



Hyperconverged Infrastructure and High Performance Networking Applied to Virtual Desktop Infrastructure (VDI)

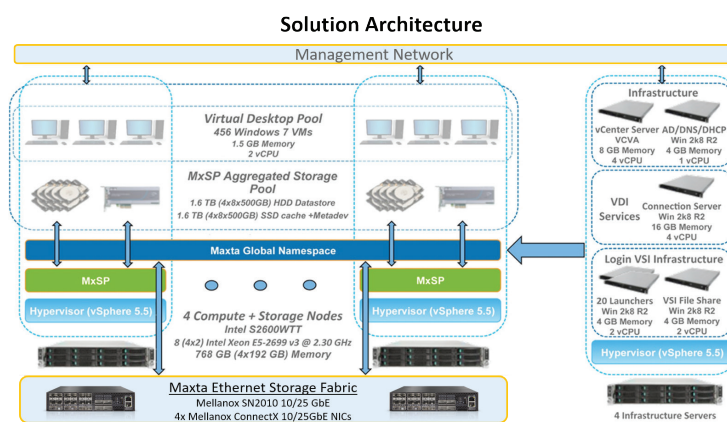
EXECUTIVE SUMMARY

The Maxta® Hyperconverged Infrastructure (HCI) solution is a hypervisor-agnostic, highly resilient storage platform for the virtual data center. It turns standard servers into a converged compute and storage solution, leveraging server-side flash and spinning disks to optimize performance and capacity. Maxta's distributed architecture enables shared storage with VM-level enterprise-class data services and full scale-out capability without performance degradation, resulting in significant cost savings, as well as dramatically simplifying IT. Mellanox Ethernet Storage Fabric (ESF), consisting of Mellanox Spectrum switches and ConnectX network adapter cards, simplifies the deployment and management of high-speed networking in the datacenter. Mellanox switches deliver unmatched density in a unique form factor and port count making them the ideal choice for hyper-converged solutions. Mellanox Switches, based on Spectrum ASIC, provide a flexible configuration of 10/25/40/50/100GbE ports in an industry first half rack width form factor. This allows for a compact yet fully redundant 1RU networking solution.

MAXTA HYPERCONVERGED INFRASTRUCTURE (HCI)

Maxta's innovative, peer-to-peer architecture aggregates storage resources from multiple servers, incorporating a global namespace and creating a Maxta storage pool. An instance of MxSP™ software is installed on each of the servers that are part of the virtualization cluster. The software leverages flash storage resources for performance and HDDs for capacity.

The Maxta solution delivers a good end user-experience and better performance than traditional storage for VDI workloads by leveraging flash media as cache. Maxta's zero-copy snapshots and clones are highly beneficial



Linear Scalability / Consistent Performance / Ease of Deployment

for administrators who have to deploy thousands of virtual desktops in minutes. The snapshots and clones are also time-, performance-, and capacity-efficient, meaning that they can be created and deleted instantly, have no impact on performance, and do not take up any space on creation.

The Maxta solutions also provide organizations the choice to deploy hyper-convergence on any x86 server, use any hypervisor, and any combination of storage devices, allowing organizations to exploit the potential of VDI deployments. The simplicity of Maxta's VM-centric solution reduces IT management to further maximize cost savings. Hyper-scale, enterprise-level data services, and capacity optimization empower organizations to hyper-converge, eliminating the need for SAN or NAS devices.

MELLANOX ETHERNET STORAGE FABRIC (ESF)

The Mellanox Ethernet Storage Fabric provides a simple, efficient and high-performance end-to-end network fabric for modern data centers and clouds. Built on the best-in-class switching ASIC, Mellanox Spectrum™ switches are modern switches with a rich set of Layer 2/3 features and deliver line-rate throughput and ultra-low latency at any speed with zero packet loss. In particular, the Mellanox SN2010 Top-of-the-Rack (ToR) switch delivers fully redundant, highly dense, low latency and energy efficient networking infrastructure at a competitive price. The SN2010 is a 1U half width form factor switch, which provides 18 native SFP+/28 10/25GbE interfaces for server connectivity, and 4 QSFP+/28 40/100GbE interfaces for uplinks and MLAG between two SN2010s for HA. The compact, enterprise-class switch design with right switch ports for Maxta HCI optimizes the efficiency and reduces networking CapEx and OpEx. Mellanox ConnectX network adapter cards, with 10/25/40GbE connectivity and hardware offloads of network protocols and RDMA, provide the highest performing and most flexible interconnect solution used in public and private clouds, enterprise data centers and high-performance computing.

CONCLUSION

The joint Maxta and Mellanox solution presented in this paper provides significant cost, management, and performance improvements in a VDI environment. Rapid creation of Maxta clones into a virtual desktop pool makes the deployment process quick and pain-free. The four node configuration supports 456 virtual desktops while maintaining high levels of performance without saturating the network. Mellanox SX1012 offers unmatched density in 1RU, while still delivering low latency and low power consumption of 55W per switch. The solution is fully fault tolerant and offers flexible connectivity options.

VDI Metrics

4 Minutes Deploy 456 Maxta Clones		Rapidly deploy virtual desktops
VSImax v4.1 average: 995 ms 456 user sessions Saturation point (VSImax v4.1) not reached		Faster application response times than industry average
8 minutes Recover 100 desktops after host failure		Support for HA minimizes system downtime
33.97% peak Network usage 10 GbE private storage network		Network bandwidth provides room to grow

Maxta Storage Platform (MxSP)			
Number of Desktops	100	300	456
Number of Nodes (ESXi hosts)	2+1*	3	4
Number of stuck or unresponsive desktops (Sessions)	0	0	0
Controller VM configuration (CVM)	4vCPU/8GB Memory	4vCPU/8GB Memory	4vCPU/8GB Memory
Performance Metrics			
Minimum response time (VSIBase)	731 ms	797ms	843 ms
Average response time (VSImax Average)	823 ms	929 ms	995 ms
Maximum response time (VSImax Threshold)	1731 ms	1798 ms	1844 ms
Network Usage	2.33%	10.61%	33.97%

* 2 Hyper-Converged Compute/Storage Nodes + 1 Compute-Only node

About Maxta

Maxta maximizes the promise of hyper-convergence. MaxDeploy™ Appliances and MxSP software solutions provide companies the choice to hyper-converge on any x86 server, the ability to run on any compute abstraction layer, and the flexibility to support any combination of storage devices eliminating the need for complex and expensive storage arrays. The simplicity of Maxta's VM-centric solutions reduce IT management and lowers cost, all while delivering hyper-scale, enterprise-level data services and capacity optimization. With Maxta, service providers and enterprise customers can build private and public clouds based on any cloud orchestration software. Think outside the storage box. For more information, visit www.maxta.com.

About Mellanox

Mellanox Technologies is a leading supplier of end-to-end InfiniBand and Ethernet interconnect solutions and services for servers and storage. Mellanox interconnect solutions increase data center efficiency by providing the highest throughput and lowest latency, delivering data faster to applications and unlocking system performance capability. Mellanox offers a choice of fast interconnect products: adapters, switches, software, cables and silicon that accelerate application runtime and maximize business results for a wide range of markets including high-performance computing, enterprise data centers, Web 2.0, cloud, storage and financial services.

To find out more, visit our website: www.mellanox.com