

Intel Select Solution- Performance Optimized SKU For VMware vSAN™ Version2

Ultra-performance with Selected Hardware and Brilliant Testing Result



Benefits of Intel Select Solutions

- **Simplify Modernization**
Pre-defined, workload-oriented solutions simplify and expedite data center modernization.
- **Workload-Optimized Performance**
Based on the latest Intel technologies to provide an accelerated, simplified path to maximize overall performance.
- **System-level Benchmarking and Verification**
Ensure workload-optimized performance for complex data center applications with pre-defined settings and rigorous system-wide tuning.

Benefits of QCT Performance Optimized SKU

- **Simplify Modernization**
Reduce time to evaluate, select, and purchase necessary hardware components.
- **Accelerate time to value**
Minimize time to deploy new infrastructure.
- **Ensure the performance in business-critical scenarios**
Pre-optimized the setting parameters for business common use cases to reach outstanding performance.

INTRODUCTION

Enterprises around the world are facing drastic information explosion. To address this challenge, they must adjust their data center operations to embrace new business models. The software-defined data center responds to market demands by helping organizations excel with simplified management, agility, and lower total cost of ownership (TCO). However, hundreds of marketplace solutions complicate selection, adding to the burden of cost, installation efforts, and performance tuning.

To help customers and partners accelerate their data center transformation, Quanta Cloud Technology (QCT), a global data center solution provider, is leading provider of **Intel Select Solutions**. Intel Select Solutions provide rich system solutions for the forward thinking, agile data center. Intel Select Solutions fulfill diverse scenarios in data center use cases including virtualized infrastructure, database, NFVI, and hybrid cloud. Developed by Intel and solution partners, Intel Select Solutions is based on the latest Intel technologies to provide an accelerated, simplified path to maximize overall performance. The pre-defined and workload-oriented solutions in the program simplify and speed up the data-center modernization process from evaluation and procurement to integration and deployment. Furthermore, with pre-defined settings and rigorous system-wide tuning, the Intel Select Solution establishes performance thresholds for different workloads to ensure reliable, workload-optimized performance for complex data center applications. VMware and Intel have created a second version of Intel Select Solutions in 2019 for VMware vSAN™ that goes beyond the capabilities of the prior-generation of Intel Select Solutions for VMware vSAN™ by facilitating performance for memory-constrained workloads specifically.

QCT collaborates with Intel to provide a ready-to-use software-defined data center solution - **Performance Optimized SKU**, adopting 2nd Gen Intel Xeon Scalable processors which surpasses previous physical design limitations and offers high performance and energy efficiency. QCT Performance Optimized SKU simplifies modernization by reduce time to evaluate, select and purchase necessary hardware components. It also minimizes your time to deploy new infrastructure. Besides, pre-optimizing the setting parameters for business common use cases such as E-commerce or scalable web scenario to reach outstanding performance and exceed Intel Select Solutions threshold. Furthermore, the components in this all-NVMe configured platform are carefully selected by QCT which boosts the performance to a new level and makes it a qualified choice for partners or customers to construct a software-defined data center and stay in the lead.

ARCHITECTURE

Solution Architecture

In Intel Select Solution for VMware vSAN, QCT collaborates with Intel to provide a total solution for software-defined data center transformation- **Performance Optimized SKU**. As shown in Figure. 1, **Performance Optimized SKU** is composed of QCT's well-designed 2nd Generation server platform and market-leading virtualization software developed by VMware, delivering a reliable and confident choice for customers.

This solution addresses the common business challenges that CIOs face today in data centers such as insufficient resource utility, management inefficiency, reliability issues, and daunting process of deployment and tuning.



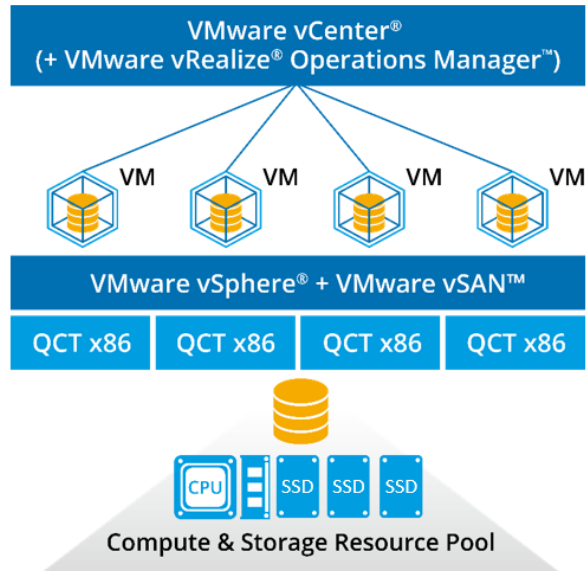


Figure 1. Solution Architecture of Performance Optimized SKU.

Hardware Architecture

QuantaGrid D52B-1U server features both extreme storage density and compute power for the hyper-converged solution. The hardware configuration in this solution brief is designed to fulfill Intel Select Solutions requirements as shown in Table 1. In this design, each server uses two Intel Xeon Gold 6252 CPUs with total 48 cores for compute and storage services. Each node uses 384GB memory capacity. Each host contains two NVMe Intel Optane SSD DC P4800X (375GB) for cache tier and four NVMe Intel SSD P4510 for the capacity tier under vSAN™ architecture, as shown in Figure. 2. Each QuantaGrid D52B-1U host contributes its local disks to a vSANDatastore and the disks are organized into two disk groups. A disk group can be seen as a “fault domain.” Generally, if the cache device fails, all HDDs and SSDs in the same disk group will be impacted. However, the design of multiple disk groups can highly reduce the impact when cache device fails on overall disk group, it can improve performance as well.

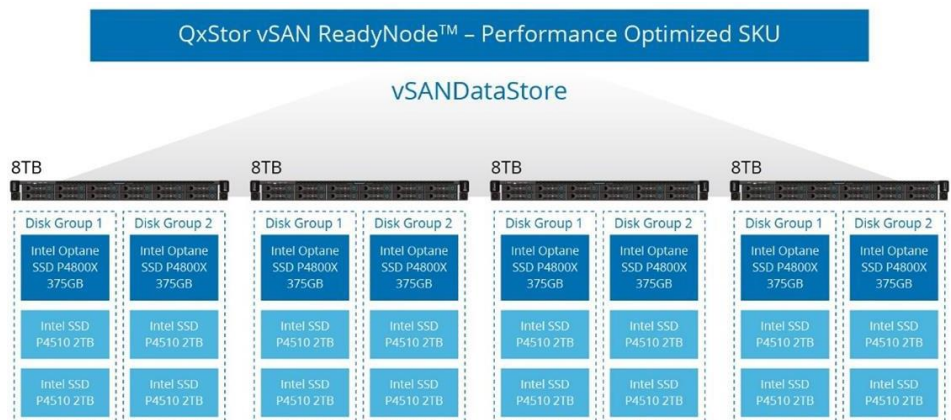


Figure 2. vSANDataStore Configuration of Performance Optimized SKU.

Table 1. Hardware Configuration of Performance Optimized SKU.

Components	Details	QTY
System	Model: QuantaGrid D52B-1U System Type: Rackmount	1
CPU	Intel Xeon Gold 6252 CPU @ 2.10 GHz / 48C/96T	2
Memory	32GB 2666MHz 288-pin DDR4 RDIMM	12
Caching Tier	Model : Intel SSD DC P4800X Series SSDPED1K375GA (375 GB, AIC) Partner Name: Intel Device Type: NVMe Capacity: 375 GB Performance Class: Class F: 100,000+ writes per second TBW Endurance Class: Endurance Class D >=7300 TBW	2
Capacity Tier	Model : Intel SSD DC P4510 Series SSDPE2KX020T8 (2 TB, 2.5-inch) Partner Name: Intel Device Type: NVMe Capacity: 2000 GB Performance Class: Class E: 30,000-100,000 writes per second TBW Endurance Class: Endurance Class B >=1825 TBW	4
NIC	Model: Intel Ethernet Network Adapter XXV710-DA2 25GbE	1
Boot Device	Model: SSD DC S4500, 480GB	1

Test result

In today's data center, more and more enterprises adopt virtualization technology. With virtualization technology, enterprises benefit from flexibility and scalability. VMmark® is a benchmark tool provided by VMware to evaluate the performance and scalability of virtualization platforms. It consists of two main workloads including applications and infrastructure operation behaviors to evaluate the overall system performance. VMware defines three subworkloads to simulate the applications including standby system, scalable web simulation, and E-commerce simulation, using the number of tiles and the aggregation score as measurement.

Tile

Tile is a unit in VMmark® which contains nineteen virtual machines to simulate a collection of diverse workloads. Each tile includes a scalable web, E-commerce, and standby system running on different virtual machines. The tile consumes either compute or storage resources when running the benchmark test. Each application or infrastructure workload generates its relevant performance metric after the benchmark tool finishes the tests. The performance metric in each workload should meet the minimum quality-of-service to make the result compliant when another tile is added. The total number of tiles can help administrators to evaluate the overall performance and the number of virtual machines on a virtualization platform.

Score

VMmark® collects performance metrics with diverse workloads and normalizes the score based on a reference system provided in [SPEC](#). When the test is finished, VMmark® generates an overall score to be compared with different virtualization platforms. The score is calculated based on a weighted average of the application and infrastructure workload. It gives 80% weights to the application workload and 20% to the infrastructure workload. When VMmark® runs multi-tiles,

an aggregation score is reported by accumulating individual score in each tile. For more information, please refer to [VMmark® User's Guide](#).

To reach an outstanding performance, QCT cooperates with Intel to optimize the setting parameters by adopting Intel Select Solutions base configuration. The test result shown in Figure 3 reaches up to 9 tiles and the aggregation score of 8.24 running on the four systems. Each tile contains standby system, scalable web simulation, and E-commerce simulations. Also, the aggregation score dramatically exceeds the Intel Select Solutions expected performance threshold. For the more details, please refer to [QCT VMmark® test result](#) published on VMware VMmark® website.

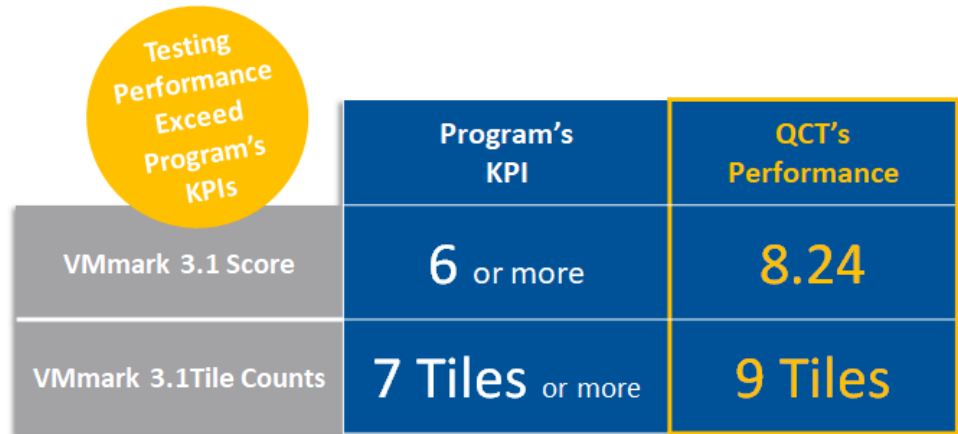


Figure 3. Testing Performance of Performance Optimized SKU.

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Conclusion

Performance Optimized SKU is a high-performance data center solution that is rapidly deployed, easy to manage, rigorously certified, and fully integrated into the industry-leading software-defined storage, vSAN™. This solution brief has shown that the outstanding performance of the solution surpasses the specific threshold in Intel Select Solutions program. This solution can minimize customers' time and expense in evaluation, selection, deployment and tuning of a solution.

With the knowledge of QCT and Intel, customers can leverage the collective results and have a simplified path to future-defined data center by adopting this solution.

QCT always stay innovative. QCT appreciates any feedback from you. For further inquiry, please visit <https://go.qct.io/solutions/qct-premier-intel-select-solutions/qxstack-vsan-readynodetm-performance-optimized-sku/>

ABOUT QCT

Quanta Cloud Technology (QCT) is a global data center solution provider. We combine the efficiency of hyperscale hardware with infrastructure software from a diversity of industry leaders to solve next-generation data center design and operation challenges. QCT serves cloud service providers, telecoms, and enterprises running public, hybrid and private clouds. Product lines include hyperconverged and software-defined data center solutions as well as servers, storage, switches and integrated racks with a diverse ecosystem of hardware components and software partners. QCT designs, manufactures, integrates and services cutting-edge offerings via its own global network. The parent of QCT is Quanta Computer, Inc., a Fortune Global 500 corporation. <http://www.QCT.io>



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