

Modular to the Core

Modular features and flexibility make the Catalyst 6500 Series Switch an affordable option for midsized networks.

By Gene Knauer

LAN switching features that were once available only to the world's largest enterprise networks are now available and affordable to midsized networks with 250 to 1,500 end users—thanks to product innovations in Cisco's Catalyst 6500 Series. Smaller form factors, modular components, and lower prices have garnered great interest in the Catalyst 6500 Series product line among midsized organizations. A wide range of port densities and performance and feature options make the platform equally attractive for multiple deployment scenarios.

Modularity, Options, and Affordability

While smaller than enterprise networks, today's midsized networks often have many of the same requirements as networks with thousands of end users. Midsized organizations want converged data, voice, and video services. They consider high availability and resiliency essential. Ease of use is also a big plus, as networks become more complex and traffic volumes grow. And advanced services such as firewalls, intrusion detection, wireless LAN, and virtual private networking (VPN) are also highly desirable.

“Previously, midsized businesses would deploy the Catalyst 6500 in high-density and high-performance locations,” says Marie Hattar, director of Enterprise Switching in Cisco's Product and Technology Marketing Organization. “But now they can get customized models of the Catalyst 6500 that deliver the performance, features, and form factor they want, with the ability to add additional, integrated service modules later because of the platform's modular design.”

Cisco has enhanced the affordability of Catalyst 6500 models, now with an installed base of hundreds of thousands of chassis and millions of ports worldwide, through the introduction of a Supervisor 32 Engine, giving midsized customers an alternative to the Supervisor 720. The 32 Gbit/s of throughput in the switching fabric in the Supervisor 32 is ample for most midsized networks, compared with the 720 Gbit/s Supervisor Engine, which is standard for large enterprises. The Catalyst 6500 Series chassis also comes with the choice of three, four, six, nine, or 13 slots.

“Midsized networks include many different kinds of businesses with different needs. They are definitely not ‘one size fits all,’” says Gautam Roy, Cisco product manager for the Catalyst 6500. “Giving the customer a lot of choices in how to customize LAN switches, and giving them a full range of features to choose from, has proven very successful.”



Columbia Association

CATALYST OF CHOICE Midsized organizations like the nonprofit Columbia Association are beginning to use the Cisco Catalyst 6500 Series for their converged networks.

Local Government Chooses Midsized Catalyst 6509

The network staff serving the Columbia Association, a planned community in Columbia, Maryland, chose the Cisco Catalyst 6509 switch for the core of the association's first LAN WAN to connect 42 facilities across Columbia. With 450 regular users and 1,500 seasonal employees accessing the network, the Columbia Association began planning for the move to a converged IP environment with data, voice, and video services in 2001. At that time there was no LAN or WAN, and none of the association's

42 facilities had e-mail. Only an aging minicomputer connected to point-of-sale locations at recreational facilities such as skating rinks, pools, golf courses, parks, and association offices using 56K leased lines. The phone system was equally antiquated: the private branch exchange (PBX) required 10-digit dialing between each member facility.

Program and Project Manager Nagaraj Reddi realized that an IP network could meet the Columbia Association's requirements for converged services, security, and resiliency. "We decided on the Catalyst 6509 for the core because it was much more economical to get one big switch to connect all of the facilities together rather than buying many smaller switches," says Reddi. "It occupies less space and gives us room to grow; if we need more ports or services we just add another service module blade."

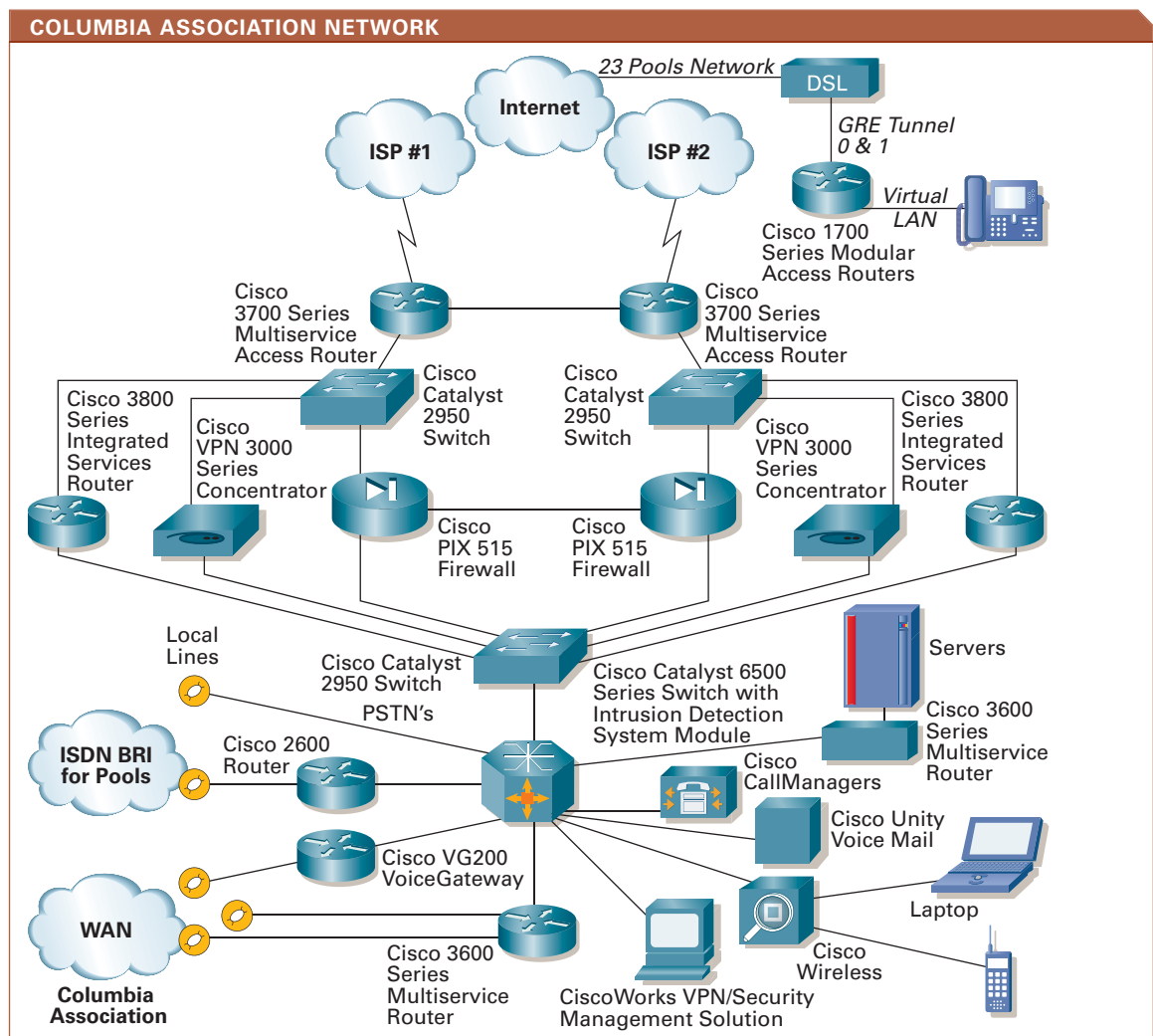
Cisco Catalyst 2950 Series edge switches in the main office and remote sites provide Gigabit Ethernet connectivity. Redundant Cisco 3800 Series Integrated Services Routers direct data, voice, and videoconferencing traffic over T1 lines, fractional T1 lines, DSL, and ISDN links to edge routers in Columbia Association facilities.

The Columbia Association has swiftly taken advantage of IP features in its Cisco end-to-end network. According to Reddi, it has installed nearly every model of Cisco IP phone, along with Cisco Aironet access points for wireless LAN connectivity in hotspots at many of the association's facilities. Segmented virtual LANs provide separate access for Columbia Association employees and visitors.

"The entire network was plug and play; we haven't had a single issue, and we continue to add new features without a problem," says Reddi, who manages the network with a staff of seven. "The phones became very popular once we showed people how to use all of the different features, and now every staff person who has a laptop can access the network through secure VPNs from their homes. The police pull up near WLAN hot spots throughout the city to access the network from laptops in their cars."

Reddi also likes the durability of the Cisco IP phones, which have endured extreme heat and cold in outdoor locations and chlorine beside indoor pools. For greater redundancy, Reddi will soon add another Catalyst 6509, although the network has thus far maintained its goal of 98 percent uptime.

INTEGRATED INFRA-STRUCTURE The Columbia Association network includes a Cisco Catalyst 6509 with an integrated Intrusion Detection System module in the network core.



Talk About It

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High Availability and Resiliency

Availability and resiliency are crucial to networks with converged voice and data services. The Catalyst 6500 has redundant power supplies that use independent circuits to lower the risk of outages due to circuit failure. This helps ensure that power-over-Ethernet (PoE) devices like IP phones always remain on. Each Catalyst 6500 Series Switch can support redundant supervisor engines with Layer 3 subsecond failover to help ensure application continuity. Integrated online diagnostics monitor the system's vital signs.

"Many midsized customers think that if a switch goes down they can rely on a spare to provide redundancy, but with the Catalyst 6500 you have built-in high availability and resiliency to eliminate downtime and lost productivity," says Cisco's Hattar. "We have also introduced Cisco IOS Software Modularity, which makes the network even more resilient and available. You can restart processes, apply patches, and perform subsystem in-service upgrades without shutting the switch down."

Easier Than Ever to Deploy, Manage, and Maintain

A variety of tools for diagnostics and troubleshooting ease the burden of deploying, managing, and maintaining the smooth operation of applications on the Catalyst 6500. Smart ports, AutoQoS, and AutoSecure tools automate the consistent configuration of multiple ports for deployment of advanced services. Web-based tools like Cisco Network Assistant and Cisco View Device Manager, help in configuration, management, and troubleshooting of the Cisco Catalyst 6500 Series.

Integrated Internal and External Security

Midsized business networks need the same level of security as enterprise and service provider networks. Self-defending network features in the Catalyst 6500 protect the network from attacks in a variety of ways. Identity-based networking services allow network managers to identify users based on the IEEE 802.11 wireless LAN specifications and either allow access, disable access, or place guest users in a separate and secure VLAN. As users move from port to port, access control lists (ACLs), quality of service (QoS) settings, and other settings move with them. Network Admission Control (NAC) on the Catalyst 6500 Series

enforces access privileges of a device based on its level of antivirus software and software patch level, and ensure policy compliance.

Malicious attacks, such as Dynamic Host Configuration Protocol (DHCP) snooping, the flooding of the Address Resolution Protocol (ARP) table, and the use of spoofed IP addresses, are all mitigated on the Catalyst 6500 Series with the Cisco Integrated Security Toolkit. Should the switch itself become a target, hardware-based control plane rate limiters and policers intercept malicious traffic directed at the CPU to counter denial-of-service attacks. Integrated Cisco NetFlow support provides enhanced packet-capturing to detect anomalous traffic behavior. Cisco NetFlow is also useful in traffic monitoring and network capacity planning, and for applications such as granular accounting for user-based billing.

Longevity and Lower Total Cost of Ownership

As midsized networks retool to add new features such as converged services, advanced security, VoIP, and WLANs, they want to benefit from an integrated infrastructure that reduces their total cost of ownership. They also want the gear they buy today to last beyond the typical three-year product refresh cycle. Product manager Gautam Roy believes that the Catalyst 6500 Series will create investment protection for customer deployment needs for the next five years or more.

Prime candidates for the platform, according to Roy, are midsized data centers of organizations with up to 1,500 employees that may support thousands of online users. A special content switching module for the Catalyst 6500 provides Layer 4–7 services for faster Web response times. ■

FURTHER READING

- "Cisco Switching Solutions for the Midsized Business" video
cisco.com/packet/181_9a1
- Cisco Catalyst 6500 Series Switches
cisco.com/packet/181_9a2
- Cisco Solutions for Small and Midsized Businesses
cisco.com/packet/181_9a3