

ProCurve Networking by HP

ProCurve Switch 5400zl and 3500yl Intelligent Edge Series



The chassis-based ProCurve Switch 5400zl Series and stackable 3500yl Series are next-generation Layer 3/4 Intelligent Edge switches, offering unprecedented adaptive intelligence, versatility and operational excellence, to meet current and future networking demands.

All the members of the Switch 5400zl and 3500yl Series are built on the ProVision™ ASIC, the newest ASIC innovation developed by ProCurve Labs. The ProVision ASIC gives the 5400zl and 3500yl switches wirespeed policy enforcement, resiliency, ASIC programmability and high-level integration. These adaptive intelligences enable them to express the ProCurve Networking Adaptive EDGE Architecture™ vision of "control to the edge" with "command from the center."

With the 5400zl and 3500yl Series, ProCurve has introduced switches with unparalleled adaptability. They have versatile intelligent ports that combine the capabilities of the ProVision ASIC, the performance of 10/100/1000 and integrated Power over Ethernet (PoE), for optimal flexibility in port configuration, both now and in the future. Setting a new standard for versatility and scalability, the ProCurve 5400zl chassis series and 3500yl stackable series can provide from 24 to 288 10/100/1000 PoE ports per switch, with identical features, performance and lifetime warranty.

In addition, these new Intelligent Edge switches deliver enhanced efficiency, ease of management and investment protection that add up to a new level of operational excellence.

Intelligence

- More granular security and QoS policies
- Sophisticated control at wirespeed
- Closer alignment with applications for security, convergence and mobility
- Consistent user experience

Versatility

- Versatility in client connections
- Future-proofing
- Flexibility for operation in a variety of use models
- Scalable, consistent switch family

Operational Excellence

- Plug-and-play solutions
- Investment protection
- Greater efficiency in deployment, operation and maintenance
- Increased productivity

Responding to Real World Needs

Enterprises are demanding more from their networking infrastructures. Specifically, today's organizations need to secure their information assets; support an increasingly mobile workforce; allow for on-line collaboration and distributed computing capabilities; integrate control- or bandwidth-intensive applications such as voice-over-IP (VoIP), voice-over-wireless-LAN (VoWLAN) and video streaming; and prepare for future technologies with a highly scalable and flexible infrastructure.

ProCurve's vision and architecture for delivering on these needs is the ProCurve Networking Adaptive EDGE Architecture, which places control of the network at the edge, closest to the users - and the best location for enforcing network policies. Controlling traffic at this level requires switches with truly adaptive intelligence. It also requires levels of versatility and operational excellence that go well beyond the norms of the past.

In addition to providing advanced capability uniquely aligned for intelligent EDGE deployments, the 5400zl and 3500yl Series also provide a rich set of platform and software features that make them well suited for enterprise distribution/aggregation layer deployments. Bringing these features together under a common ASIC architecture and a unified set of easy-to-use management tools means that the 5400zl and 3500yl Series deliver unparalleled flexibility along with lower total-cost-of-ownership and ongoing management costs.

ProCurve Switch 5400zl and 3500yl Intelligent Edge Series

The ProCurve Switch 5400zl and 3500yl Series switches deliver intelligence, versatility and operational excellence. The members of this family of Intelligent Edge switches share a number of important features, including the following:

- Part of the ProCurve Networking Adaptive EDGE Architecture (AEA): The ProCurve AEA is based on control to the edge along with command from the center. The 5400zl and 3500yl switches provide the Intelligent Edge switching needed for security control and authentication, bandwidth shaping, data prioritization, advanced routing, WLAN management and deep packet inspection - in short, true control at the edge.
- ProVision ASIC: ProCurve's latest, internally designed ProVision ASIC confers high-end wirespeed capabilities and intelligence to all the 5400zl and 3500yl switches. Developed by ProCurve Labs, the ProVision ASIC integrates sophisticated switching functionality in a single highly reliable, high-performance chip.

The ability of the new switches to enforce policies at wire speed enhances the use of ProCurve Identity Driven Manager (IDM), software that provides secure, automated access control - and that enhances the capabilities of the AEA Intelligent Edge.
- Scalability and versatility with the same architecture: Based on the same ProVision ASIC architecture and common software feature set, the 5400zl and 3500yl Series family of products can provide from 24 to 288 gigabit PoE ports per switch, allowing them to be deployed in a wide variety of network environments.
- Comprehensive software features: Optional Premium Licenses provide the 5400zl with advanced networking Layer 2/3 protocols and features (e.g. OSFP, PIM, VRRP) uniquely suited for large-scale distribution solutions.
- Versatile intelligent ports: These ports increase the simplicity and versatility of deploying the switches. Every 10/100/1000 copper port has PoE integrated and ties into the overall capabilities of the ProVision ASIC, providing advanced wire speed packet processing.
- 10G expandability: The new switches' 10-GbE expandability supports bandwidth-intensive applications such as video streaming and distribution layer link aggregation, providing deployment flexibility and investment protection for future needs.

Intelligence

The intelligence of the ProCurve 5400zl and 3500yl switches, which is crucial for the expression of the AEA vision of shifting control from the core to the edge of the network, is due in large part to the new ProVision ASIC from ProCurve and its wirespeed intelligence.

A Spectrum of Switch Offerings

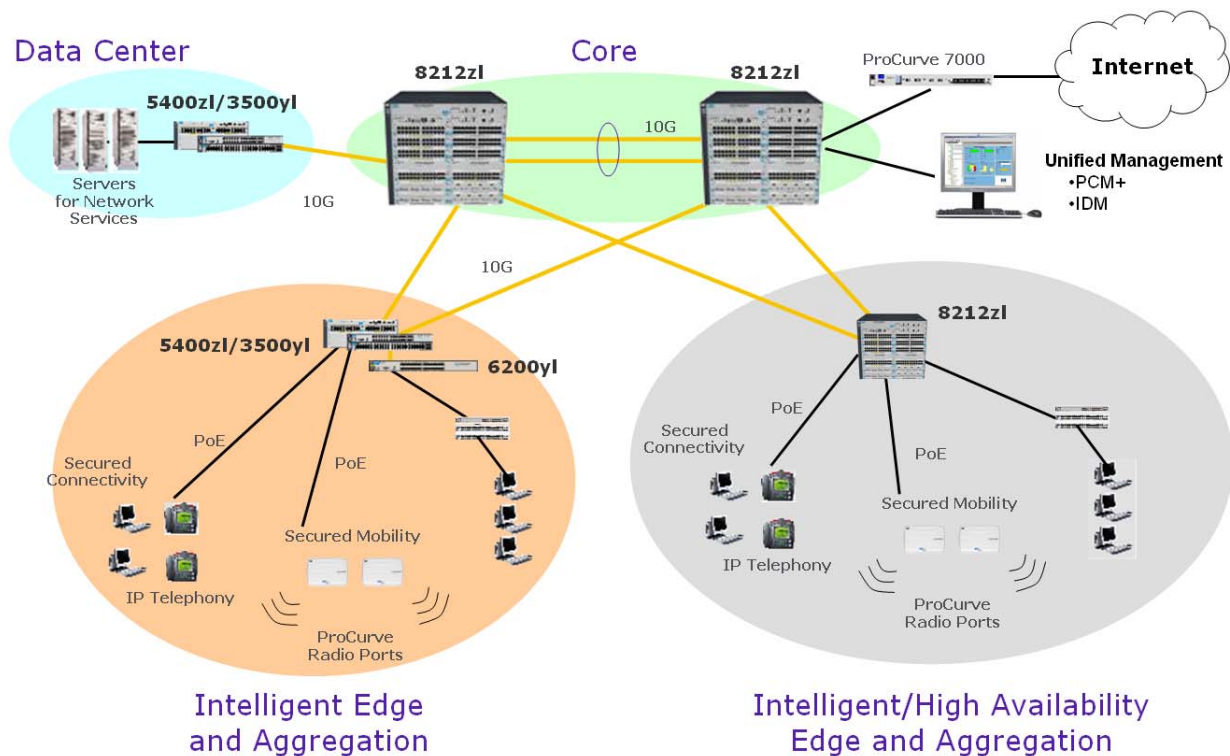
Thanks to their versatility, the 5400zl and 3500yl Series switches can be deployed in a wide range of network designs. Unique platform form factor attributes - chassis-based and stackable - make each Series switch ideally suited for specific deployments & requirements. When selecting the right platform, customers should consider dimension, density, interface flexibility, expandability, and level of hardware redundancy appropriate for their deployment. Important features are highlighted in the table below:

	5406zl	5412zl	3500yl-24G-PWR	3500yl-48G-PWR
Form Factor	Chassis	Chassis	Stackable	Stackable
Height (Rack Unit)	4U	7U	1U	1U
10/100/1000 Ports with PoE	Up to 144	Up to 288	24*	48*
Mini-GBIC	Up to 144	Up to 288	Up to 4*	Up to 4*
10GbE Ports	Up to 24	Up to 48	4 (with optional module)	4 (with optional module)
Open Module Slots	6	12	1 (for 10-GbE module)	1 (for 10-GbE module)
Power for PoE	Internal: Up to 1800W With Power Shelf: Up to 3600W	Internal: Up to 3600W With Power Shelf: Up to 5400W	Internal: 398W With ProCurve 620: 796W	Internal: 398W With ProCurve 620: 796W
Performance (Mbps)	214	428	74	110
Power Redundancy	System: Use 2 internal supplies PoE: N+1 and Full possible**	System: Use 3 (N+1) or 4 (Full) internal supplies PoE: N+1 and Full possible**	System: Use ProCurve 620 PoE: 398W N+1 with ProCurve 620	System: Use ProCurve 620 PoE: 398W N+1 with ProCurve 620
Hot Swappable	All modules	All modules	Not available	Not available
Removable Management Module	Yes	Yes	Not available	Not available
Removable Fan Tray	Yes (Hot swap)	Yes (Hot swap)	Yes	Yes

* includes dual-personality ports

**See 5400/3500 Ordering Guide for more details

The following diagram summarizes the wide range of use models for 5400zl and 3500yl Series switches:



ProVision ASIC Confers Security, Convergence, Mobility Benefits

The ProVision ASIC is a continuation of ProCurve's ASIC innovation over the past 10 years, starting with the HP AdvanceStack Switch 2000 and continuing through the 5300zl series and now the 5400zl and 3500yl series.

Its raw performance will beat that of most competitors, and the ProVision ASIC can also deliver unparalleled intelligence without sacrificing that high performance. Its built-in wirespeed intelligence provides a rich AEA experience as well as sophisticated control features right at the edge of the network.

More specifically, the ProVision ASIC offers the following benefits:

Wirespeed Policy Enforcement Engine - The ProVision ASIC enables users to deploy more secured and granular policy at wirespeed across all ports for better protection of information assets and better support for applications that require bandwidth and QoS control. The ProVision ASIC's policy engine is superior due to ProCurve's implementation of a multi-stage classifier and Ternary Content Addressable Memory (TCAM). The multi-stage classifier allows the traffic to be processed efficiently, and the ProVision ASIC's TCAM can match more policy rules simultaneously at wirespeed than competitive offerings in this class. This capability results in more granular and better-performing policy enforcement.

Built-in Resiliency - The ProVision ASIC is architected to operate continuously and withstand error conditions and malicious network attacks. The 5400zl and 3500yl switches use a combination of software and ProVision ASIC functionality to verify all the data packets sent to the CPU. Excessive packets from malicious attacks or

network misconfiguration can be identified and demoted to lower-priority queues before they overwhelm and shut down the CPU and the switch.

In addition, the ProVision ASIC has designed-in processes such as end-to-end data checking, embedded RAM error correction and ECC on an external DRAM. These processes ensure the integrity of the traffic as it passes through the switch, protecting the traffic from environmental elements.

Investment Protection - The ProVision ASIC confers investment protection through a programmable network processor feature that allows some future requirements to be accommodated. The network processor is based on patented technology from Hewlett-Packard. New algorithms can be programmed into the ASIC to support new traffic classifications by inspecting deep into the data packets. This enables the ProCurve switches based on the ProVision ASIC to support applications and policy rules that do not yet exist.

Higher Reliability and Lower TCO - The ProVision ASIC integrates components that normally are found on separate chips, such as the embedded processor, memory (e.g., TCAM, input), packet classifier, MAC and network processor. Because it is so highly integrated, the ProVision ASIC leads to a reduced number of components needed throughout the switch, which translates into increased reliability and lower total cost of ownership. It also means higher port density due to the smaller overall form factor.



The 5400zl and 3500zl Series of switches excel at supporting applications in three main areas:

Security

In today's environment, security is a top concern for all network managers. The ProCurve 5400zl and 3500zl switches help with security in a number of ways, including the following:

- Granular policy enforcement: Wirespeed packet processing and selection for Remote Intelligent Mirroring, ACLs, QoS, rate limiting and other features
- Mitigation of malicious attacks through Virus Throttle, ICMP throttling, CPU DoS protection and Detection of Malicious Attacks
- Secure network access with 802.1X, Web/MAC auth, identity-driven and per-port ACLs; protect network with DHCP Protection, BPDU Port Protection, Dynamic ARP Protection, Dynamic IP Lockdown and STP Root Guard
- Secure network management via TACACS+, SSHv2, secure FTP and secure encryption of all access methods - CLI, GUI or MIB - through SSHv2, SSL and/or SNMPv3
- Dynamic per-user policy: With Identity Driven Manager (IDM) and 5400zl/3500zl switches, ProCurve provides the unique ability to set and enforce individual user's policies (e.g., ACL, QoS, and rate-limiting) automatically in the switch as users connect to the network

* requires Premium License

Convergence

Mainstream convergence applications such as IP telephony and video-over-IP are providing new and better ways for businesses to serve their customers, reduce cost and increase productivity. But traffic from these applications places different requirements on the switch infrastructure. The ProCurve 5400zl and 3500zl switches offer the following features to ensure that converged traffic is delivered according to its more stringent requirements:

- Multicast support via data-driven IGMP, PIM Dense* and PIM Sparse*
- QoS, including eight hardware priority queues and selectable queue configuration; prioritization based on Layer 2 (802.1p, MAC address), Layer 3 (DSCP, IP address) and Layer 4 (TCP/UDP port) markings; ability to set or rewrite 802.1p priority tag based on IP address, IP ToS, TCP/UDP port and DSCP
- Bandwidth shaping by enforcing ingress/egress maximum and egress guaranteed minimum bandwidths
- Support for IP telephony, through interoperability with industry-leading IP telephony vendors; LLDPMED, which enables automatic configuration of QoS and VLAN; RADIUS VLAN which uses standard RADIUS attribute to automatically configure VLAN for IP phones
- iSCSI support, which enables the deployment of Ethernet storage area network solutions using the iSCSI standard

Mobility

The ProCurve 5400zl and 3500zl switches allow network managers to respond to users' increasing mobility with support for wireless LAN access points as well as providing 802.3af and pre-standard PoE support. With the addition of the Wireless Edge Services zl Module, the ProCurve Switch 5400zl series provides centralized wireless LAN configuration and management of advanced wireless services. This centralized approach to wired and wireless management streamlines device configuration, enables network monitoring and response to wired and wireless network threats and administration of security and role-based user policies that are enforced at the edge of the network, regardless of how or where the user connects.

- Layer 3 radio port adoption supports network-wide and auto configuration of ProCurve radio ports enabling rapid deployment of a wireless LAN with minimal network reconfiguration
- Wireless mobility domain provides seamless client network connectivity as mobile users roam across subnet boundaries
- Robust guest account administration provides secure, yet easy to implement, browser-based network access for guest users
- Wireless LAN self-healing and RF interference avoidance provides network resiliency, assures wireless network availability



Flexibility and Scalability

An important factor in the flexibility and scalability of the 5400zl and 3500yl switches is that all the copper ports provide the same 10/100/1000 performance, ProVision ASIC intelligence and integrated PoE.

These versatile intelligent ports provide flexibility for operation by enabling anyone to be connected to any 5400zl or 3500yl switch regardless of user type, application or type of end device. Solution high-availability is critical for customers to be able to support uptime imperatives for their business while allowing them to reliably and seamlessly scale their network over time. The ProCurve 5400z; and 3500yl Series provide a wide range of platform high-availability features to meet these needs:

- IPv6, which increases the ubiquity of the Internet; currently supports IPv6 host, IPv4/IPv6 dual stack, and MLD Snooping VRRP*, which allows groups of two routers to dynamically back each other, is available for redundant router environments
- ProCurve Switch Meshing, which dynamically loadbalances across multiple active redundant links in a Layer 2 environment to increase available aggregate Bandwidth 802.1ad Q-in-Q*, which increases Ethernet's scalability and allows multiple LAN's in different locations to be connected in a campus or metro network
- OSPF ECMP* (Equal Cost Multipath), which dynamically load-balances across multiple active equal-cost paths between routers in a Layer 3 environment
- 802.1s MSTP, which provides high link availability in multiple-VLAN environment so 802.3ad LACP, which supports up to 36 trunks, each with up to 8 links (ports) per trunk; trunking across modules is also supported
- Hot-swappable modules, including the management module for the 5400zl, and optional redundant power supplies (for the 5400zl)
- Dual flash images and multiple config files
- Uni-Directional Link Detect (UDLD) prevents network downtime from fiber link break

* requires Premium License

Operational Excellence

The ProVision ASIC and Versatile Intelligent Port allow plug-and-play solutions across the ProCurve 5400zl and 3500yl switch family. Along with a comprehensive, unified set of configuration management tools, this capability yields efficiency in deployment, operation and maintenance, which in turn leads to reduced costs and increased productivity.

The Command Authorization and USB Autorun features in the ProCurve 5400zl and 3500yl switches also improve productivity in deploying, managing and operating networks. These features allow less-experienced or remote network managers to participate in installing and managing the switches.

Another important component of operational excellence is investment protection. The programmability of the ProVision ASIC helps future-proof the ProCurve 5400zl and 3500yl switches, enabling the architecture to provide room for future features that support changes in businesses and applications. The ProCurve Switch 5400zl Series has a removable management module (part of its chassis design) that add investment protection for those switches. And because all the 5400zl and 3500yl switches already include 10-GbE capability, 10/100/1000 to the desktop and PoE on every 10/100/1000 port, customers can avoid unnecessary upgrade cycles. Finally, ProCurve's industry-leading lifetime warranty and free software update policies help lower operation and maintenance costs, making the ProCurve 5400zl and 3500yl switches a wise long-term investment.

The Next Generation, Now

The next-generation ProCurve 5400zl and 3500yl Series switches build on the Adaptive EDGE Architecture, enhancing control at the network edge and providing increased intelligence, versatility and operational excellence.

Historically, customers have had to choose among functionality, performance or PoE at the edge. With this new 5400zl/3500yl family of Intelligent Edge switches, ProCurve is offering a no-compromise alternative: functionality, performance AND PoE at the price previously required for any one of these capabilities. Investments made today in these next-generation switches will last well into the future.

Switches

J8692A: ProCurve Switch 3500yl-24G-PWR	1U stackable switch with 24 10/100/1000Base-T, (including 4 dual-personality ports), PoE on all 10/100/1000, and optional 10GbE
J8693A: ProCurve Switch 3500yl-48G-PWR	1U stackable switch with 48 10/100/1000Base-T, (including 4 dual-personality ports), PoE on all 10/100/1000, and optional 10GbE
J8697A: ProCurve Switch 5406zl Intelligent Edge	4U modular chassis switch with a management module and 6 open slots. Power supplies must be ordered separately.
J8699A: ProCurve Switch 5406zl-48G Intelligent Edge	Chassis bundle with two 24-port 10/100/1000 PoE modules (48 ports total), one 875W power supply in a ProCurve 5406 chassis. Four open slots.
J8698A: ProCurve Switch 5412zl Intelligent Edge	7U modular chassis switch with a management module and 12 open slots. Power supplies must be ordered separately.
J8700A: ProCurve Switch 5412zl-96G Intelligent Edge	Chassis bundle with four 24-port 10/100/1000 PoE modules (96 ports total), two 875W power supplies in a ProCurve 5412 chassis. Eight open slots.

Modules/Premium Licenses

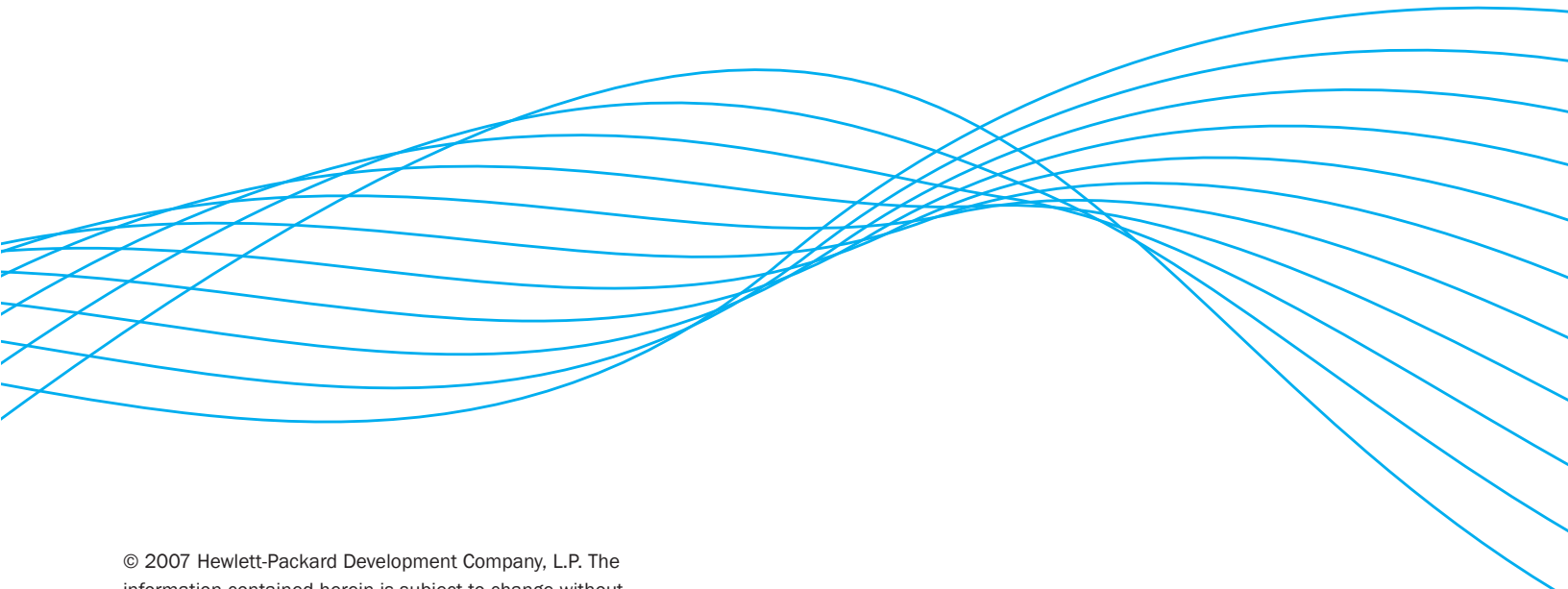
J8707A: ProCurve Switch zl 4p 10-GbE X2 Module
J8702A: ProCurve Switch zl 24p 10/100/1000 PoE Module
J8705A: ProCurve Switch zl 20p 10/100/1000 + 4p Mini-GBIC Module
J8708A: ProCurve Switch zl 4p 10-GbE CX4 Module
J8706A: ProCurve Switch zl 24p Mini-GBIC Module
J9051A: ProCurve Wireless Edge Services zl Module
J9052A: ProCurve Redundant Wireless Services zl Module
J8993A: Premium License for Switch 3500yl Series
J8994A: Premium License for Switch 5400zl Series
J8694A: ProCurve Switch yl 10-GbE 2p CX4 + 2p X2 Module
J8713A: ProCurve Switch zl 1500W Power Supply
J8712A: ProCurve Switch zl 875W Power Supply

Accessories

J4860B: ProCurve Gigabit-LH-LC Mini-GBIC
J4859B: ProCurve Gigabit-LX-LC Mini-GBIC
J4858B: ProCurve Gigabit-SX-LC Mini-GBIC
J8177B: ProCurve Gigabit 1000Base-T Mini-GBIC
J8440A: ProCurve Switch 10-GbE X2-CX4 Transceiver
J8439A: ProCurve 10-GbE CX4 Media Converter
J8438A: ProCurve 10-GbE X2-SC ER Optic
J8437A: ProCurve 10-GbE X2-SC LR Optic
J8436A: ProCurve 10-GbE X2-SC SR Optic
J8696A: ProCurve 620 Redundant/External Power Supply for 3500yl and 6200yl switches
J8714A: ProCurve Switch zl Power Supply Shelf External power supply shelf for zl switches
J9009A: ProCurve Manager Plus 2.1 unlimited license
J9012A: Identity Driven Manager 2.0 base product (500-user license)

For more information

To learn more about these important new switches, go to www.procurve.com or contact your ProCurve reseller or sales representative.



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