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# Cisco Catalyst 4900M Helps Clear the Way to 10G

By Cameron Sturdevant

Cisco's newly minted Catalyst 4900M can help network engineers navigate the transition to 10G by offering a mixture of fixed and swappable, card-based ports.

As servers become more densely consolidated, and as the data sets that back-end applications are called on to process continue to swell, IT organizations must seek out strategies for transitioning their direct-to-server connectivity from 1 Gigabit to 10 Gigabit Ethernet.

Cisco's newly minted Catalyst 4900M can help network engineers navigate that transition by offering a mixture of fixed and swappable, card-based ports to provide administrators with the means to growing into 10G as the network I/O needs of their infrastructure expand.

The 4900M is a 2U (3.5-inch) form factor data center switch that's designed to sit atop a rack of servers, aggregate their traffic and uplink to an end-of-row switch such as a Catalyst 6500. The "M" in 4900M stands for modular, with the intention that 1G modules will be replaced with 10G modules as data center server network connections increase in bandwidth.

The 4900M, which is Cisco's first semifixed switch, divides its available

capacity between eight fixed, wire-speed, X2 format, 10 Gigabit Ethernet ports, and two half-slots that can accommodate a mixture of 10G and 10/100/1000 ports, in both full line rate and 2:1 oversubscribed flavors.

The Cisco switch began shipping in January and is priced starting at \$22,000, but as we learned by working with Cisco-certified reseller FusionStorm, the price you end up paying for the 4900M will vary greatly depending on the mixture of half-cards and transceivers you require, since those elements comprise about 70 percent of the hardware costs for the unit.

For IT shops that process video, CAD and other large-volume data projects, and especially those that have placed x86 server virtualization at the top of the priority list, should start planning now on how to accommodate the growth in individual server network capacity. For these shops, implementing equipment to bridge the 1G-to-10G gap in their architecture plans likely will become a necessity before long.

Based on my tests of the 4900M, which I had the opportunity to put through its paces at Ixia's iSimCity test and measurement center, Cisco's new switch deserves a spot near the

top of your data center equipment evaluation list. I tested the 4900M in a configuration with 16 10G ports running at full line speed.

I used an Ixia Optixia 12XM chassis to max out the 16 10G Ethernet interfaces. Layer 2 and 3 latency for packet forwarding for packets ranging from 64- to 9216-byte jumbo frames remained steady at ~2.6 microseconds with no transmit or receive errors. All tests were 5 minutes in duration and conducted at 100% and 10% utilization rates to search for buffer- and stress-related errors.

Just as impressive to me as the 4900M's performance was way it kept chugging along when I pulled one of the unit's AC power supplies (DC power supplies are expected to begin shipping in June) while the switch was running full tilt.

Because 10G to the server is still on the bleeding edge, there's plenty of innovation to go around. Last November, Arastra announced the 7148S, a 10G switch that Arastra claims to be the highest-density top-of-rack device available. Arastra has crammed 48 10 Gigabit Ethernet ports into a 1U (1.75-inch) form factor chassis. The 7148S uses SFP+ interfaces, compared to the larger and older X2 optical modules used in the Cisco 4900M. Arastra

wouldn't disclose pricing but claims to be holding to a target price per port that is only two to three times the cost of a 1G port.

## Networks in transition

The 4900M design and function is all about supporting a transition from 1G to 10G Ethernet in top-of-rack data center installations. Based on my tests with the 4900M, it's easy to see how this field-upgradeable unit will fit the transition bill.

There are three different half-cards available for the 4900M's two slots, a 20-port wire-speed 10/100/1000 RJ-45, a four-port wire-speed 10 Gigabit Ethernet X2, and an eight-port 2-to-1 oversubscribed 10 Gigabit Ethernet X2 card. What's more, the 2-to-1 oversubscribed card can accommodate Cisco TwinGig converter optic modules to provide up to 16 1G ports. This near-dizzying array of configuration choices boils down to enough flexibility to accommodate almost any transition plan

for servers that need to move from 1G to 10G network connectivity.

However, with the flexibility that this semifixed switch can provide comes added management responsibility. The capacity and function of a 4900M will vary broadly depending on the mixture of cards in place. For example, the maximum number of available ports could go from 46 (with two 10/100/1000 half-cards providing 40 1G ports, six available fixed 10G ports, and two uplinks for an end-of-row aggregation switch) to 14 (14 10G ports, again with two 10G uplinks).

I was able to use the Cisco IOS interface to keep track of which cards were deployed in my system without much trouble, but I found it invaluable to have a Cisco engineer at my disposal to assist in device configuration and setup. The show commands that are familiar to any Cisco-certified technician make it easy to see which cards are installed in the chassis.

Since most transitions to 10G will likely occur in a fairly predictable swell

as opposed to an overnight mandate, I see keeping track of where the variously configured half-cards are deployed as a management cost that must be factored in to the cost of deploying the 4900M in any data center. Senior network architects at your organization must pay heed to these inventory issues and ensure that half-cards are deployed in an efficient manner.

The half-card modules, power supplies and fan tray are all field-serviceable components and require only a screwdriver access. There is a CompactFlash slot for field-service switch image upgrades and two USB ports that also can be used to make a direct connection to the 4900M for field servicing if necessary. In addition, the 4900M has the usual console port along with a 1G NIC that can be connected to a management network for out-of-band management of the device.

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