

VDI Evaluation of Dell PowerEdge R7425 Servers

The dual-socket PowerEdge R7425 server optimally supports Knowledge Worker VDI environments.



Executive Summary

Virtual Desktop Infrastructure (VDI) is an alternative to deploying dozens or even hundreds of individual desktop computers.

From an IT perspective, hundreds of desktop environments can be managed and secured from a single common server. In addition, tasks such as updating system parameters, applying security policies and performing data protection activities are centralized and performed from a single server.

From an end-user perspective, VDI provides an individual desktop environment that is customized to its users and provides those users the freedom to roam to different locations and use different devices to access their personal environment.

While VDI environments vary widely from a user and workload perspective, many of which require GPUs in the underlying infrastructure, many are often used for typical office worker tasks that do not require a separate graphics processing unit (GPU).

In order to test the suitability and robustness of a new server architecture for VDI environments, Dell commissioned Demartek to evaluate the performance of the Dell PowerEdge R7425 with two AMD EPYC 7551 32-core processors for non-GPU environments running the Login VSI Knowledge Worker workload. The Knowledge Worker workload used Microsoft Windows 10 Pro with Microsoft Office 2016 in each desktop virtual machine.

Key Findings

- > **VDI environments consisting of Knowledge Workers:** In general, the Dell PowerEdge 7425 server is a good price-performance solution for companies looking to implement VDI environments comprised primarily of Knowledge Workers.
- > **Scale up user counts:** For the Login VSI Knowledge Worker test, the AMD-based server performed well, easily supporting up to 200 users. The AMD EPYC-based server performed well and has room for growth, making it a good choice for VDI environments.
- > **Double number of users with minimal impact:** Scaling from 100 user sessions to 200 user sessions resulted in a less than 2% increase in the VSIbase score.
- > **Response time:** Response times were acceptable for as many as 200 user sessions running on this virtual desktop solution consisting of a single Dell PowerEdge R7425 server running VMware vSphere 6.5.

Login VSI Workloads

Login VSI has become the industry standard load-testing tool for VDI environments and has defined two workload-related tests – Knowledge Worker and Multimedia Workload.

The Login VSI **Knowledge Worker** test includes typical office productivity applications such as Microsoft Office, PDF reader, etc. and measures the total response times of several specific user operations being performed within a desktop workload. The Login VSI **Multimedia Workload**, on the other hand, uses graphically-intense applications like Google Chrome, graphically-heavy HTML 5 websites, and Microsoft PowerPoint with high resolution transitions. These tests observe behavior and performance while performing tasks like dragging windows, navigating between multiple applications, utilizing Google Earth, and more.

To evaluate the performance of Dell PowerEdge 7425 servers that do not leverage GPUs, the Login VSI Knowledge Worker test was used for this study.

Interpreting Login VSI Test Results

Tests measure the specific operational response times in the desktop workload (measured in milliseconds). Two values, in particular, are very important: **VSIbase** and **VSImax**.

- > **VSIbase**: This score measures the response time of specific operations performed in the desktop workload when there is little or no stress on the system. A low baseline indicates a better user experience—resulting in applications responding faster within the environment.
- > **VSImax**: This score measures the maximum number of desktop sessions attainable on the host before experiencing degradation in both host and desktop performance.

Both values, VSIbase and VSImax, provide vendor-independent, industry-standard and easy-to-understand metrics showing the performance and scalability of various hardware and software virtual desktop solutions.

Login VSI Scores

Login VSI provides this guidance for the **VSIbase** score, where lower is better:

Score range	Rating
0 – 799	Very Good
800 – 1199	Good
1200 – 1599	Fair
1600 – 1999	Poor
2000 – 9999	Very Poor

Source: *Login VSI Analyzing Results*

https://www.loginvsi.com/documentation/index.php?title=Login_VSI_Analyzing_Results#Analyzer_Graphs

Login VSI Workloads Additional Information

Login VSI provides additional information regarding its workloads at the following links:

Knowledge Worker Workload

<https://www.loginvsi.com/blog-alias/login-vsi/665-simulating-vdi-users-introduction-to-login-vsi-workloads>

Multimedia Workload

<https://www.loginvsi.com/products/login-vsi/add-ons/multimedia-workload>

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Test Configuration

Dell PowerEdge R7425 server with the following:

- > 2x AMD EPYC 7551, 2.0 GHz, 32c/64t (total 128 threads)
- > 1024 GB RAM
- > Dell PERC H730P RAID controller, firmware 25.5.4.0006
- > VMware ESXi 6.5.0, build-7526125
- > Datastore 1 (OS) – 4x 185GB SSD, RAID10
- > Datastore 2 (VMs) – 12x 800GB SSD, RAID6
- > Datastore 3 (VMs) – 8x 960GB SSD, RAID6
- > GPUs – none

Virtual Machines

- > Microsoft Windows 10 Pro x64, version 1709, build 16299.309
- > 2 vCPU, 4GB RAM

Test Results

Tests showed that as the number of user sessions increased, the VSI scores increased only slightly, indicating that this server has plenty of headroom for higher numbers of user sessions.

*Scaling from 100 user sessions to 200 user sessions resulted in a less than 2% increase in the **VSIbase** score.*

The difference between the VSI_{max} Average value and VSI_{max} Threshold value is an indication of how much higher the solution can scale. The VSI_{base} scores show that while the number of users is increased, response times do not dramatically increase.

The tests also showed that the Dell PowerEdge R7425 server can support 200 users with no “stuck” sessions. Based on the results observed with this configuration, it is plausible that higher numbers of users might be possible to achieve if each user virtual machine is allocated less memory.

Overall Performance

The Dell PowerEdge R7425 server comfortably handled up to 200 users running the Knowledge Worker workload, with no “stuck” sessions. This means that, per user, the R7425 is a very cost-effective solution for virtual desktop environments and takes advantage of the management, security and operational efficiencies that virtual desktop infrastructure provides.

Summary and Conclusion

Results of LoginVSI tests performed for this study show that the Dell PowerEdge R7425 is a good solution for VDI environments consisting of primarily Knowledge Workers, providing a lower cost of ownership since the server does not need to be populated with GPUs.

Login VSI Knowledge Worker Results Summary – Dell PowerEdge R7425 with no GPUs

User Sessions	VSIbase*	VSI _{max} Avg.*	VSI _{max} Threshold*	Threshold - Avg. Difference*
100	780	851	1781	930
140	793	906	1794	888
200	790	971	1790	819

* Milliseconds

The most current version of this report is available at <https://www.demartek.com/Dell-R7425-VDI-Evaluation/> on the Demartek website.

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