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 REVIEW

Catalyst 3750 stacks up well

Cisco switch is robust, flexible, and moves the wiring performance bar up to 1Gbps

By **Oliver Rist**

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Look out, because Cisco is going gigabit. With 10Gig switches heading into the enterprise backbone at full steam and 10/100/1,000Mbps becoming commonplace in workstations and servers, Cisco has decided that Gigabit Ethernet's day has come. To prove it, the company has released its Catalyst 3750 line of stackable switches.

Although Cisco is positioning the Catalyst 3750 as a small-business- and even remote-office-oriented product, its new StackWise stacking architecture can supply plenty of horsepower for larger enterprises. The older GigaStack stacking technology used in the Catalyst 3550 line was worth only 1Gbps, hence its name; StackWise bumps that up to a whopping 32Gbps. Additionally, the 3750 supports IPv6, which means shops using that technology will be able to support any number of internal IP addresses.

Although there are other stackable 10/100/1,000Mbps products available today, Cisco's 3750 series brings a new level of maturity to copper, gigabit-capable stackables. A robust, embedded management capability is bolstered by modifiable configurations and, most important for steady performance, a stacking backplane architecture specifically designed for high-gigabit port counts.

StackWise allows you to stack as many as nine 3750s into a single logical routing unit. In this configuration, one unit acts as the master for management purposes and distributes the routing tables to all the other switches in the stack in case the master or any other switch in the stack should fail. In that case, another master takes over by default, alarms are issued, but routing continues uninterrupted.

Stack nine of these guys, and you can hook up 468 10/100Mbps ports, 252 10/100/1,000Mbps ports, or any combination your network requires.

For added flexibility, the 3750 also supports built-in SFP (small form-factor pluggable)-based Gigabit Ethernet uplinks capable of SX (shortwave), LX/LH (long wave/long haul) and ZX (extended range) connectivity, although as with all Cisco devices, these SFPs are Cisco-only. This means not only more flexible stack configurations but an easier time migrating those same switches out of a stack and into an existing edge-based job on a larger network.

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How I tested

I used two of Spirent Communications' SmartBits 6000 chassis to load up half of our 3750 stack with roughly 50 percent 100Mbps ports and 50 percent Gigabit ports. I then blasted 100 percent port utilization 64-byte, 512-byte, and 1,518-byte frames. The 3750 Stack didn't drop a frame, and I even ran a protected video stream (from a DVD-equipped server to a client on the other side of the network) through the stack simultaneously without degradation. Finally, I used my SmartBits to test latency at multiple packet sizes during full port utilization. The 3750 handled this with aplomb, allowing only 24 microseconds at 64 bytes, 37 microseconds at 512 bytes and 52 microseconds at 1,518 bytes.

I also tested the 3750's high claims of redundancy. First, after configuring my three 3750s into a stack, I disconnected one switch while running a basic traffic blast via our SmartBits and a DVD movie from my test server to my test client. I noticed a momentary blip in the play of the movie at the time of disconnection, but



Another nice touch: If a new switch is added to a StackWise stack, it can be automatically forced to alter its configuration in subservience to the reigning configuration in the stack — even if the reigning configuration is based on an older version of IOS (Internetwork Operating System) than the new switch currently has installed.

Implementing a 3750 stack means choosing the appropriate software image. Here, you've got two choices. First, there's the SMI (Standard Multilayer Software Image). This image provides all the features that SMB (small to midsize business) network admins are used to, including access-control lists, standard QoS, rate limiting, and the usual RIP (Routing Information Protocol)-based routing features.

Our test switches, however, came with your second software image choice, the EMI (Enhanced Multilayer Software Image). This is the feature set that most large-enterprise network administrators will need with more advanced features such as hardware-based unicast and multicast routing and advanced routing protocols.

We managed the base configurations using console-based IOS. Although we've seen easier setup procedures on competing switches, we experienced no hiccups.

When setup is complete, you can switch to Cisco's CMS (Cluster Management Suite), which could stand for Cool and aMazingly Simple. CMS has embedded support in a number of Cisco product lines, and the 3750 is no exception. CMS is surprisingly robust, pleasantly intuitive, and polished.

More importantly, CMS can act as a cluster on top of the stack. Although you can physically stack as many as nine 3750s and manage them essentially as a hardware cluster, CMS allows you to cluster as many as 16 devices in software no matter where they might be physically located on the network. This clustering flexibility includes pushing out software updates to the entire cluster, and CMS also has very nice link status, diagnostic reporting, and topology information.

Cisco's Catalyst 3750 is an impressively flexible product line containing a robust feature set and enough careful engineering to appeal to SMBs as well as large enterprises. StackWise means gigabit to the desktop is now a realistic proposal, although it will probably still take some time to come to fruition.

Oliver Rist is a senior contributing editor of InfoWorld.

the system picked up in less than a second, and no more degradation was visible.

I performed the same procedure in the next test, though I made sure to disconnect the stack's master switch this time. Not only did switching continue uninterrupted, I was still able to manage the stack via IOS and CMS as a single-address cluster.

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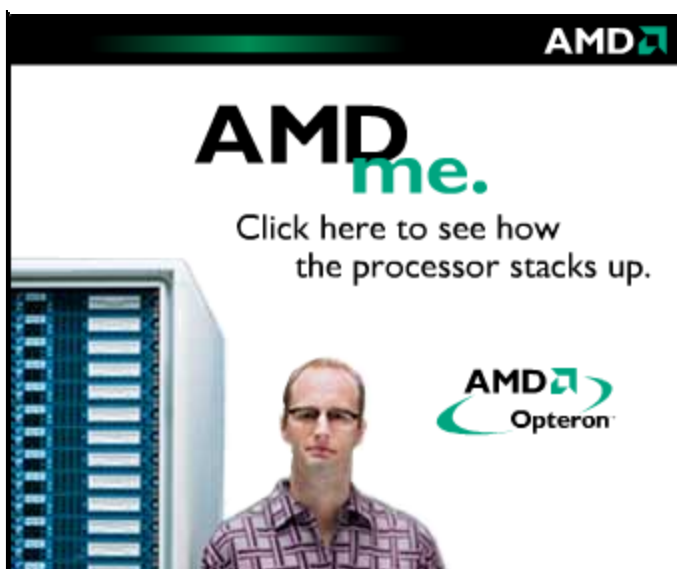
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