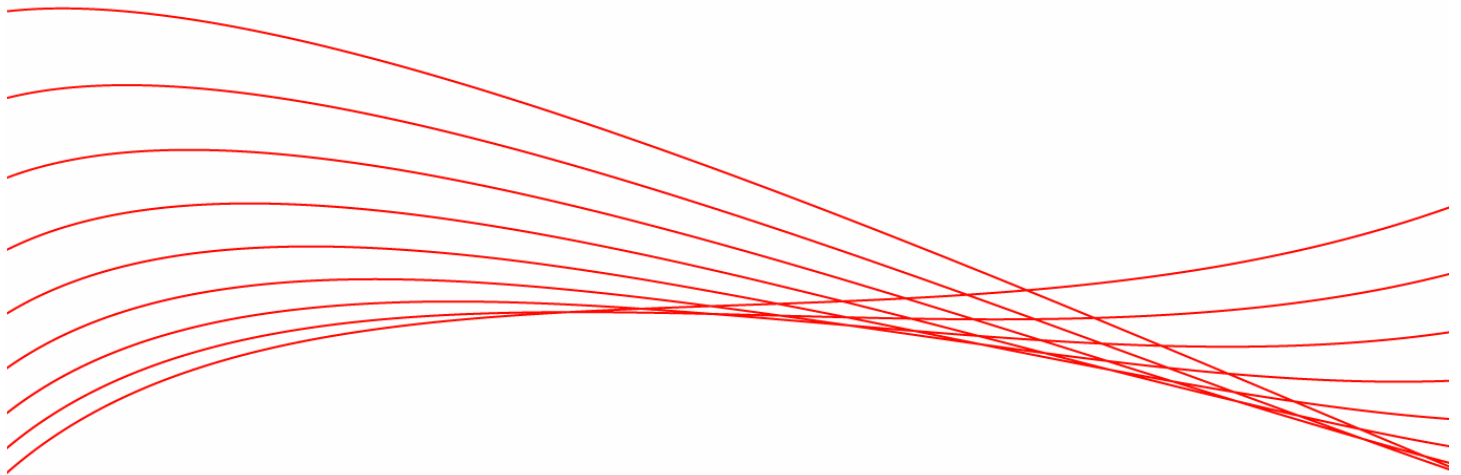


ProCurve and Avaya Convergence Solution Brief



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Introduction

As businesses evaluate their infrastructure and voice communication requirements, they increasingly demand a best-of-breed, complementary solution that will satisfy their current and future needs. ProCurve Networking and Avaya deliver a complete, fully interoperable, and secure IP telephony solution that meets the stringent performance, reliability, and voice quality requirements demanded by business class customers.

The ProCurve Adaptive EDGE architecture provides an open, standards-based framework that application providers, such as Avaya, can leverage to deliver their solutions with maximum effectiveness. By providing robust, feature-rich intelligence at the network edge, the ProCurve architecture ensures a stable, reliable, and interoperable environment for IP telephony implementation.

The ProCurve 5400zl, 3500yl, 5300xl, and 2600-PWR series of intelligent edge switches offer advanced convergence and communication application support with built-in 10/100/1000 PoE, Quality of Service (QoS) protocols, multi-user 802.1X client authentication, LLDP-MED support, DoS attack mitigation, virus throttling, and extensive Layer 3/4 features at full line rate performance, for optimum security and traffic management.¹ The majority of ProCurve products come standard with an industry-leading lifetime warranty that includes next-business-day advanced replacement, and free software updates for as long as the customer owns the product. These ProCurve intelligent edge switches have been certified for interoperability with Avaya IP phones and telephony solutions.

Avaya offers the feature-rich IP Office solution for converged voice and data technologies, Voice-over-IP (VoIP), and security systems and services. The IP Office solution scales from 2 to 360 extensions to meet the business-critical needs of networked branches, head offices, and standalone businesses.

Testing, Certification, and Reference Design

As a leader in driving and promoting industry standards, ProCurve Networking performs rigorous testing and multi-vendor certifications to ensure interoperability with the leading IP telephony products, including solutions from Avaya.

ProCurve and IP Office VoIP Interoperability Testing

ProCurve and Avaya both performed extensive testing to validate proper Layer 2 and Layer 3 performance, QoS, and interoperability in various configurations for an Avaya IP Office running over a ProCurve network infrastructure consisting of a ProCurve Switch 5406zl, ProCurve Switch 2626-PWR, ProCurve Switch 3500yl-24G-PWR, and ProCurve Switch 5304xl, all powered via IEEE 802.3af standard PoE power.

All tests were performed using both the G.711 and G.729a voice compression codecs on the Avaya IP Phones, with frame sizes varying from small (64 bytes) to large (1518 bytes). Varying traffic loads were injected into the topology, including network congestion where the ingress bandwidth exceeded the inter-switch link capacity. Packet loss, jitter, and delay were analyzed to determine the impact on voice quality.

In every test case, the ProCurve / Avaya solution scored the maximum theoretical voice quality for both the G.711 and G.729 voice codecs, even in “oversubscribed” network bandwidth conditions. No voice quality impairments or call signaling issues were observed under any of the tested situations, including those with network congestion.

¹ ProCurve 2600 series switches do not offer gigabit PoE and virus throttling. ProCurve 5300 series switches do not support GbE PoE.

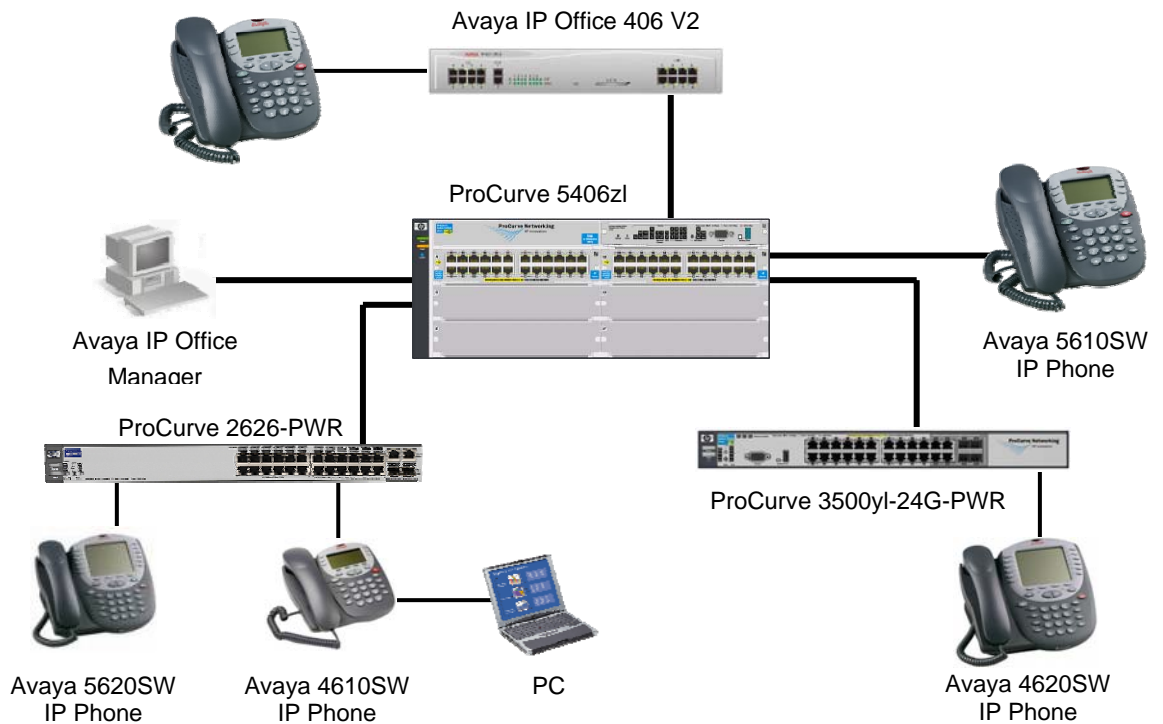


Figure 1. Reference design

The Avaya DeveloperConnection Program

Avaya performs rigorous compliance testing to certify technology solutions that are fully compatible with its IP telephony products. Avaya has certified the ProCurve Switches 5400zl, 3500yl, and 2600-PWR as fully compliant with IP Office v3.2, assuring customers of successful product interoperability.

Avaya certifies compliant solutions and makes them available to customers through the Avaya DeveloperConnection program, which also includes detailed application notes that describe how to configure and administer the solution, and provides technical contact information.

Case Studies Available

Case studies on the ProCurve website provide reference solutions on how ProCurve and Avaya together deliver world-class IP telephony solutions in education, infrastructure, and other markets.

HP Japan's Customer Response Centre

In replacing its 10-year-old PBX system, HP Japan's Customer Response Centre required a highly scalable and redundant Call Center solution that would provide 24x7 support. To deliver this solution, the Customer Response Centre decided to implement an advanced IP telephony communications network from ProCurve and Avaya. Their choice was based on the track record of the two companies, with confidence that the new network would provide the required reliability and flexibility for the Centre to upgrade its service quality.

The Customer Response Centre successfully established the new IP telephony system within the targeted 100 days, and the switchover from the PBX system was completed over a weekend. What's more, the Centre estimates that it has cut operating costs by over 40 percent as a result of increased operational efficiencies. "Previously, any system and process modification would take two days to implement, but now, it can be done in half a day," according to Takaharu Oku of the Centre's Network Service Department. "We have established the foundation of an open telephony environment. Because it is so flexible and easy-to-use, the ProCurve network infrastructure is just like any other 'utility' — readily available on-demand."

Read more: http://www.hp.com/rnd/pdfs/HP_ResponseCentre.pdf

Yuma (Arizona) Schools

The Yuma (Arizona) public schools manage an Avaya IP telephony system, with more than one thousand Avaya 4610 and 4620 VoIP phones deployed across multiple sites servicing the needs of 21,000 students and 1,000 teachers, with plans to grow to 3,000 VoIP phones. ProCurve switches have virtually eliminated Yuma's prior network reliability problems, and ProCurve's accessible phone support services help Yuma keep their network running smoothly all the time. According to technology director Dave Bradley, "Getting the Avaya VoIP phones running on the ProCurve infrastructure is painless because they just plug together."

Read more: http://www.hp.com/rnd/pdfs/Yuma_Schools.pdf

Better Together: Competitive Advantages

ProCurve and Avaya are trusted partners, representing two of the leading brands in their respective market segments. Businesses that choose ProCurve and Avaya for their technology needs are partnering with established, stable global companies that provide market leading solutions and support.

Both ProCurve and Avaya have been active leaders in driving the adoption of open industry standards. Several convergence-related standards in particular highlight the advantages of an IP telephony solution from ProCurve and Avaya.

IEEE 802.1X-2004 is the industry standard for network access control. With 802.1X, network access is only granted if the user or device is authenticated against a centralized database. Decision-making is consolidated at the RADIUS server, which ensures that only verified users can access critical network resources.

The **IEEE 802.1AB-2005 - LLDP** (Link Layer Discovery Protocol) standard, supported by Avaya and ProCurve and gaining widespread adoption across the industry, enables network devices to automatically discover one another and how they are physically interconnected, regardless of the brand or type of device. IP phones and other devices can advertise information about themselves to their networking peers and store the information that they discover in a standard SNMP MIB, which can be queried by third-party management applications. For administrators of multi-vendor networks, LLDP enhances the ability to accurately discover the network topology; diagnose potential network configuration problems; and simplify network management.

ANSI/TIA-1057 - LLDP-MED (Media Endpoint Device) extends the base LLDP standard, specifically for VoIP and other convergence applications. LLDP-MED provides for the auto-configuration of the voice VLAN and QoS configuration, detailed inventory management, fine-grain power control, and discovery of physical location. When you deploy a new IP phone, or for subsequent Moves, Adds, and Changes (MAC), there's no need to manually configure the phone or switch port – thanks to plug-and-play provisioning, operator and configuration errors are virtually eliminated. One important aspect of this convergence standard is in emergency call service (e.g. E-911, 999, 112). A supported IP phone or other multimedia device can automatically obtain its physical location information upon connecting to the network, thus enabling the correct physical location to be included as part of an emergency call to the Public Safety Answering Point (PSAP).

Summary

To enhance business communication and boost employee productivity, organizations are moving rapidly to adopt IP telephony solutions. To ensure that their deployments are successful, businesses require open standards-based solutions that can provide the necessary reliability, enterprise-class security, and QoS requirements so that even the most demanding applications, like voice, run smoothly regardless where they are in the network or how they are connecting to it. ProCurve Networking solutions, based on the Adaptive EDGE Architecture, are purpose-built from the ground up with convergence requirements in mind to deliver the most cost-effective and reliable framework for the delivery of IP telephony.

ProCurve and Avaya together deliver exceptional call quality with proven reliability for enterprise network users, at an extremely competitive cost of ownership. Based on the rigorous joint testing and interoperability certification, customers can be confident that the highly scalable ProCurve intelligent edge switches will integrate smoothly with Avaya IP telephony applications to deliver high-quality voice across the LAN.

ProCurve switches have been tested and verified to deliver predictable and consistent toll-quality voice, even when under traffic congestion conditions. As a result, customers can be confident that the highly scalable ProCurve 5400zl, 3500yl, 5300xl, and 2600-PWR intelligent edge switches will integrate easily and smoothly into Avaya IP telephony applications, delivering high-quality voice across the ProCurve network. With integrated gigabit PoE, powerful QoS features and ProCurve's industry leading lifetime, next-business-day advance replacement warranty, ProCurve switches represent a safe and flexible investment and are the clear choice for any standards-based IP telephony environment.

For more information

ProCurve Networking product overviews:

- http://www.hp.com/rnd/products/switches/ProCurve_Switch_3500yl-5400zl_Series/overview.htm (ProCurve Networking Switch 3500yl/5400zl series)
- <http://www.hp.com/rnd/products/switches/switch2600series/overview.htm> (ProCurve Networking Switch 2600 series)
- <http://www.hp.com/rnd/products/switches/switch5300xlseries/overview.htm> (ProCurve Networking Switch 5300xl series)

ProCurve Networking convergence solutions:

- <http://www.hp.com/rnd/solutions/convergence.htm>

White papers:

- <http://www.hp.com/rnd/library/whitepapers.htm> (ProCurve Networking)
- <http://www.avaya.com/master-usa/en-us/resource/assets/whitepapers/lb1842.pdf> (Avaya Communication Architecture)
- http://support.avaya.com/elmodocs2/security/802_1x-LLDP.pdf (802.1X, LLDP, LLDP-MED, and Avaya IP telephones)
- <http://www.avaya.com/master-usa/en-us/resource/assets/whitepapers/extreme%20lldp%20white%20paper.pdf> (LLDP technical brief)

Avaya IP Office

- http://www.avaya.com/gcm/master-usa/en-us/products/offers/ip_office.htm (for small and medium businesses)

The Avaya DeveloperConnection program:

- <http://www.devx.com/avaya/Door/30219>
- <http://www.avaya.com/gcm/master-usa/en-us/corporate/alliances/developerconnection/index.htm>
- http://www.avaya.com/master-usa/en-us/resource/assets/applicationnotes/avayahp_rstp.pdf
- <http://www.avaya.com/master-usa/en-us/resource/assets/applicationnotes/hp-poe.pdf>

For detailed information on the testing process and test results, please contact your ProCurve Networking sales representative.

To find out more about
ProCurve Networking
products and solutions,
visit our web site at

www.hp.com/go/procurve



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