

SCI StorInt™ Dispatch – Cisco080225

Announcing: New Nexus 7000 Series data center class switch

Cisco announced the Nexus 7000 Series switch in January and did an analyst briefing in late February.

Nexus 7000 next generation switch

This is Cisco's 10Gbe data center core switching architecture supporting unified fabric services for FCoE, IP, HPC and Ethernet. Also, the Nexus 7000 supports enterprise class servicing including non-disruptive code load as well as graceful routing of packets around planned network switch outages.

Unified fabric FCoE, IP, HPC, Ethernet

FCoE is still being defined in standards bodies and won't be ratified until later this year. The T11 sub-committee working on FCoE requires 10Gbe and lossless Ethernet switching capability. As you may recall FC protocol is a truly "loss-less" protocol whereas Ethernet has been designed around a "lossy" protocol providing quick recovery for dropped (lost) packets. Dropped packets incur added performance overhead and an inherently non-deterministic packet transit time. By implementing lossless Ethernet today the Nexus 7000 is ready to support FCoE when ratified.

Nexus traffic over FCoE will need to terminate at standard MDS 9500 switches that can translate FCoE to standard FC protocol to talk directly to storage devices. Servers will ultimately use FCoE directly eliminating the need for FC HBAs.

True unified fabric may need to await FCoE ratification but today Cisco SFS infiniband switches support a unified fabric through infiniband to FC gateways, infiniband to Ethernet gateways and support infiniband HPC switching directly.

10Gbe now, 40-100Gbe ready

The Nexus system is a high density switching architecture with a 32 port 10Gbe and 48 port 10|100|1000 Ethernet blades using 8 blades per unit and two units per system. Each blade adds switch throughput and in aggregate can support 15Tb/s switch throughput. Cisco states this high-density switching architecture is 40 and 100Gbe ready.

Server virtualization readily consumes all available port bandwidth and as such is driving the need for higher bandwidth links across the data center. Cisco has responded by aggressively rolling out 10Gbe. In contrast, Brocade uses both 10Gbe and 8Gb/s fibre channel to address this rising demand (See SCI StorInt™ Dispatch Brocade080122-010.pdf.) Both will work and with Microsoft pushing their own server virtualization, the need for more port bandwidth will grow even faster.

Network virtualization

Nexus 7000 supports a virtualized control and data plane that allows for VLANs, Virtual Route Forwarding (VRF), and Virtual device context (VDC).

- VLANs allow for virtual isolation of bridge domains.
- VRF provides for virtualized forwarding and routing tables.
- VDC provides for virtualizing the physical switch itself presenting the switch as multiple logical devices.

Nexus also supports standard storage area network intelligent fabric services using MDS FC switches.

Announcement significance

Cisco's is making another big bet, this time on the FCoE protocol and 10Gbe to be the unified fabric of the future. Also Cisco has already rolled out infiniband as another unified fabric. Alternatively, Brocade has placed bets on 8Gb/s FC and 10Gbe for their unified switching. Both companies will be watching the market place to see which becomes dominant.

The Nexus 7000 is a major platform change for Cisco, which includes a new branded NX-OS as well as new hardware platforms. Future versions of Nexus hardware will be targeted to other switching hardware configurations.

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