

Most Efficient Windows Azure Pack based Cloud over Mellanox End-to-End Interconnect Solutions

Introduction

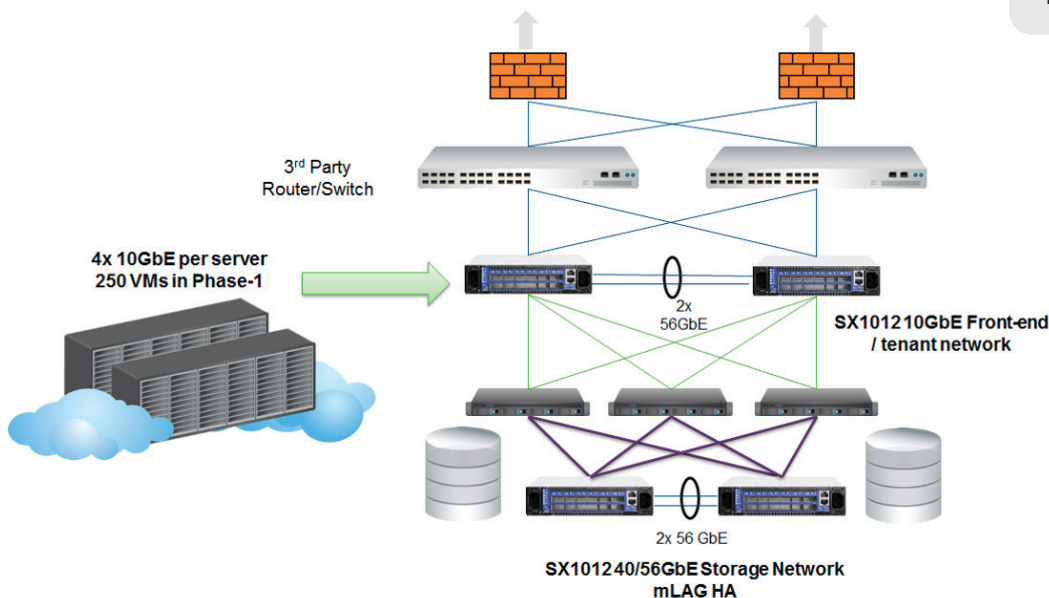
MHA Cloud Computing in New Zealand is a key provider of high performance managed services and hosted infrastructure to medium sized businesses.

MHA recently joined the Microsoft Cloud OS Network and has ventured into the deployment of a new Azure compatible hosting platform. With this platform, MHA is providing an Azure Pack based Hybrid Cloud solution that meets the demands of medium-to-large customers who are either at capacity or require a development/test environment at the best possible price/performance. Some of the key offerings of MHA Cloud include Virtual servers, Web applications, virtual networking with NVGRE, DBaaS, and Azure-enabled backup solutions.

The platform consists of high density compute and software-defined storage via the use of Windows Server 2012 R2 Storage Spaces over SMB Direct (SMB 3.0 over RDMA), that utilizes RoCE capabilities with Mellanox Ethernet switches, NICs and cables. The presented solution demonstrates how Mellanox end-to-end interconnect solution is used to cater higher efficiency networking, to both, to the compute servers as well as to the software-defined storage servers, over 40/56GbE.

“We only needed less than 10 ports per switch, so Mellanox SX1012 was ideal for us: half the size, while enabling both the 10GbE front-end tenant network and the 40/56GbE back-end storage network at a great price. In addition, the benefits of RoCE enabled us to do more with the gear we’re buying.”

Buddy Davies,
MHA Cloud Computing



Solution

Primarily, the storage networking is based around Microsoft Software-Defined Storage, consisting of 3x file servers equipped with Mellanox's ConnectX-3 Pro 40GbE NICs and 12GB SAS HBAs connected with multiple paths to 3x 90-bay JBODS with a mixture of Near-line HDD and HGST SSD for tiering. On top of the hardware, MHA Cloud runs Microsoft Server 2012 R2 with clustered Storage Spaces over SMB Direct and the Scale-Out File Server Role installed for an active-active and highly available platform.

In this solution, MHA Cloud features the RDMA and NVGRE offload capabilities of Mellanox NIC and switching hardware to achieve unprecedented storage performance with Microsoft Storage Spaces Direct over a 40GbE network. Mellanox switches are also configured in mLAG for high-availability for both tenant and storage network.

Hardware Used by MHA Cloud

Compute

Clustered hosts, each with:

- Intel Xeon E5-2660 v3 processors
- 512GB 2133Mhz RAM
- SSD OS disks
- 4x ConnectX-3 Pro 10GbE NICs
- 1U chassis

Storage Nodes

3x clustered nodes

- Intel Xeon E5-2620 v3 processors
- 64GB 2133Mhz RAM
- 2x ConnectX-3 Pro 40GbE NICs (storage network)
- 2x ConnectX-3 Pro 10GbE NICs (tenant network)
- 2x LSI 4-port 12GB SAS HBA
- JBOD with HGST Enterprise 400GB SSDs
- SuperMicro SuperChassis 90-bay JBODs
- Seagate Enterprise Near-line SAS 4TB HDDs
- HGST Enterprise 400GB SSDs

Conclusion

Mellanox end-to-end 40/56GbE solutions enable private/public cloud providers to deploy infrastructure that has enterprise-class reliability and HPC-class performance at extremely low deployment costs. This allows solution providers to create differentiated offerings in the highly competitive 'X'aaS market space.



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