VIKING™
Enterprise Solutions

Viking Enterprise Solutions VSS2249R Storage Server

VSS2249R STORAGE SERVER

A dense 2U form factor with 24 dual-ported drive bays that utilize PCIe Gen4 and NVMe technologies

Viking Enterprise Solutions (VES) is a leading storage and server development company that specializes in developing systems for enterprise OEM customers, providing large-scale solutions for high performance and cloud computing.

ABOUT VIKING

We outfitted the VSS2249R Storage Server with 24 **KIOXIA CM6 7.68TB PCIe Gen4 NVMe SSDs.** The CM6 Series SSDs deliver up to 1.4 million IOPS (random read) and 350K IOPS (random write), with a maximum power consumption of 25W. The CM6 features BiCS FLASH TLC NAND, MTTF of 2,500,000 hours, and a 5-year warranty. The CM6 is also dual-ported to provide high availability. These drives leverage the U.3 form factor (SFF-TA-1001 conformant), allowing users to operate them in tri-mode enabled backplanes.

HARDWARE CONFIGURATION

To measure the performance of the 24 KIOXIA CM6 PCIe Gen4 NVMe SSDs, we configured each SSD with two namespaces, splitting the drives in half. Each namespace was then pre-filled to capacity before being partitioned to 25% of its size so that our tests worked within 25% of the total drive's capacity for a working dataset size of 46TB.

2 x AMD 7742 CPUs
(single processor nodes)

512GB RAM
(256GB per node)

CentOS 7
(3.10.0-1062.el7.x86_64)

24 x KIOXIA KCM6XRUL7T68 7.68TB CM6

TEST RESULTS

Peak throughput in our 4K random read and random write workloads were the highest numbers we've ever recorded for a 2U system

Read performance measured in at 23.5M IOPS, working out to about 11.7M IOPS per node, or 980K IOPS per SSD. Write performance was equally as impressive, measuring 16.63M IOPS, or 690K IOPS per SSD.

THROUGHPUT
4K random read and random write workloads

	TOTAL	PER SSD
4K Random Read 11.8M @ 2.08ms + 11.7M @ 2.09ms	**23.5M** IOPS	**980K** IOPS
4K Random Write 7.33M @ 3.3ms + 7.3M @ 3.4ms	**14.63M** IOPS	**690K** IOPS

While high throughput is great for high-speed transactional workloads, high bandwidth is equally as important for areas that need to ingest data quickly. The VSS2249R didn't disappoint in this area either. We recorded an astounding 125.3GB/s read in our 64K sequential workload or 5.22GB/s per SSD. Sequential write bandwidth came in at 63.2GB/s or 2.63GB/s per SSD. There isn't much that comes close to these figures in the market today.

BANDWIDTH
64K sequential read and random write workloads

	TOTAL	PER SSD
64K Seq Read 62.7GB/s @ 1.5ms + 62.6GB/s @ 1.5ms	**125.3**GB/s	**5.22**GB/s
64K Seq Write 31.6GB/s @ 3.0ms + 31.6GB/s @ 3.0ms	**63.2**GB/s	**2.63**GB/s

From a mixed workload perspective, the VSS2249R carried on with the trend of exceeding our expectations. In our 4K 70/30 workload, we measured an aggregate performance level of 7.64M IOPS. In a larger 8K 70/30 workload size, we measured 3.82M IOPS or 159.2K IOPS per SSD. Lastly in our SQL profile with a 97/3 R/W spread, the platform topped out at 11.85M IOPS, or just under 500K IOPS per SSD.

MIXED WORKLOAD
4K 70/30 workload

	TOTAL	PER SSD
4K 70/30 3.813M + 3.824M	**7.637M** IOPS	**318K** IOPS
8K 70/30 1.893M + 1.927M	**3.82M** IOPS	**159.2K** IOPS
SQL 5.932M + 5.915M	**11.847M** IOPS	**494K** IOPS

CONCLUSION

In total, it's clear that Viking Enterprise Solutions is an engineering first organization. We can see this DNA in the physical build of the system, ranging from the well-executed midplane to the easily accessible field replaceable parts. Further, the cooling layout is superb, which is critical to driving performance. On that note, the VSS2249R Storage Server excels, cranking out over 125GB/s in a 2U box. The build and performance profile affords the VSS2249R a lot of flexibility in terms of workloads. Any performance-hungry application would be thrilled to run on this box. It's absolutely fantastic.

Learn More About the Test