For vSAN 7.0 U2 clusters: RDMA-capable Intel® Ethernet 800 Series Network Adapters

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Move Data Faster with RDMA capable Intel® Ethernet 800 Series Network Adapters

vSAN clusters can get higher throughput, lower CPU utilization, and lower latency with RDMA capable Intel® Ethernet 800 Series Network Adapters.

- RDMA-capable Intel® Ethernet 800 Series Network Adapters are a key ingredient in the network infrastructure for a vSAN environment.

- With RDMA enabled, testing revealed
  - Higher Throughput (up to 17% IOPS improvement),
  - Lower CPU Utilization (up to 7% reduction) freeing up the CPU for other apps/tasks.
  - Lower Latency (For large block sizes: up to 29% WRITE / 14% READ lower latency)
Reduce Bottlenecks in High-Performance Storage Access

**Higher throughput. Lower CPU utilization. Lower latency.**

Single-click to enable RDMA in VMware vSAN 7.0U2

Intel® Ethernet 800 Series Network Adapters with support for RDMA
vSAN Test Cluster
Enable RDMA on vSAN 7.0U2

Platform: Intel Server System M50CYO (Intel® Xeon® Scalable platform)
Processor: 2x Intel® Xeon® Scalable Processors 6348 CPU (2.6GHz, 28 core)
RAM: 512GB (16 x32GB 3200MHz RDIMM)
BIOS: SE5C6200.86B.2021.D40.2103100308
Storage: Cache Drive: 2x Intel® SSD DC P4800X (375GB) (NVMe)
Capacity Drive: 8x Intel SSD DC P5510 (3.84TB) (NVMe)
Network: Intel® Ethernet Network Adapter E810-CQDA2

Three performance indicators were chosen to compare vSAN performance with RDMA on vs. RDMA off.
1. IOPS, Input/Output Operation per second, is to measure how many IO operations can be done per second by all client systems. The more IOPs the better.
2. Average latency was measured for both READ and WRITE operations to show how fast IO operations can be done. The lower latency the better.
3. CPU utilization was measured as well to show how much CPU cycles needed to deal with those IO operations. You want to have lower CPU utilization so that CPU cycles can be spent on actual business applications.
VMware vSAN: Higher Throughput & Lower CPU Utilization
RDMA on vs. RDMA off

vSAN 7.0U2 Relative IOPS Improvements and CPU Usage Reduction using Intel® Ethernet Network Adapter E810-CQDA2 with RDMA enabled

70% Read workload, 128 Outstanding IOs

Up to 17% IOPs improvement and 7% CPU utilization reduction with RDMA on vs. RDMA off

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See configuration disclosure for details. No product or component can be absolutely secure. See backup for configuration details. For more complete information about performance and benchmark results, visit www.intel.com/benchmarks. Refer to https://software.intel.com/articles/optimization-notice for more information regarding performance and optimization choices in Intel software products.
VMware vSAN: Lower Latency
RDMA on vs. RDMA off

vSAN 7.0U2 Relative READ/WRITE Latency Reduction
using Intel® Ethernet Network Adapter E810-CQDA2 with RDMA enabled

Read Latency
Write Latency

4KB block size     8KB block size     16KB block size     32KB block size     64KB block size

-8%   -8%   -6%   -8%   -7%   -18%   -10%   -15%   -14%   -29%

70% Read workload, 128 Outstanding IOs

Lower is better

Up to 29% WRITE / 14% READ latency reduction with RDMA on vs. RDMA off

Intel Server System M50CYO, 2x Intel® Xeon® Scalable Processors 6348 CPU (2.6GHz, 28 core), 512GB (16 x 32GB 3200MHz RDIMM), Cache Drive: 2x Intel® SSD DC P4800X (375GB), Capacity Drive: 8x Intel® SSD DC P5510 (3.84TB), Intel® Ethernet Network Adapter E810-CQDA2

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