Demartek

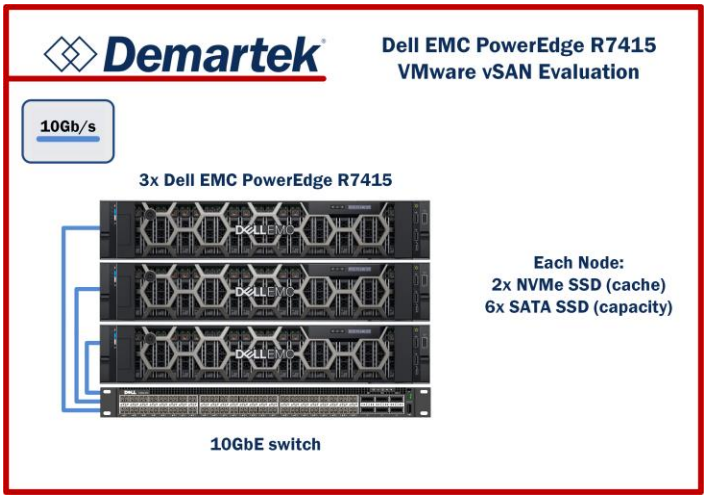
# Dell EMC PowerEdge R7415 AMD EPYC VMware vSAN Mixed Workloads Performance

*Dell single-socket AMD EPYC systems running VMware vSAN provide solid TCO benefits.*


## Executive Summary

Dell EMC provides VMware vSAN Ready Nodes that combine a wide range of Dell hardware and VMware vSAN software into a ready-to-order package. These include the new single-socket Dell EMC PowerEdge R7415 servers powered by the AMD EPYC 7000-series processors. These Dell EMC vSAN Ready Nodes are validated and configured to meet hyper-converged workload needs while taking advantage of ***lower single-socket licensing costs*** from VMware.

Dell commissioned Demartek to evaluate the performance of the new Dell EMC PowerEdge R7415 servers that use the AMD EPYC 7000-series of processors. Mixed enterprise workloads were run in this VMware vSAN cluster using one model of the AMD EPYC processor in each of three identical nodes. Then the tests were repeated using different models of AMD EPYC processors in the vSAN cluster nodes.




Several enterprise workloads were run simultaneously in virtual machines (VMs) across each cluster, including:

> **Microsoft SQL Server** running an online transaction processing (OLTP) workload

> **Microsoft Exchange Jetstress** running an email server storage stress test

> **Iometer "All-in-one"** workload to stress test the storage devices.

In addition, separate, stand-alone tests were conducted with another database workload known as **DVD Store 2** running in a VM in the vSAN cluster.

## Key Findings

> **TCO** – In addition to reduced hardware costs for single-socket servers, VMware vSphere and vSAN licensing costs are $7610 lower for single-socket servers, per node.

> The vSAN mixed workloads achieved comparable throughput performance results of approximately 400 MB/s using only ***single-socket*** AMD EPYC systems as compared to the previous generation ***dual-socket*** Dell EMC PowerEdge R730 systems.

> For the vSAN DVD Store 2 results the single-socket 24-core and 32-core AMD processors achieved **78%** of current generation traditional dual-socket systems for max operations per minute (OPM).

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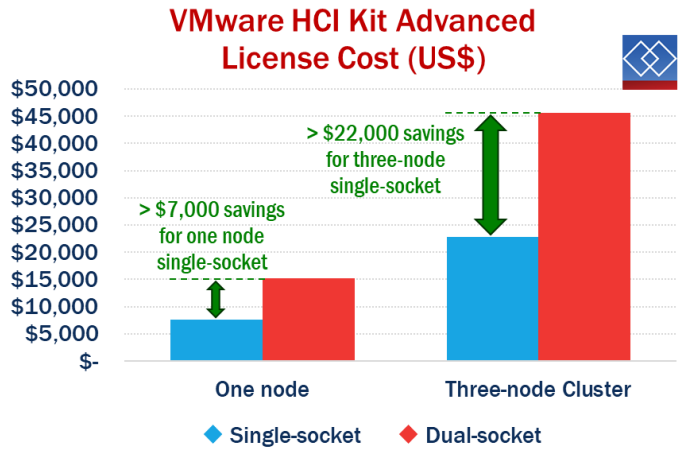
## Total Cost of Ownership Comparison

The chart below shows the VMware HCI Kit Advanced licensing costs for a one-node and three-node cluster, comparing single-socket servers to dual-socket servers. The VMware HCI Kit includes a license for vSAN and vSphere. For a one-node system, a single-socket server can deliver $7,610 in savings on VMware licensing costs. For a three-node cluster, these licensing cost savings are $22,830.



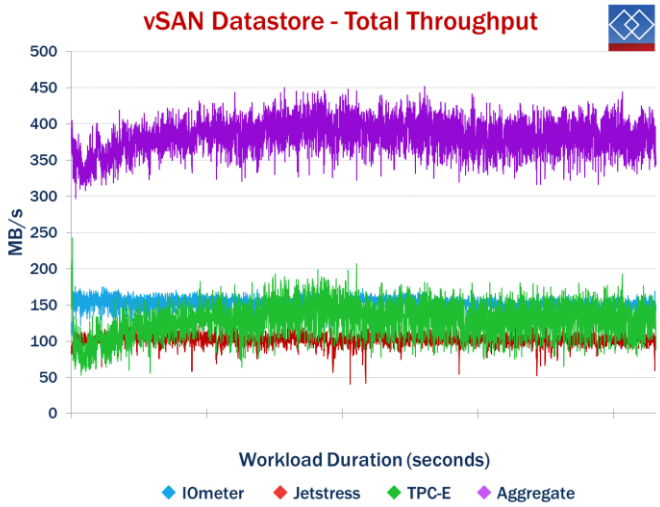

* Based on the VMware HCI Kit cost of $7,610 per CPU, part number HCI-ADV-CPU-C, as of April 2018. This is the list price in US dollars before any volume discounts or promotional discounts are applied.

## Performance Tests

### DVD Store 2 (DS2) Max Operations Per Minute (OPM)

| | DS2 Max OPM | Percentage Max OPM |
|---|---|---|
| **Single-socket AMD EPYC 7551P 32-core** | 61509 | **78.1%** |
| **Current generation traditional dual-socket system** | 78787 | 100% |

### Mixed Workload Throughput




## Summary and Conclusion

In our tests, we achieved comparable throughput performance (approx. 400 MB/s) in our mixed-workload tests on the single-socket Dell EMC PowerEdge R7415 running VMware vSAN compared to that obtained in a similar, but not identical, set of tests running on a previous generation dual-socket system (approx. 460 MB/s). In our DS2 tests, we achieved approximately 78% of the performance of a current generation dual-socket system using two different processors in a single-socket configuration.

There are total cost of ownership (TCO) benefits to deploying applications on a single-socket system including VMware vSphere and vSAN licensing savings of $7,610 per node for the single-socket servers. For users running mixed enterprise workloads in VMware vSAN environments, a single-socket system such as the Dell EMC PowerEdge R7415 can be an excellent choice of server.

The most current version of this report is available at http://www.demartek.com/Demartek_Dell_EMC_PowerEdge_R7415_vSAN_Mixed_Workloads_Evaluation_2018-04.html on the Demartek website.