Accelerate vSAN Deployments with Broadcom NetXtreme Ethernet Adapters

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SUMMARY

Dell EMC PowerEdge servers equipped with Broadcom NetXtreme 10/25Gb Ethernet solutions provide the building blocks to simplify deployment and speed scaling with unmatched performance.

Within this paper we discuss the impact 10/25Gb NetXtreme Ethernet Adapters can have on a PowerEdge R740xd vSAN Cluster

Proof of concept performance testing and results discussed were achieved utilizing industry standard HCIBench on a PowerEdge R740xd vSAN Cluster at Broadcom laboratories

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Improve vSAN Performance with 10/25Gb Ethernet

When considering performance reliant applications within the datacenter customers are always considering server and adapter choices that will have the broadest impact for dollar spend. Often times customers want to verify that the changes made will impact the application requirements for high speed network performance. As more applications become optimized for a vSAN distributed layer of software included in the ESCi hypervisor. The features such as High Availability (HA), vMotion, and Distributed Resource Scheduler (DRS) require efficiency within the stack. Since each host in a vSAN cluster can contribute storage to the cluster it is essential to evaluate and eliminate any potential throttle points in the architecture which could reduce application performance.

Dell EMC PowerEdge R740, R640 and R940 servers include Broadcom NetXtreme 10Gb Ethernet adapters in the default server configurations. Enterprise customers have moved from 1Gb to 10/25Gb at an accelerated pace since 10/25Gb provides clear benefits to accelerate customers' use case deployments, which translates to better value, better service and lower TCO for the customer.

To determine the full impact Broadcom have conducted some testing utilizing Hyper-converged Infrastructure Benchmark (HCIBench) to determine testing in a consistent and controlled manner. The results of which will give us an excellent performance comparison between network speeds. The results here are key indicators for expected performance gain from a 10/25Gb Ethernet deployment

vSAN Test Node Configuration
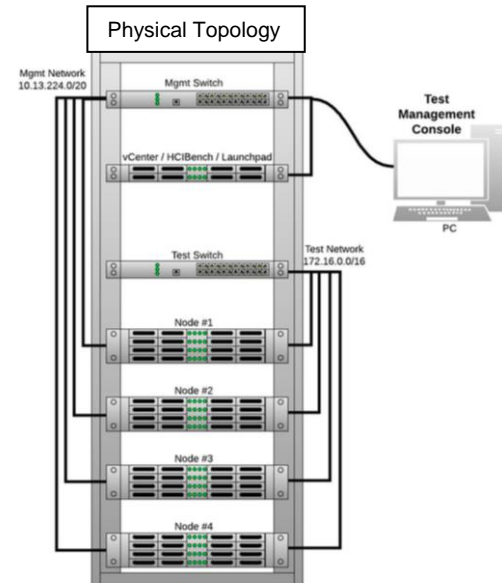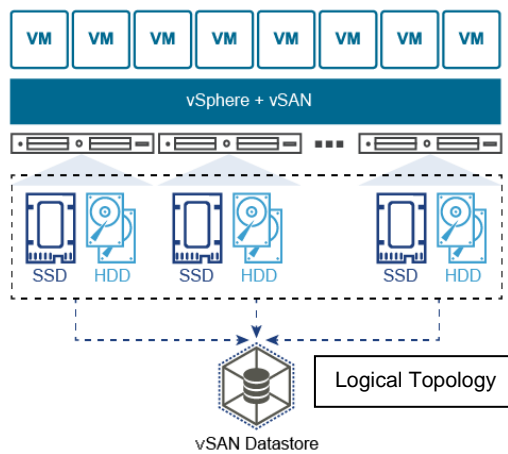
- **PowerEdge R740xd Node Configuration**
- 2 x Intel Xeon Gold 6134
- 8C/16T 3.2GHz
- 12 x 32GB RDIMM 2666MT/s Dual Rank
- HBA330 12Gbps
- Boot: BOSS controller card 2x M.2 240G RAID 1
- Cache Tier: 4 x Dell 800GB NVMe PM1725a
- Capacity Tier: 8 x 1.92TB SSD SAS Read Intensive 12Gbps

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According to [VMware vSAN host design guidelines](#) best practices indicate that it is absolutely critical to provide more bandwidth for vSAN traffic to improve performance:

- *If you plan to use hosts that have 1-GbE adapters, dedicate adapters for vSAN only. For all-flash configurations, plan hosts that have dedicated or shared 10-GbE adapters.*

- *If you plan to use 10-GbE adapters, they can be shared with other traffic types for both hybrid and all-flash configurations*

- *If a 10-GbE adapter is shared with other traffic types, use a vSphere Distributed Switch for vSAN traffic to isolate the traffic by using Network I/O Control and VLANs.*

- *Create a team of physical adapters for vSAN traffic for redundancy.*

VMware vSAN deployments on Dell EMC PowerEdge servers and Broadcom NetXtreme Ethernet adapters are a proven, typical use case for Dell EMC customers. VMware vSAN enables Hyperconverged infrastructures (HCI) for business critical business applications such as Oracle, Exchange and SAP with Enterprise reliability, security and performance. These mission-critical applications running on VMware vSAN easily increase their performance through the benefit from 10/25Gb Ethernet speeds without the need to update any other hardware or any software.
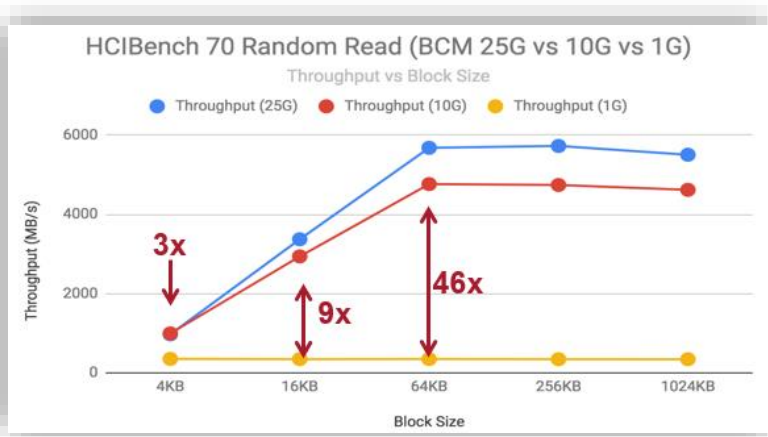

25Gb Ethernet Performance Testing HCIBench Results

Applications running on VMware vSAN will see immediate results moving from 1Gb to 10Gb Ethernet speeds. Using four PowerEdge R740xd servers and Broadcom's 10/25Gb NetXtreme Ethernet adapters, VMware vSAN demonstrated tremendous perform improvements with the HCIBench benchmarking tool. In our proof of concept testing actual results below have showed 10Gb throughput increasing up to 46 times compared to that of 1Gb. Moreover, 25Gb showed another

21% increase in throughput improvement over 10Gb[i].

See Immediate Results with 10/25Gb Storage IOPS

On the storage front, deployments that leverage Dell EMC PowerEdge Servers and Broadcom NetXtreme 10/25Gb Ethernet adapters will see immediate storage performance results on VMware vSAN when moving from 1Gb to 10Gb. Storage IOPS improves up to 14 times with 10Gb Ethernet versus 1Gb. Moreover, 25Gb Ethernet demonstrated another 15% in IOPS performance over 10Gb.
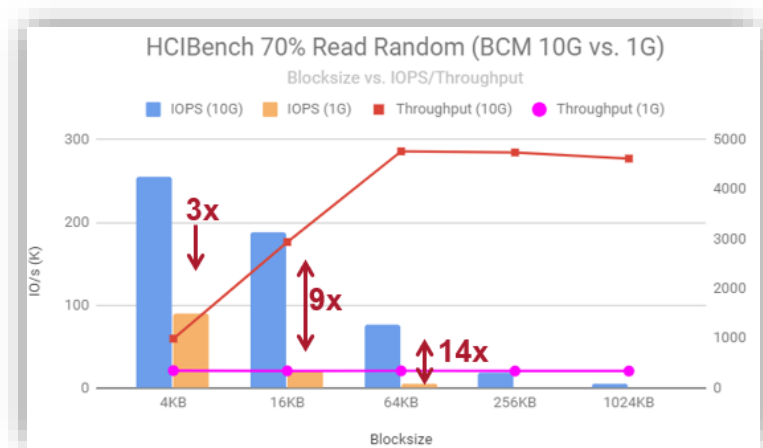
Conclusion
Dell EMC PowerEdge servers coupled with Broadcom NetXtreme 10/25Gb Ethernet solutions provide the building

blocks to simplify deployment and speed scaling with unmatched performance. To increase performance, customers simply need to move their network from 1Gb to 10Gb thus increasing throughput and storage IOPS. The move to 10/25Gb Ethernet speeds translates to increased application performance along with better utilization and scaling of existing compute power and storage performance. This testing is clear that vSAN deployments would significantly benefit from upgrading from 1Gb to 10/25Gb speed

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[i] Performance results based on internal Dell EMC / Broadcom testing conducted Feb 2019 Ref #19000041

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