PowerEdge R740 Accelerates Microsoft SQL Server Performance

Tech Note by:
  Tad Walsh

SUMMARY

The new 14th-generation PowerEdge R740 is an ideal server for back-end workloads including database and business intelligence.

The Dell EMC Solutions Engineering team tested the R740 with Microsoft SQL Server 2016 to evaluate its performance relative to the previous-generation PowerEdge R730.

The results show that the R740 delivers 41% more transactions per second, a 50% increase in the user load, and a 50% reduction in the average query response time, compared to the R730.

Data centers wanting to increase overall throughput and boost transactions per second while simultaneously reducing response times should consider the PowerEdge R740 for their IT infrastructure.

With the recent introduction of Dell EMC PowerEdge 14th-generation (14G) servers, customers are gaining the benefits of increased performance, lower total cost of ownership, and accelerated time to value for their business-critical applications. The scalable business architecture of PowerEdge 14G servers enables customers to scale efficiently and adapt quickly to dynamic business and workload needs. These servers also provide intelligent automation for routine tasks, freeing up skilled resources for higher priority functions. Moreover, PowerEdge 14G servers protect organizations and their customers with sophisticated and integrated security features built into the server platform.

As customers evaluate these new servers to bring them into their IT infrastructures, a key area of planning focus is on performance. To help customers in this effort, the Dell EMC Enterprise Solutions team conducted a study to compare the performance of the new 14G PowerEdge R740 relative to the previous-generation 13G PowerEdge R730, both in a Microsoft SQL Server 2016 environment.
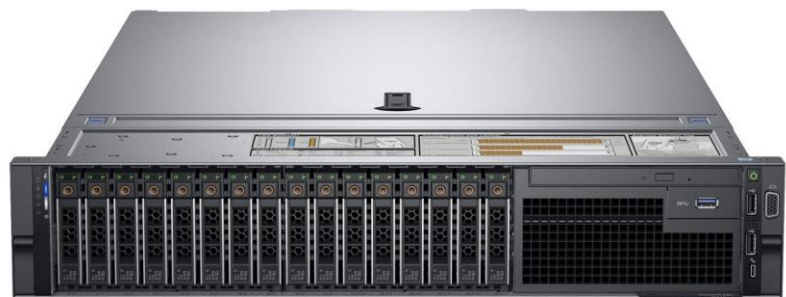

Figure 1: The PowerEdge R740 server

The PowerEdge R740 is a 2-socket, 2u server featuring the Intel Xeon Processor Scalable family with up to 28 cores per processor (up to 56 cores per server). It uses highly scalable memory, I/O and network options and provides up to 80TB of internal storage with sixteen 2.5" drives or eight 3.5" drives. It is an ideal server for back-end workloads including database and business intelligence.

In this light, the Dell EMC Solutions Engineering team tested the R740 to evaluate its "fit" as an appropriate computing platform for Microsoft SQL Server 2016 online transactions processing (OLTP) workloads, and to evaluate its performance relative to the PowerEdge R730.

For an OLTP environment, the most commonly used metrics are transactions per second (tps) and Average Query Response Time (AQRT). Along with tps and AQRT, CPU utilization and memory utilization data were also collected during the testing.

The results of the testing are shown in Figure 2 below. As can be seen, the new 14th-generation PowerEdge R740 not only delivers impressively high performance, it produces significantly higher performance than the previous-generation R730: 41% more transactions per second, a 50% increase in the user load, and a 50% reduction in the average query response time. These results provide powerful incentive for users to move to the latest, 14th-generation technologies.
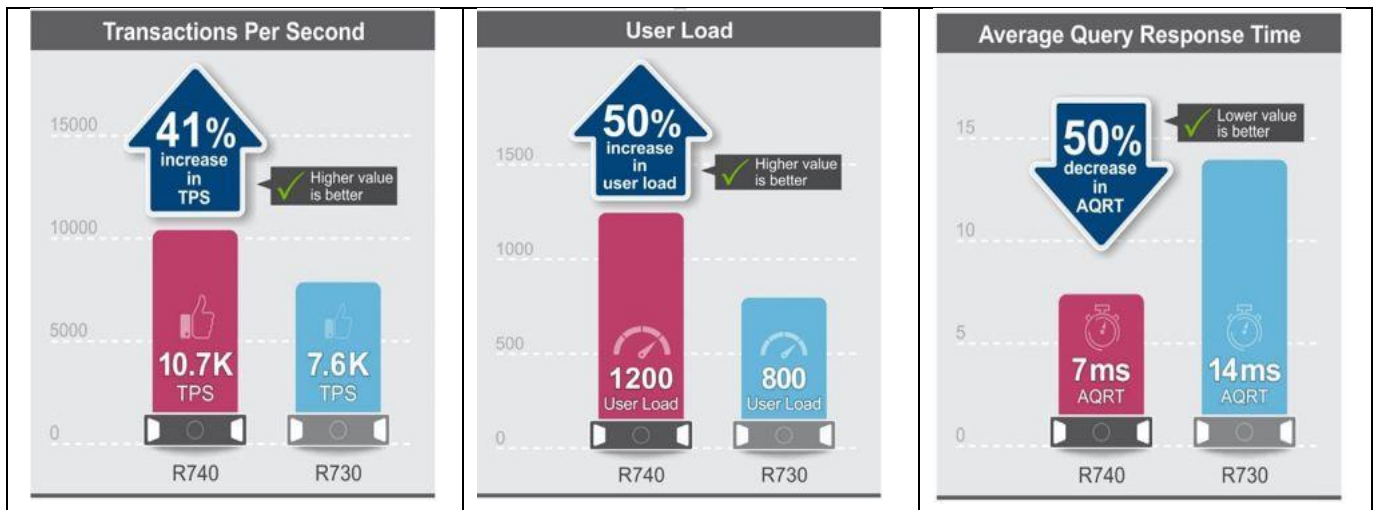

Figure 2: Comparative performance of the PowerEdge R740 server relative to the previous-generation PowerEdge R730.

Conclusion
In this study, the performance of the 14th-generation PowerEdge R740 running SQL Server 2016 OLTP workload was analyzed and compared to that of an analogous, previous-generation server, the 13-generation PowerEdge R730. The results of the testing show that:

- User load, a measure of efficient utilization of the system, increased from 800 on the R730 to 1,200 on the R740, a 50% increase. This means that significantly more work can be accomplished on the R740.

- Transactions per second (tps) jumped from 7,600 tps on the R730 to 10,700 tps on the R740, meaning that 41% more transactions are processed *per second* on the R740.

- Average query response time (AQRT) was reduced by 50%, moving from 14 milliseconds on the R730 to just 7ms on the R740, meaning that results were available faster on the R740.

This study demonstrates that highly significant performance improvements are delivered by the latest generation of Dell EMC PowerEdge servers. Data centers wanting to increase overall throughput and boost transactions per second while simultaneously reducing response times should consider the PowerEdge R740 for their IT infrastructure.

Notes:
- For further information on this performance evaluation, see the full white paper "*Accelerating Microsoft SQL Server 2016 Performance with Dell EMC PowerEdge R740*" at http://en.community.dell.com/techcenter/enterprise-solutions/m/sql_db_gallery/20444569/ .

- For additional technical information about the R740, please refer to the **PowerEdge R740/R740xd Technical Guide** at http://www.dell.com/learn/us/en/usbsd1/shared-content~data-sheets~en/documents~poweredge_r740_r740xd_technical_guide.pdf

- For general information about the PowerEdge R740, visit http://www.dell.com/en-us/work/shop/povw/poweredge-r740

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