Lippis Report
Research Note

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Cisco Compact Switches Extend Borderless Network Services to Furthest Network Points

By Nicholas John Lippis III
President, Lippis Consulting

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Cisco extended its line of Catalyst Compact Switches with twelve new “fanless” models. The new Catalyst Compact Switches support PoE +, GbE connectivity, hardware acceleration, security, energy management and most importantly, zero touch configuration and remote management features. These Compact Switches are designed to address unique requirements in the education, retail, hospitality, health care and manufacturing sectors, as well as conference rooms and small outpost offices of large corporations. What’s common across these industry sectors is the lack of IT staff usually present in classrooms, retail outlets, doctor’s offices, hotels, etc., to support local networking requirements, however many wish to deploy the same security, power and connectivity network services enjoyed at their larger facilities. With this in mind, Cisco’s Catalyst Compact Switches deliver new design options that fundamentally reduce wiring and operational cost through remote network management while increasing network performance. The same security services found in its Catalyst Access Switches, such 2960-S, 3750-X, 3560-X and 4500E, are also available in the Compact Switches. The Catalyst Compact Switches price points vary from the low range 2960-C to higher end 3560-C with GE and POE+ support. In short, Cisco’s Catalyst Compact Switches extend Cisco’s borderless network services and smart operations to the furthest points of any network. In this Lippis Report, we review Cisco’s new line of Catalyst Compact Switches.

Cisco Catalyst Compact Switches

The two lines of Cisco Catalyst Compact Switches are the 2960-C and the 3560-C. The main value proposition of these switches is that they share a large set of common features among the Catalyst family of switches, including Smart Operations, Borderless Network Security via TrustSec that provides access control plus encryption, MediaNet video services, EnergyWise power management and Cisco Prime Network Management. Unique to the Catalyst Compact Switches is that they are feature rich, yet simple to deploy, and can be cost justified based upon cable cost reduction, operational efficiency, improved security plus increased network performance.

The Catalyst Compact Switches are based on the same hardware, Cisco Network Operating System or IOS, and feature the same management capabilities of the larger 2960-S and 3750-X/3560-X Catalyst access switches. That is the Cisco Catalyst Compact Switches are engineered to be feature parity with the larger Catalyst access switches. Because Catalyst Compact Switches are low core density and small form factor devices, they are deployed in a multitude of verticals including manufacturing, retail, college dorms, hotel rooms, classrooms, conference rooms, hospitals, etc. For example, some retailers utilized the Catalyst Compact Switches to connect point of sale terminals for PoE and networking needs.

In the education sector, they are deployed in large universities, K-12, in classrooms, dormitories, etc. Hospitality and retail are large verticals for the Catalyst Compact Switches, providing secure connectivity for slot machines and large cruise lines, such as the Norwegian Cruise Line.

Because the Catalyst Compact Switches are deployed in so many scenarios, Cisco had to offer a range of mounting options, making these switches perhaps the most flexible in terms of where they can be placed. For example, Catalyst Compact Switches are easily mountable; there is even a magnetic mounting option that mounts the switch on a magnet, if the switch cannot be fastened to a stationary surface. Other mounting options include rack mount and DIN mount.

These switches are designed to be deployed outside the wiring closet and into office workspaces, retail outlets, doctor’s offices, sports facilities, etc. The Compact Switches eliminate the messy and expensive requirement to run multiple Ethernet cables from wiring closets to end points needing connectivity. Instead, a single Ethernet cable connects a Compact Switch to a wiring center switch, reducing cabling cost and complexity.

Cable Cost Elimination

The Cisco Catalyst Compact Switches avoid the cost of pulling a myriad of Ethernet cables from a wiring closet to end points clustered in the same location; this is expensive and does not provide a dynamic solution for the future of the space. Consider a large warehouse where the cost of a single cable run is between $200 to $1,000, depending upon city/state/country. Therefore, connecting a cluster of end points that are located within small vicinity that is far from a wiring closet requires multiple cables to be pulled, driving up cost. Many connect these cables directly to end points. In some cases, hubs are deployed to alleviate the cost of running multiple RJ45 cables; however this method provides an unintelligent and insecure solution to the problem, not to mention Ethernet hubs divide bandwidth between users.

Rather than spend capital on wiring, IT leaders can put that capital into a Catalyst Compact Switch and not only avoid cabling cost, but deliver higher bandwidth and a more secure user experience. For Cisco customers, there's an added benefit to the Catalyst Compact Switches' approach as they utilized the same IOS interface and Cisco Prime management software. In addition, wiring is neat and clean with one cable between a Cisco Catalyst Compact Switch and wiring closet access switch.

Conference Room Example

Consider a conference room that requires a WLAN access point, laptop connections, IP phones and a videoconferencing system that need connectivity. One can run multiple cables for each device or a single cable run and a Cisco Catalyst Compact Switch. The Cisco Catalyst Compact Switch could be mounted under the conference room table where all devices would connect. Therefore, instead of ports with cables drawn all the way to the wiring closet, the conference room could be equipped with a switch delivering secure connectivity and a management point.

Cisco's Catalyst Line of Compact Switches packs a punch in a very small form factor. We find that three standout features of these switches are Power over Ethernet (PoE), Smart Operations and built in enterprise grade security.

Power over Ethernet (PoE)

In addition to cable reduction, the Cisco Catalyst Compact Switch also delivers power efficiency, thanks to PoE and PoE+, plus they can be powered via Cisco Universal Power over Ethernet (UPOE) upstream switches. Further, Catalyst Compact Switches that support PoE can be energy managed by Cisco EnergyWise, which provides a network- based energy management system that monitors energy usage and can manage consumption much like a digital thermostat for temperature

Cisco deploys a unique PoE option for the Catalyst Compact switching products in that some models can be powered by PoE enabled Catalyst in-closet switches such as the 2K, 3K and 4K lines. In other words, a PoE enabled Catalyst (in-closet) switch, such as a 3750-X, can power downstream Catalyst Compact Switches. This means that there is no need to run power to PoE-enabled Compact Switches; only an RJ45 cable is needed. This option is much like PoE-enabled WLAN access points and IP phones being powered by in-closet PoE switches. There are Catalyst Compact Switches that also accept AC power and provide PoE service to attached devices. These devices enjoy higher PoE power budgets.

PoE Pass-Through

In addition to being powered via PoE, Compact Switches also support a unique PoE pass-through feature, which allows PoE enabled end devices such as surveillance cameras, IP phones, virtualized desktops, WLAN access points, etc., to be powered by an upstream in-closet UPoE enabled switch such as the 4500-E- series of Catalyst switches. The Catalyst Compact 2960-C and 3560-C series support Cisco UPOE, which can power up to 12 IP devices via just one Ethernet cable drop. The 3560-C PD/PSE and 3560-C FE can be powered via PoE and Cisco UPOE plus they can deliver PoE power to other end devices. As each switch requires some 30 Watts to power its

operation, and UPoE provides 60W, the remainder can be distributed to other downstream switches or switch ports. There are five Compact Switches in the 3560-C line, four of which support PoE or PoE+. There are seven switches in the 2960-C Compact Switch series, three of which support PoE.

The PoE pass-through functionality can power downstream Compact Switches, allowing a chain of Compact Switches to be powered by an upstream in-closet Cisco UPOE/PoE+ switch. For example, a hotel room may have two IP phones to connect and power that could be accommodated via a Catalyst Compact Switch. If the wiring closet switch's power is backed up, then so too is the room IP phone and Compact Switches, therefore, eliminating the need for hotel room power backup.

This option is very favorable in those office or retail environments without access to power outlets. PoE pass-through is an example of how Cisco Borderless Network services are extended down through the Catalyst Compact Switches to locations without power drops and in the process, reduce energy usage throughout the network. This functionality enables network designers to configure a workspace open to future configuration changes without being tied to traditional power outlet source locations. In addition PoE pass-through can be used to provide power redundancy for systems with previously installed power drops.

Smart Operations

The Catalyst Compact Switches support Cisco's Smart Operations, which delivers zero touch setup and on-going management features. Smart Operations includes three important features, including: 1) Smart Install, 2) Smart Configuration and 3) Smart Troubleshooting.

Smart Install eases the installation of the Compact Switch by automatically downloading a switch configuration without operator intervention. Once a Smart Install director is configured, upon Compact Switch boot, its configuration automatically downloads, bringing the switch into the network. This powerful feature allows switches to be installed by non-IT staff and auto provisioned. The Catalyst 3560, 3750X, 3560X, ISR or 4500E can be Smart Install directors for the Catalyst Compact Switches.

Smart Configuration includes Cisco's Auto Smart Ports and AutoQoS, which is similar to Smart Install but provides auto configuration for end devices. Consider an IP Phone that's connected into a Catalyst Compact Switch. With Auto Smart Ports configured, once the IP phone connects into the switch, Auto Smart Ports automatically configures the phone to be on the network and provides QoS, VLAN and other port settings.

Smart Troubleshooting enables Catalyst Compact Switches to be remotely managed and troubleshot, thus eliminating the need for local IT support staff. Just like the enterprise class Catalyst switches, Cisco's Compact Switches support GOLD or Cisco Generic Online Diagnostics, which provides diagnostics and fault-detection that speed up problem resolution by quickly identifying problems remotely.

Smart Operations is Cisco technology available in all Catalyst switches, including the Catalyst Compact Switch.

Security

Cisco's Catalyst Compact Switches completely extend the Cisco Borderless Network security architecture by incorporating the best of Cisco's Catalyst security features. Compact switches extend Cisco's TrustSec, which is an intelligent access control system that provides network or security operations visibility into who and what is connecting to the network via its Cisco ISE or Identify Services Engine.

TrustSec secures an IT infrastructure also for mobility through the support of TrustSec embedded in Cisco Compact Switches, routers and wireless access points. TrustSec allows users to access the network without regard to network access type and geographic location—be it in a classroom, dorm, doctor's office, remote office, home office, etc. In conjunction with Cisco's ISE, TrustSec delivers network-wide visibility into every user and device on the

network, and granular control over what network resources they can access.

Cisco's Catalyst Compact Switches also support MACsec, a powerful and standard encryption technology that encrypts packets between two MACsec capable devices, whether the connection is switch-to-switch or switch-to-end point. IPv6 First Hop Security (FHS) offers a suite of features that protect IPv6 networks from spoofing, Denial of Service (DoS) and man-in-the-middle attacks. Cisco's Catalyst Compact Switches also support IEEE 802.1x, the authentication system that requires an end point to present credentials to an authentication server to validate before the end point is allowed access to a protected network.

Closing

The Catalyst Compact Switches are silent, small form factor devices, sport various mounting options and are feature rich with all the major Borderless Network services, including Smart Operations, Security, EnergyWise, MediaNet and PoE support. Further, the Catalyst Compact Switches utilize the same hardware as larger Catalyst access switches providing high network performance. It's this packaging of features and design options that make the Catalyst Compact Switches well suited for multiple deployment scenarios. Since Compact Switches are deployed outside the wiring closet into small offices, retail outlets, conference rooms, sports facilities, hotel rooms, college dorms, etc., they significantly reduce wiring requirements and their associated costs. They provide an alternative to pulling expensive CAT 5 or 6 copper runs or deploying insecure hubs. Lastly, with the use of EnergyWise and PoE, easy power management and switch placement allow workspaces to be dynamic with the added benefit of minimal up front configuration cost.

Catalyst Compact Switches are easy to manage and adaptable to new office requirements without the need to consider power outlet placement, number and type of devices connecting in to the network, etc. In short, the Catalyst Compact Switches provide a unique solution to the furthest points of an enterprise network, thanks to network design options that lower cost, increase flexibility and deliver enterprise level security, power management, automated configuration plus management.

About Nick Lippis

Nicholas J. Lippis III is a world-renowned authority on advanced IP networks, communications and their benefits to business objectives. He is the publisher of the Lippis Report, a resource for network and IT business decision makers to which over 35,000 executive IT business leaders subscribe. Its Lippis Report podcasts have been downloaded over 160,000 times; i-Tunes reports that listeners also download the Wall Street Journal's Money Matters, Business Week's Climbing the Ladder, The Economist and The Harvard Business Review's IdeaCast. Mr. Lippis is currently working with clients to design their private and public virtualized data center cloud computing network architectures to reap maximum business value and outcome.

He has advised numerous Global 2000 firms on network architecture, design, implementation, vendor selection and budgeting, with clients including Barclays Bank, Eastman Kodak Company, Federal Deposit Insurance Corporation (FDIC), Hughes Aerospace, Liberty Mutual, Schering-Plough, Camp Dresser McKee, the state of Alaska, Microsoft, Kaiser Permanente, Sprint, Worldcom, Cigitel, Cisco Systems, Hewlett Packet, IBM, Avaya and many others. He works exclusively with CIOs and their direct reports. Mr. Lippis possesses a unique perspective of market forces and trends occurring within the computer networking industry derived from his experience with both supply and demand side clients.

Mr. Lippis received the prestigious Boston University College of Engineering Alumni award for advancing the profession. He has been named one of the top 40 most powerful and influential people in the networking industry by Network World. TechTarget an industry on-line publication has named him a network design guru while Network Computing Magazine has called him a star IT guru.

Mr. Lippis founded Strategic Networks Consulting, Inc., a well-respected and influential computer networking industry-consulting concern, which was purchased by Softbank/Ziff-Davis in 1996. He is a frequent keynote speaker at industry events and is widely quoted in the business and industry press. He serves on the Dean of Boston University's College of Engineering Board of Advisors as well as many start-up venture firm's advisory boards. He delivered the commencement speech to Boston University College of Engineering graduates in 2007. Mr. Lippis received his Bachelor of Science in Electrical Engineering and his Master of Science in Systems Engineering from Boston University. His Masters' thesis work included selected technical courses and advisors from Massachusetts Institute of Technology on optical communications and computing.