SOLUTION BRIEF

QxStack vSAN ReadyNode -Solution Brief for MSSQL

vmware

Solution Brief

MS SQL Server Performance-

QxStack QuantaGrid D51BP-1U All NVMe

Value of Information

IT organizations are increasingly turning toward hyper-converged infrastructure (HCI) solutions to simplify and speed up infrastructure deployment, ease day-to-day operational management, reduce costs, and increase IT speed and agility. Meanwhile, the information exponentially grows in the volume, variety, and velocity of data. The need to find new ways to digest, process, and analyze the data for better decision making is relatively significant. QCT provides an all-flash solution for accelerating information processing which can assist organizations to serve more customers and speed up the data analysis.

IOPS-Optimized Solution

QCT offers organizations an exceptionally robust, easy-to-use, and highly-scalable solution. This pre-tested and validated all-flash infrastructure is integrated with industry-leading hyper-converged virtualization software from VMware. This integrated software and hardware solution is fully-validated and delivers enterprise-class performance and reliability.

Designed to combine Intel® Xeon® Processor E5 Family and Intel® NVMe storage devices, QuantaGrid D51BP-1U as a foundation for IOPS-optimized SKU delivers exceptional transactional processing performance and responsiveness.

VMware vSAN™

vSAN™ is a mature software-defined storage technology for hyper-converged solutions. Uniquely embedded in the hypervisor, vSAN™ delivers high-performance, flash-optimized, easily-scaled hyper-converged storage for any virtualized application. vSAN™ cluster server with attached flash devices and/or hard disks provides highly-resilient shared data store for a variety of workloads, including business-critical applications, virtual desktops, remote IT, DR, and DevOps infrastructure.

High Performance

Total cost of ownership (TCO) has been highly emphasized in the modernized data center. Apart from electricity, space, and maintenance cost, performance is all what organizations concern. When designing "IOPS Optimized SKU", QCT was looking for transactional performance improvements in comparison with mid-range hardware configurations. To confirm the engineering work results, QCT selected MS SQL Server database and OLTP workload to run performance test. HammerDB, a popular tool with simplified version of TPC-C industry standard benchmark, was used to generate workload and measure performance, and to simulate OLTP workload. Six virtual machines were deployed with MS SQL Server instances and each served two OLTP database schemas. The database schema was populated with 5000 warehouses. To get more reliable test result, test time was extended from common 1-2 minutes to 20 minutes with 5-minute ramp-up time. Three-node cluster used for the test delivered 38.9 million transactions per minute (TPM) and 4.2 million new orders per minute (NOPM).

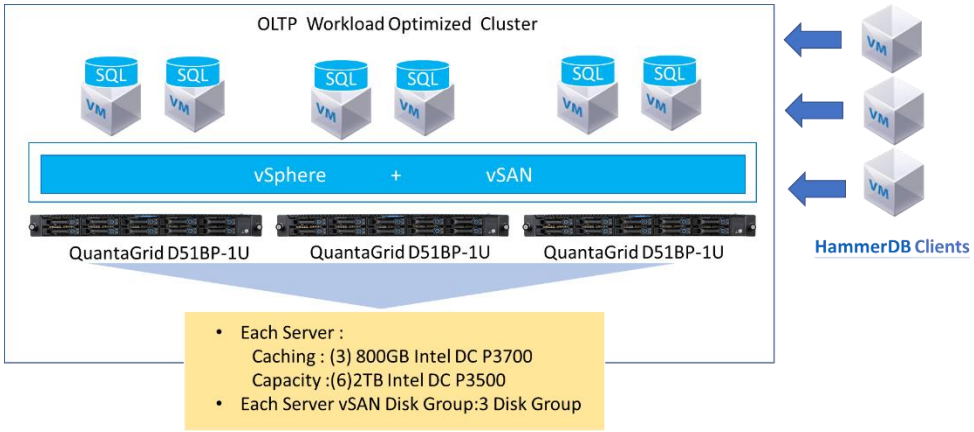

Figure 1. Solution Architecture.

Table 1. Test Result.

MS SQL Server Instance	TPM / Transactions per Second	NOPM / New Orders per Minute
MSSQL VM - 1	5,961,302	648,078
MSSQL VM - 2	7,103,576	788,552
MSSQL VM - 3	7,168,425	783,897
MSSQL VM - 4	5,956,102	635,413
MSSQL VM - 5	6,351,208	690,389
MSSQL VM - 6	6,386,957	693,327
Total	**38,927,570**	**4,239,656**

Table 2. Hardware Configuration.

Component	Description	Quantity
System	QuantaGrid D51BP-1U	3
CPU	Intel E5-2699 v4 @ 2.20 GHz	6
DIMM	RDIMM DDR4 32GB	60
SSD Cache	Intel SSD DC P3700 Series; 2.5in PCIe 3.0 800GB	9
SSD Data	Intel SSD DC P3500 Series; 2.5in PCIe 3.0 2TB	18
Boot Disk	32GB SATA DOM	3
NIC1 (Management)	S2BP ON 10G LAN/B 82599ES W/BKT(1 IN 1)	3
NIC2 (vSAN)	Intel XL710-QDA2 40Gb/s XL710QDA2G2P5	3

Table 3. Software Versions.

QuantaGrid D51BP-1U- BIOS 2A11
VMware vSphere 6.5d
VMware vCenter Server Appliance 6.5.0-5318154
VMware ESXi, 6.5.0, 5310538
VMware vSAN 6.6
MS SQL Server 2014 SP2
MS Windows Server 2012 R2
HammerDB v2.23

Conclusion

IOPS-optimized hyper-converged solution leverages QuantaGrid series server with discreetly selected components. Together with virtualization software from VMware, it makes a valid choice for MS SQL Server.

The test result reveals that IOPS-Optimized SKU, the high-end hardware selection, delivers exceptional performance with an ability to handle long-lasting peaks of the MS SQL database load.

For further inquiry, please visit http://go.qct.io/solutions/