SOLUTION BRIEF

SUPERMICRO DEMONSTRATES RECORD PERFORMANCE FOR HYPER-CONVERGED INFRASTRUCTURES

CloudDC Systems Show High End Performance for Modern HCI Environments

Supermicro CloudDC Server - AS-1115CS-TNR

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Executive Summary

IT organizations are pressured to modernize, simplify operations, and lower risks. With a hyper-converged infrastructure (HCI) solution, scaling out, streamlining the deployment, and automating operations is more manageable.

VMware vSAN and Supermicro servers CloudDC is the perfect hyper-converged infrastructure with turnkey software-defined solutions for any workload. This joint solution provides a simple evolution to full-stack HCI, the broadest flexibility, and multi-cloud capability. You can use pool

storage capability, automatically provision VM storage, and dynamically scale performance and capacity as needed. This reduces the TCO drastically, improves storage efficiency, and scales your hybrid cloud.

Best in Class

To allow accurate and reliable vSAN performance power consumption, more than 200 published benchmark results have been peer reviewed. The Supermicro single socket CloudDC server currently holds the world record for performance and scalability on peer reviewed VMmark 3.1 results, running 648 virtual machines in a 4-node cluster. Compared to VMware's score standardized for VMmark applications. Supermicro's CloudDC platform is the fastest by 19.4%. Regarding infrastructure, Supermicro servers outperform VMware's standards by 15% for vMotion workloads, 67% for storage vMotion, 22% for combined vMotion and Storage vMotion, and 88% for deploying new virtual machines. For details on the benchmark, please visit VMmark 3.1.1 on Supermicro AS-1115CS-TNR.

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Supermicro System	Performance @ Tiles	Number of Hosts	Total Number of Sockets	Total Number of Cores (all hosts)
AS -115CS-TNR	35.20@36	4	4	384

VMware vSphere Distributed Service Engine

VMware vSphere Distributed Service Engine (vDSE) improves the performance and security of virtualized environments.

Data Processing Units (DPUs) are specialized hardware components that offload tasks from the CPU. vDSE replies on DPUs and offloads tasks like networking and security. It also significantly improves the performance of virtual machines and containers, leading to lower latency and higher data throughput. vDSE can also be used to implement security features like firewalls and intrusion detection systems on the DPU. These features can help to improve the overall security of your virtualized environment.

VMware Lifecycle Management

VMware Lifecycle management offers a holistic approach to managing virtualized infrastructure, providing organizations with the tools and capabilities needed to optimize performance, security, and efficiency while reducing operational costs and mitigating risks. With VMware lifecycle management, you can update Supermicro firmware without entering maintenance mode.

VMware lifecycle management streamlines the process of deploying, updating, and managing virtualized environments. Automated workflows and centralized management tools reduce manual intervention, save time and effort and help mitigate risks associated with system downtime, data loss, and security breaches. Centralized management and policy-based controls enhance security by enforcing consistent security measures across virtualized environments. This includes access controls, encryption, and compliance auditing to protect against security threats and ensure regulatory compliance.

- vSphere Lifecycle Manager can stage update payloads to the hosts in advance of remediation.
- Staging can be performed without maintenance mode.
- Firmware payloads can also be staged with integration from a supported Hardware Support Manager.

VMware VMmark Benchmarks

VMmark is an industry-standard tool used by hardware vendors to measure virtualization platforms' performance, scalability, and power consumption. VMmark 3.1 generates a realistic measure of platform virtualization performance by incorporating various infrastructure workloads in addition to the traditional application-level workloads. VMmark can simulate scalable web services or E-commerce applications.

Server Configuration Notes

These settings are to get the CPU to its highest power state.

- Under Advanced Menu Tab -> CPU Configuration -> Global C-state Control was changed to "Disabled." (Default: Global C-state Control = Auto)
- Under Advanced Menu Tab -> CPU Configuration -> L2 Stream HW Prefetcher Set to "Disabled". (Default: L2 Stream HW Prefetcher = Auto)
- Under Advanced Menu Tab -> NB Configuration -> TDP control changed to "Manual" and set TDP to "400". (Default: TDP Control = Auto)
- Under Advanced Menu Tab -> NB Configuration -> Package Power Limit Control set to "Manual" and Package Power Limit set to "400". (Default: Package Power Limit Control = Auto)
- Under Advanced Menu Tab -> Determinism Control Set to "Manual" and Determinism Enable set to "Disable Performance Determinism." (Default: Determinism Control = Auto)

Networking Notes

- Single Distributed Switch with one uplink at vmnic0.
- Uplink1 contains the following distributed portgroup: Management Network, VM Network, VM Network2, vMotion, and vSAN.
- vLAN ID 1006 consists of the vSAN network.
- All other port groups are on VLAN ID 1007.
- VM Network2 is untagged but native to VLAN ID 1007.
- MTU of DSwitch, vmnic0, vmk0, vmk1, and vmk2 set to 9000.
- Client VM uses VM Network 2, and all other VMs use VM Network.

System Configuration:

Items	Configuration
Server model	Supermicro AS-1115cs-TNR
Processor	AMD EPYC™ 9654P, one socket / 96 Cores/ 192 Threads 2.4GHz /3.7GHz Turbo
Memory	12 x 128GB 4Rx4 DDR5-4800 MHz RDIMM
Network	Cisco Nexus 31108TC-V 100Gb/s
Storage	VMware vSAN 8.0 U1 ESA: 6x Intel 6.4TB P5620 2.5” NVME

Test Results:

In the 1024k test, Supermicro achieved 60Gb/s read in the total cluster while keeping 1 ms latency. Each server ran two virtual machines with 2 VMDK each. Each disk ran two threads of FIO.

During our 4k testing, we achieved 1.33 million IOPS in a cluster. Each server had eight virtual machines running ten vmdk each. Each vmdk ran four threads of FIO. The average latency was around 1 ms. Details check VMmark 3.1.1 on Supermicro AS-1115CS-TNR.

Conclusion

Supermicro CloudDC servers using AMD EPYC processors deliver consistently high performance for VSAN deployments. Supermicro has designed performance-optimizing. For more information, please visit www.supermicro.com.

For More Information:

https://www.supermicro.com/en/products/clouddc

SUPERMICRO

As a global leader in high performance, high efficiency server technology and innovation, we develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, HPC, and embedded markets. Our Building Block Solutions® approach allows us to provide a broad range of SKUs and enables us to build and deliver application-optimized solutions based upon your requirements.