10GBASE-T Joint Cisco Intel and Panduit Demonstration

Technology market leaders Cisco®, Intel® and Panduit® have brought together their latest innovations to demonstrate a 10GBASE-T (IEEE 802.3an standard) solution at Cisco Live 2010. This demonstration showcases how 10GBASE-T technology can be used to support the deployment of virtualized environments that help consolidate server workloads and reduce data center footprints.

10GBASE-T is the next evolution of the existing 1 Gigabit Ethernet Copper technology and provides a ten-fold increase in network I/O bandwidth. It shares many of the same deployment characteristics as that of its predecessors – it uses the well-understood RJ45 connectors and leverages the existing twisted pair copper-cabling infrastructure. In addition, the multi-rate capabilities on the 10GBASE-T network adapters provide a gradual upgrade path towards adopting this new technology.

The demo solution features

- Cisco® Catalyst® 6500E series Switches with a 16-port 10GBASE-T Line Card
- Cisco® Catalyst® 4900M Series Switches with a 8-port 10GBASE-T Line Card
- Quad-Core Intel® Xeon® Processor-based servers running VMware ESX 4.0
- Cisco® Nexus® 1000V Switches
- Intel® AT2 10 Gigabit Ethernet Server Adapters with support for Virtual Machine Device Queues (VMDq)
- Panduit TX6A™ 10Gig™ Copper Cabling System with MaTriX Technology

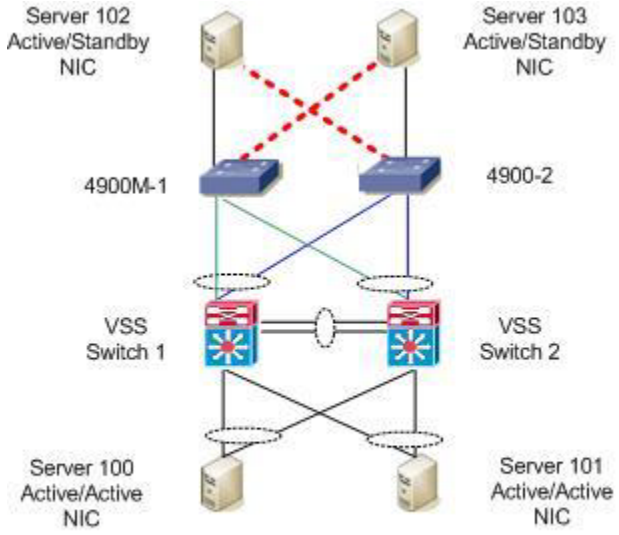

Figure 1: Demonstration Diagram

Demonstration Setup

As shown in Figure 1, the demonstration connects two (2) Quad-Core Intel Xeon processor-based servers to two (2) separate Cisco Catalyst 6500 E-Series switches configured with a single 16-port 10GBASE-T line card in each switch. In addition, the demo also connects two (2) additional Quad-Core Intel Xeon processor-based servers to two (2) separate Cisco Catalyst 4900M Series switches configured with a single 8-port 10GBase-T line card in each switch. Each of the four (4) servers is configured with VMware ESX 4.0, Cisco Nexus 1000V switch and consists of two (2) Intel AT2 10 Gigabit Ethernet Server Adapters with support for VMDq.

The Catalyst 6500 E-Series switches represent an End-of-Row data center configuration whereas the Catalyst 4900M Series switches represent a Top-of-Rack data center configuration. Furthermore, the two (2) Catalyst 6500 E-Series switches are configured in a Virtual Switching System (VSS) configuration providing multi-chassis connectivity to both the downstream servers as well as to the upstream Catalyst 4900M switches. As a result, the two (2) servers that connect to the Catalyst 6500 E-Series switches are able to operate in an active-active NIC teaming mode while the remaining two (2) servers that connect to the Catalyst 4900M Series switches continue to operate in an active-standby NIC teaming mode.

Each of the four (4) servers is configured with eight (8) VMs each for a total number of thirty-two (32) VMs spanning the entire demo.

In order to generate traffic, the sixteen (16) VMs on two (2) of the four (4) servers are configured as transmit nodes with another sixteen (16) VMs on the remaining two (2) servers acting as receive nodes, with all of the thirty two (32) VMs running the NTttcp application as traffic generators and receivers.

A fifth server is used in the demo that runs VMware vCenter™ server.

All of the physical 10GBase-T links are operating over Panduit® TX6A™ 10Gig™ Copper Cabling System channels in a QuickNet™ pre-terminated configuration.

Demonstration Test

On each VM, the NTttcp application is configured to use 64KB buffers segmented into standard 1500 Byte packets and sends four (4) unique streams to a corresponding VM on the receiving ESX 4.0 nodes.

Demonstration Results

Using the VMware esxtop tool on the ESX 4.0 servers, we are able to observe a network throughput of over 9Gbps on each of the four (4) servers.

Visit http://www.cisco.com/go/6500 for more information about Cisco Catalyst 6500 10GBASE-T line cards.
Visit http://www.cisco.com/go/4900 for more information about Cisco Catalyst 4900M 10GBASE-T line cards.
Visit http://www.cisco.com/go/intel and www.intel.com/go/ethernet for more information about Intel 10GBASE-T adapters.
Visit http://www.cisco.com/go/panduit and www.panduit.com/hsdt for more information about Panduit 10GBASE-T cabling technology.