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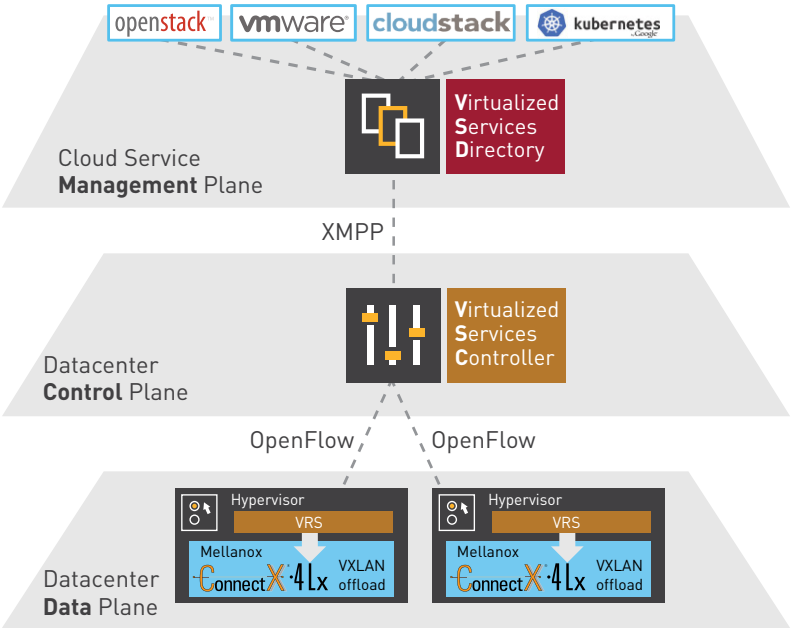
Partner Solution Brief

Accelerate Nuage Networks Virtualized Services Platform (VSP) with Mellanox VXLAN Offload

Solution overview

- Agile, elastic and secure SDN deployment with unconstrained, deterministic cloud network performance (10, 25, 40, and 50 Gb/s throughput to the server host)
- Enhanced cloud infrastructure efficiency and higher application workload density resulting from reduced CPU overhead associated with overlay virtual network processing
- Integrated and tested solution ready for Software Defined Data Center (SDDC), Network Functions Virtualization (NFV), and public, private and hybrid cloud deployments



Mellanox TECHNOLOGIES

Nuage Networks™ and Mellanox Technologies jointly provide an extremely efficient Software Defined Networking (SDN) solution, which combines the agility, elasticity and automation of the Nuage Networks Virtualized Services Platform (VSP) and the performance, reliability and efficiency of Mellanox interconnect, so you can deploy your cloud infrastructure with confidence.

SDN is a revolutionary approach to designing, building and operating networks; it delivers business agility while lowering capital and operational costs through network abstraction, virtualization and orchestration.

Nuage Networks VSP is a non-disruptive overlay SDN platform that realizes secure network virtualization without requiring a forklift hardware network upgrade. Virtual Routing and Switching (VRS) is the distributed forwarding module within VSP that serves as a virtual endpoint for network services. Through the VRS, changes in the compute environment are immediately detected, triggering instantaneous policy-based responses in network connectivity to ensure application performance.

As an overlay SDN solution, Nuage Networks VSP uses tunneling protocols such as VXLAN to encapsulate the original payload. For NICs that don't recognize these new packet header formats, even the most basic offloads stop functioning, which means that all packet-manipulating operations need to be done in software in the CPU. This can cause significant network I/O performance degradation and large CPU overhead, especially as server I/O speed evolves from 10 Gb/s to 25, 40, 50, or even 100 Gb/s. To reduce server I/O, overlay network processing needs to be offloaded to I/O hardware.

Starting from the ConnectX-3 Pro series of NICs, Mellanox supports VXLAN hardware offload, which includes stateless offloads such as checksum, RSS, and GRO for VXLAN/NVGRE/GENEVE packets. With VXLAN offload, I/O performance and CPU overhead can be restored to levels that are similar to those that are VLAN-based. The VXLAN offload feature is further enhanced in the Mellanox ConnectX-4 series of NICs, which supports a full range of new speeds including 25, 50 and 100 Gb/s.

Business benefits

Nuage Networks Virtualized Services Platform (VSP) is an open SDN platform for virtualizing datacenter networks using x86 hardware. Nuage Networks VSP is certified on the Red Hat Enterprise Linux OpenStack® Platform.

About Mellanox Technologies

Mellanox Technologies (NASDAQ: MLNX) is a leading supplier of end-to-end Ethernet and InfiniBand intelligent interconnect solutions and services for servers, storage, and hyper-converged infrastructure. Mellanox intelligent interconnect solutions increase datacenter efficiency by providing the highest throughput and lowest latency, delivering data faster to applications and unlocking system performance.

More information is available at:
www.mellanox.com
@mellanoxtech
Twitter and Facebook

Mellanox ConnectX®-4 Lx EN cards functional capabilities

- Speeds: 1/10/25/40/50 Gb/s
- Single and Dual port options
- Hardware offloads for VXLAN, NVGRE and GENEVE encapsulated traffic
- Erasure Coding offloading
- Multi-Host PCI-E interconnect option
- End-to-end QoS and congestion control
- Low latency RDMA over converged Ethernet
- OCP Specification v2.0 and v0.5 compliant options
- Hardware-based I/O virtualization

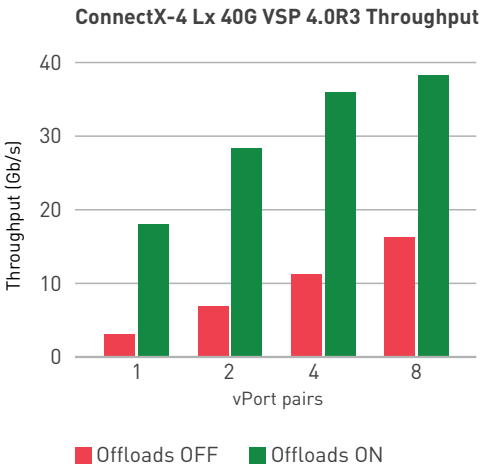
Solution features and benefits

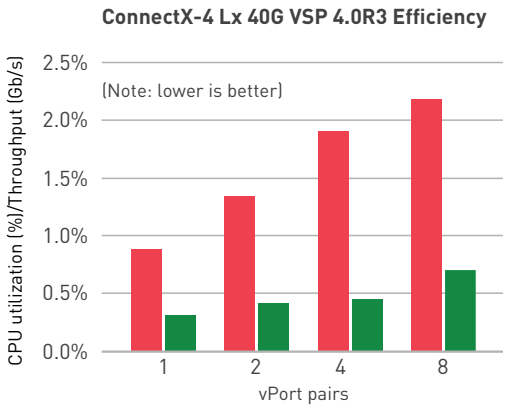
Unconstrained SDN network performance

Based on netperf TCP_STREAM benchmark results between virtual machines hosted on KVM, the Nuage Networks-Mellanox joint solution delivers near wire-speed throughput at 40 Gb/s, approximately a 100% enhancement compared with server I/O throughput without VXLAN offload. Related Linux bonded NIC tests with active backup show Mellanox controllers running Nuage Networks VSP are resilient against connection failures with minimal throughput and CPU impact.

Enhanced cloud infrastructure efficiency

By offloading virtual overlay network processing from the CPU to the NIC, CPU overhead is significantly reduced, empowering the infrastructure to support more application workload, thus improving cloud infrastructure efficiency.





Conclusion

Intelligent ConnectX-4 NICs from Mellanox Technologies enhance the total infrastructure efficiency of Nuage Networks SDN deployments substantially by offloading computationally intensive VXLAN packet processing operations, freeing costly compute resources to achieve higher application workload density.

About Nuage Networks

Nuage Networks strikes at the heart of the cloud networking challenge: Choreographing datacenter and wide-area networks to maximize responsiveness, utilization and visibility. Nuage Networks delivers a highly programmable infrastructure that bridges the gap between the application-centric view and the equally important network-centric view, realizing the full power of SDN. The Nuage Networks solution combines ground breaking SDN and virtualization techniques with unmatched networking expertise to deliver a massively scalable solution that consistently spans datacenters and remote locations. Our solution enables enterprise IT to respond instantly and securely to the demands of users and applications anywhere.

Discover more at www.nuagenetworks.net and follow us @nuagenetworks

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