBps/8Mbps camera
- HD1080 (1920x1080) resolution
- 30 frames per second
- H264 codec
- Continuous recording enabled for all cameras

Recording results	Archiver role 1
Maximum number of cameras	97
Average read bandwidth (MB/s)	15
Average write bandwidth (MB/s)	104
Average read IOPS	410
Average write IOPS	122
Peak IOPS	631
CPU Utilization	20%

For detailed performance results, see Appendix A.

As you might expect, continuous recording runder different conditions requires a reliable and CPU efficient server solution. If surveillance infrastructure isn't validated to meet the needs of a Verint VMS, it might not be able to handle the necessary throughput, resulting in video loss or missing frames from archived footage. Missing or incomplete footage might, for example, keep a retail store from delivering reliable evidence when prosecuting theft.

It's important to note that the number of cameras and the throughput results were the requirements set for this validation. These results do not indicate the maximum capability of the Dell EMC and Verint surveillance solution.

What do these results mean for your business?

A validated Dell EMC and VMS partner surveillance infrastructure can simplify the process of implementing a surveillance solution. Choosing a pre-validated, custom-tailored solution provided by Dell EMC can help take the guesswork out of the purchasing equation, which cuts down on research, trial and error time, and more. This frees IT staff to focus on other critical tasks while ensuring your organization gets a properly sized solution. By reducing the costs associated with solution acquisition and implementation, organizations can see a higher overall return on investment for their purchase. Buying a solution that's too big or small could require additional time and effort from IT staff to get infrastructure up and running and increase the time to successful implementation.
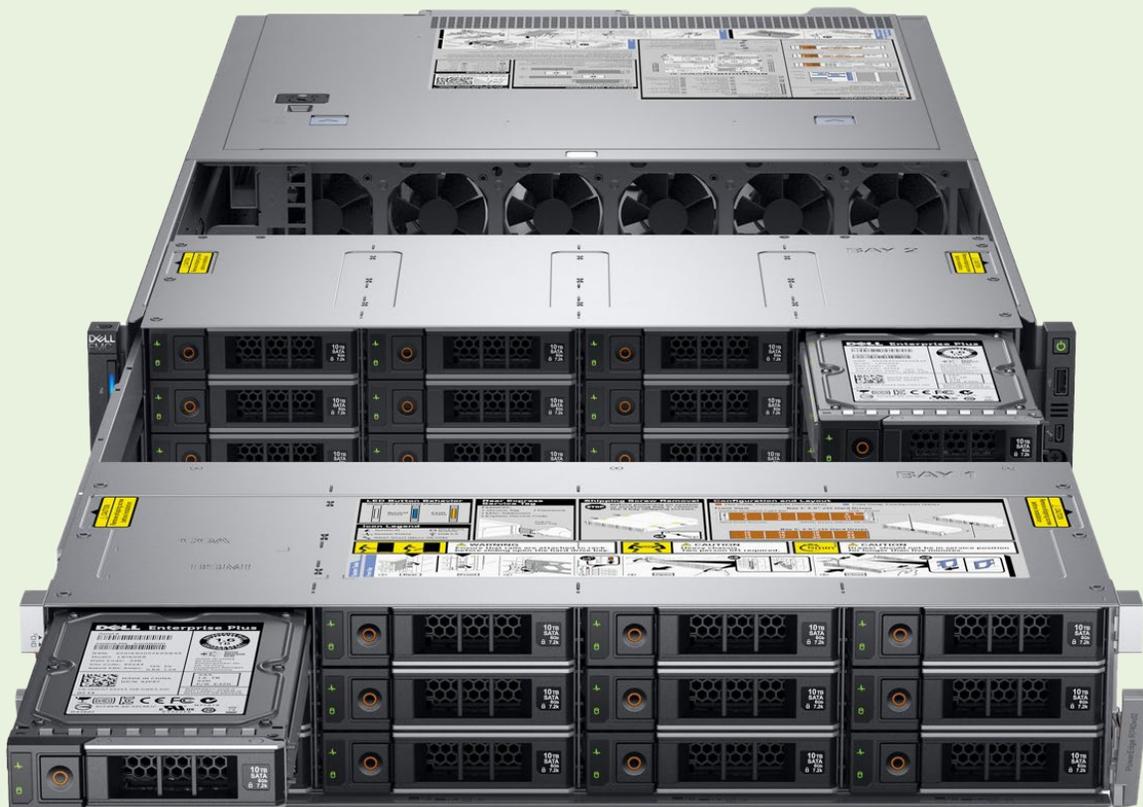
Conclusion

The right digital surveillance infrastructure may put your organization in a good position to handle the security issues of today and tomorrow. But reliability in surveillance infrastructure should be confirmed—you're protecting your customers, employees, and inventory, among other vital elements. The Dell EMC Surveillance Validation Labs can help your organization choose tested and validated solutions that meet your needs. We worked with the labs to validate Verint EdgeVMS on a Dell EMC PowerEdge R740xd2 server. The solution met verification requirements in two distinct use cases, showcasing its reliability in handling the tests with no dropped frames and efficiency by using just a small fraction of computing power to do so. The reliability and efficiency of this validated solution show that your organization can be confident running these Verint EdgeVMS configurations on Dell EMC PowerEdge R740xd2 servers for a dependable digital infrastructure.

1   IHS Markit, "Top Video Surveillance Trends for 2017," accessed October 26, 2018, https://cdn.ihs.com/www/pdf/TEC-Video-Surveillance-Trends.pdf.

2   Dell EMC, "PowerEdge R740xd2 Spec Sheet," accessed October 26, 2018, https://i.dell.com/sites/csdocuments/Product_Docs/en/poweredge-r740xd2-spec-sheet.pdf.

3   "PowerEdge R740xd2 Spec Sheet."

4   Dell EMC, "The Secret to a Successful Surveillance Solution," accessed October 26, 2018, https://www.emc.com/collateral/infographic/oem-surveillance-infographic.pdf.

5   "The Secret to a Successful Surveillance Solution."

6   Dell EMC, "Protecting what matters to make the world safer," accessed October 26, 2018, https://www.dellemc.com/en-us/solutions/surveillance-security.htm#scroll=off.

7   "Protecting what matters to make the world safer."

8   Dell EMC, "Dell EMC Surveillance Validation Labs: Protecting what matters to make the world safer," accessed October 26, 2018, https://www.emc.com/collateral/hardware/solution-overview/h17004-dellemc-surveillence-sb.pdf.

9   "Dell EMC Surveillance Validation Labs: Protecting what matters to make the world safer."

10 Dell EMC, "Partner Validations," accessed February 8, 2019, https://www.dellemc.com/en-us/solutions/surveillance-security/partner-validations.htm#

11 Verint, accessed October 30, 2018, https://www.verint.com/engagement/our-offerings/solutions/security/branch-surveillance-and-investigation/edge-video-management-software/index.html.

12 Verint, accessed October 30, 2018, https://www.verint.com/engagement/our-offerings/solutions/security/branch-surveillance-and-investigation/index.html.

13 Intel, accessed October 30, 2018, https://www.intel.com/content/www/us/en/processors/xeon/scalable/xeon-scalable-platform.html.

We concluded our validation on December 4, 2018. The results in this report reflect configurations that we finalized with Dell EMC on November 26, 2018 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Appendix A: Live Optics performance overview

## Performance of R740xd2 solution under normal load

Time Recorded	1 Day(s), 0 Hour(s), 0 Minute(s), 11/18/2018 - 11/19/2018		
Total Combined Capacity	160.31 TB	Peak Aggregate Network …	140.46 MB/s
Total Used/Free Capacity	23.74 TB / 136.57 TB	Total Memory	254.63 GB
IOPS	642 at peak, 486 at 95%	VM Guest Count	0
Read/Write Ratio	74% / 26%	Peak page fault of 8359 for server R740XD2113	
Average Daily Write	8.26 TB	A peak of 11.1 (18.1%) of 61.3 NetCPU Cycles (GHz)	
Total Cores / Total Proces…	28 / 2	20% of IOPS falls on 20% of your capacity (4.75 TB)	
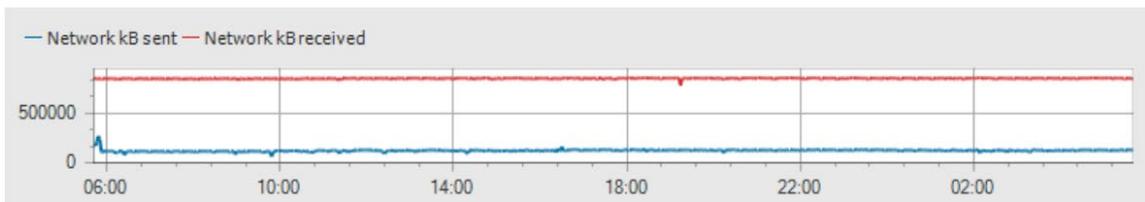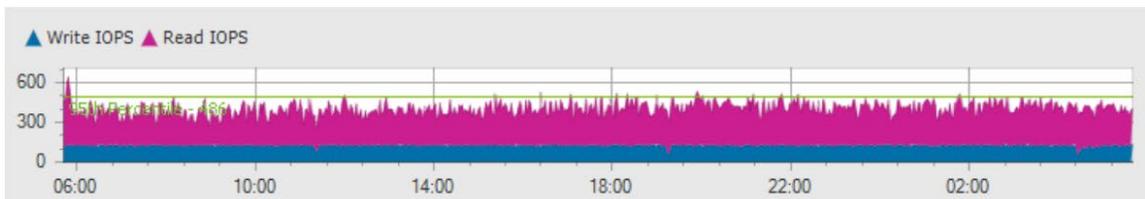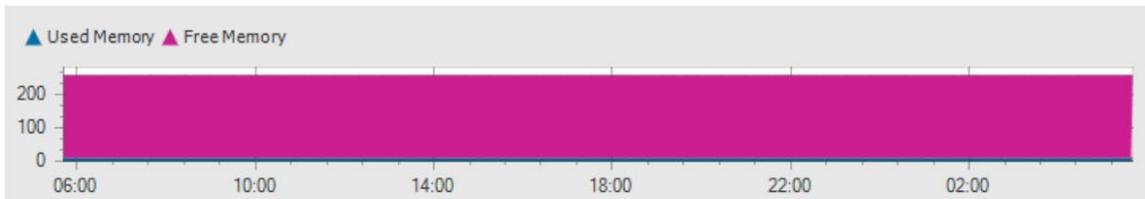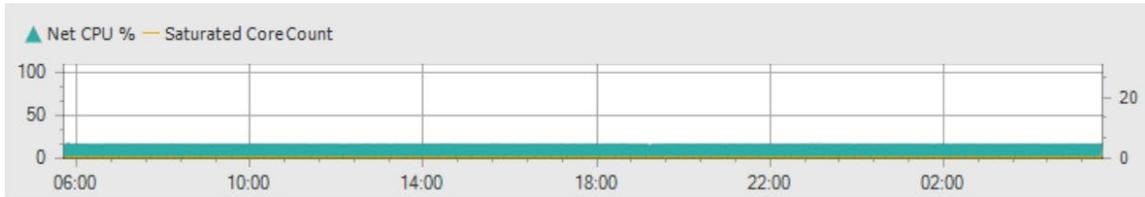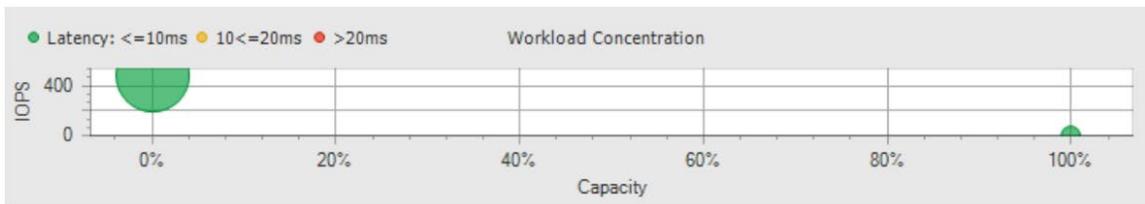
Performance of R740xd2 solution during disk rebuild test

Time Recorded	7 Day(s), 0 Hour(s), 0 Minute(s), 11/19/2018 - 11/26/2018		
Total Combined Capacity	160.31 TB	**Peak Aggregate Network ...**	133.20 MB/s
Total Used/Free Capacity	23.74 TB / 136.57 TB	**Total Memory**	254.63 GB
IOPS	713 at peak, 631 at 95%	**VM Guest Count**	0
Read/Write Ratio	80% / 20%	**Peak page fault of 6691 for server R740XD2113**	
Average Daily Write	8.20 TB	**A peak of 12.2 (19.9%) of 61.3 NetCPU Cycles (GHz)**	
Total Cores / Total Proces...	28 / 2	**20% of IOPS falls on 20% of your capacity (4.75 TB)**	
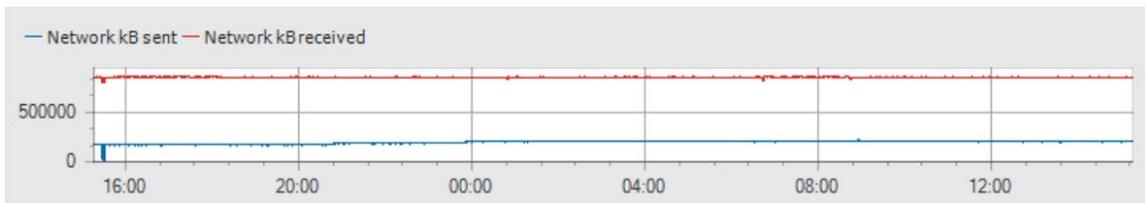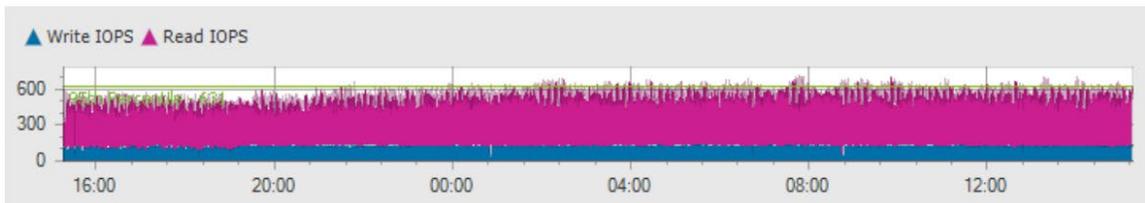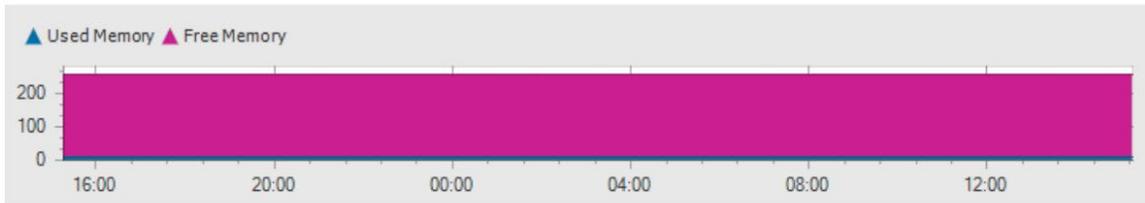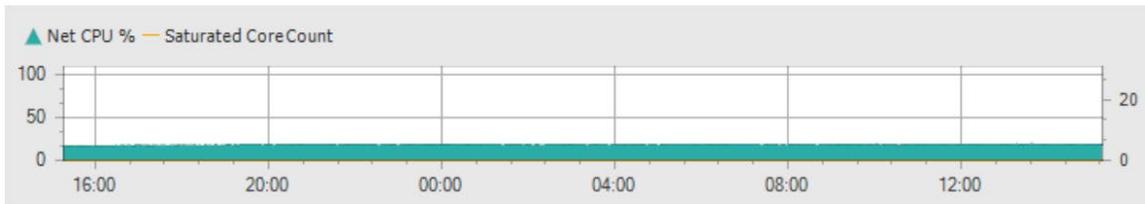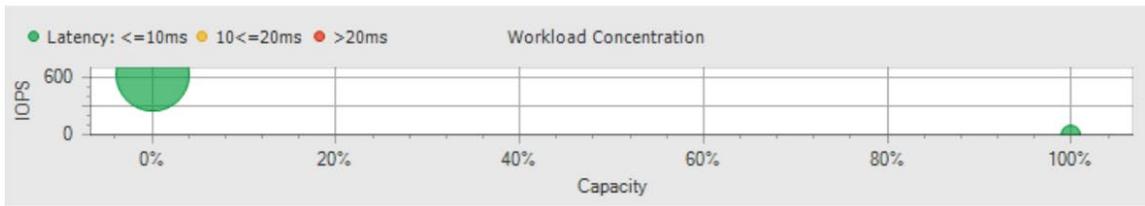
Appendix B: System configuration information

Server configuration information	Dell EMC PowerEdge R740xd2
BIOS name and version	Dell 1.0.2
Non-default BIOS settings	N/A
Operating system name and version/build number	Windows Server 2016, Version 1607, Build 14393.2273
Date of last OS updates/patches applied	11/06/18
Power management policy	Performance
Processor	
Number of processors	2
Vendor and model	Intel Xeon Gold 5120
Core count (per processor)	14
Core frequency (GHz)	2.20
Stepping	H0
Memory module(s)	
Total memory in system (GB)	256
Number of memory modules	16
Vendor and model	Micron® MTA18ASF2G72PDZ-2G6E1
Size (GB)	16
Type	DDR4-2400
Speed (MHz)	2,400
Speed running in the server (MHz)	2,400
Storage controller	
Vendor and model	Dell PERC H730P Mini
Cache size (GB)	1
Firmware version	25.5.3.0005
Driver version	6.603.6.0
Local storage (type A)	
Number of drives	26
Drive vendor and model	Dell ST8000NM0185 (Seagate OEM)
Drive size (GB)	8,192
Drive information (speed, interface, type)	7.2K, 12Gbps, SAS, HDD
Local storage (type B)	
Number of drives	2
Drive vendor and model	Dell SSDSCKJB240G7R (Intel OEM)
Drive size (GB)	240

Server configuration information	Dell EMC PowerEdge R740xd2
Drive information (speed, interface, type)	6Gbps, SATA, M.2 SSD
Network adapter	
Vendor and model	Broadcom® BCM57412 Dual 10G SFP+ Ethernet
Number and type of ports	2 x 10GbE
Driver version	20.8.24.0
Cooling fans	
Vendor and model	Nidec® UltraFlo® 4VXP3-X30
Number of cooling fans	6
Power supplies	
Vendor and model	Dell D1600E-S0
Number of power supplies	2
Wattage of each (W)	1,100

Appendix C: How we tested

PT engineers installed BIOS and firmware updates, provisioned local storage, and installed Windows Server 2016 on the servers. Dell EMC engineers configured the networking, deployed the software required to complete the validations, and performed the validation testing. PT engineers ensured that server performance was optimized during testing and reviewed raw testing results and Dell EMC Live Optics™ storage and server performance reports captured during validation testing. We cannot disclose Dell EMC proprietary processes related to this testing.

Installing Windows Server 2016 on the Dell EMC PowerEdge R740xd2 server

1. Insert the installation media into the CD/DVD drive, and restart the server.
2. When the option appears, press F11 to enter the Boot Manager.
3. Select UEFI Boot Menu.
4. Select the boot media, and press Enter.
5. When prompted to boot from DVD, press any key.
6. When the installation screen appears, leave language, time/currency format, and input method as default, and click Next.
7. Click Install now.
8. When the installation prompts you, enter the product key.
9. Select Windows Server 2016 Datacenter Edition (Server with a GUI), and click Next.
10. Check I accept the license terms, and click Next.
11. Click Custom: Install Windows only (advanced).
12. Select Drive 0 Unallocated Space, and click Next. Windows will begin and restart automatically.
13. When the Settings page appears, fill in the Password and Re-enter Password fields with the same password.
14. Log in with the password you set up in the previous step.

Installing firmware updates on the PowerEdge R740xd2 server

1. Download all firmware updates from the Dell EMC firmware repository.
2. To update the firmware on the following components, run the .exe files in this order:
   a. Dell iDRAC
   b. BIOS
   c. CPLD
   d. OS Driver Pack
   e. Network firmware and drivers
3. Reboot the server as required between firmware updates.

This project was commissioned by Dell EMC.