

Cisco Voice and Video-Enabled IPSec VPN Solution

Delivering Toll-Quality Multiservice IPSec VPNs

Virtual Private Networks (VPNs) offer a lower cost and highly flexible alternative to replace or augment dedicated private networks using leased lines, Frame Relay, or ATM. VPNs provide tremendous cost savings for enterprise data networks by utilizing shared networks secured by encrypted VPN tunnels. The trend toward network convergence, however, places new demands on VPNs. With voice and video-enabled VPNs (V³PN) delivered by Cisco, enterprises can leverage cost-effective VPNs to add voice and video to their data network without compromising quality and reliability.

Cisco V³PN solutions integrate cost-effective, secure connectivity provided by site-to-site VPNs with the Cisco AVVID architecture for delivering converged voice, video, and data over IP networks. V³PNs deliver cost-effective, flexible wide-area connectivity, while providing a network infrastructure that supports the latest converged network applications like IP telephony and video.

Key benefits and applications of Cisco V³PN solutions include:

- *Cost-effective voice, video, and data connectivity in geographically dispersed locations*—Customers can use the multiservice capabilities of V³PN to connect de-centralized office environments, such as remote office/home office connectivity, complete with a PBX extension. Furthermore,

businesses can deliver video-based training and take advantage of the efficiencies of unified messaging applications in these locations to reduce business operations costs.

- *VPN infrastructure for today's applications*—V³PN provides a VPN infrastructure capable of transporting converged voice, video, and data traffic across a secure IPSec network. Unlike many VPN devices on the market, Cisco VPN platforms accommodate the diverse network topologies and traffic types characteristic of multiservice IPSec VPNs, and thereby ensure the VPN infrastructure does not break multiservice applications deployed now or in the future.
- *End-to-end network architecture*—Cisco provides products for all aspects of multiservice VPNs, from Cisco VPN routers with Cisco IOS[®] software to Cisco CallManager and IP Phones. Furthermore, Cisco provides an overarching deployment model for these products through the Cisco AVVID architecture for converged networking and the SAFE Blueprint for VPNs. These deployment models ensure a secure, interoperable, reliable network solution with end-to-end product support.



- *Securing the entire multiservice network*—Cisco network security solutions provide more than encryption of multiservice traffic across the VPN; they also ensure interoperability with Cisco PIX Firewalls for perimeter security and Cisco Intrusion Detection System for network attack protection.
- *Service provider partners*—Service providers deliver the bandwidth over which VPNs operate. Through the Cisco Powered Network program, enterprises can select service providers who deliver the low-latency network fabric critical to high quality voice and video across the VPN, or select fully managed V³PN services.

Technologies Behind V³PN

At the heart of Cisco V³PN solutions is Cisco VPN routers running Cisco IOS software. Delivering toll-quality voice and video over IPsec VPNs requires more than just encrypting traffic—it requires a blend of advanced multiservice and IPsec VPN technologies. Key Cisco IOS software technologies enabling Cisco V³PN include:

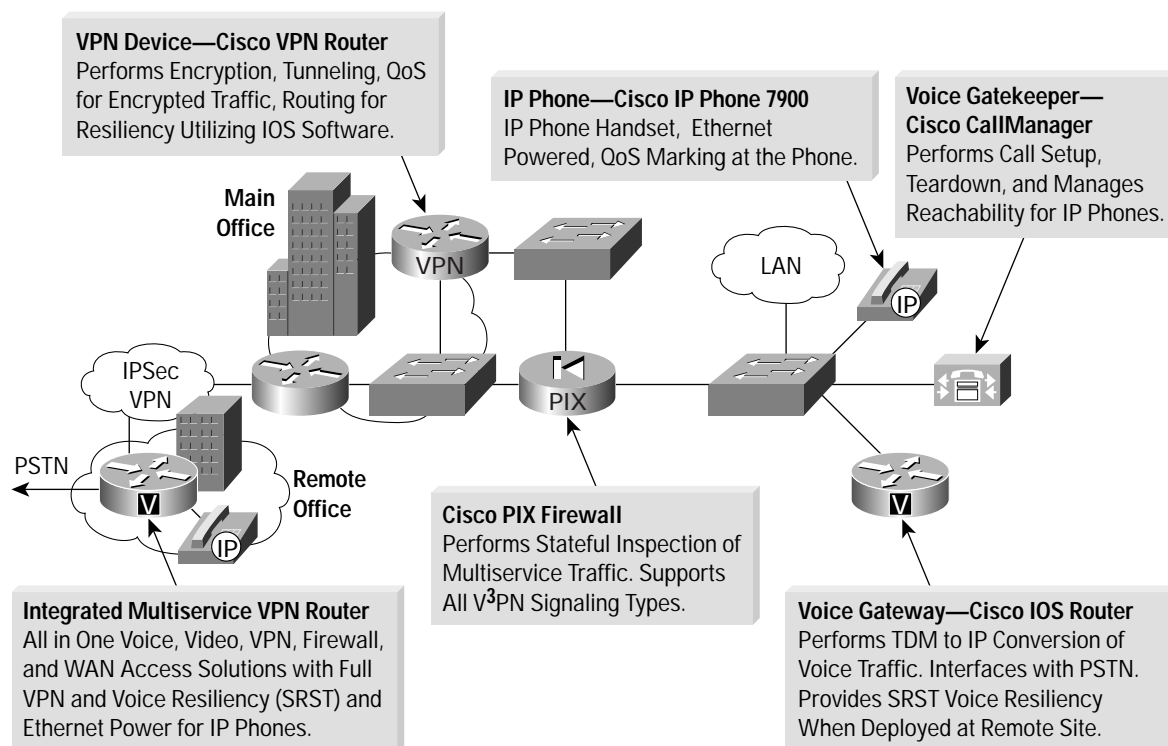
- *Multiservice-centric quality of service (QoS)*—Delivering toll-quality voice and video services requires QoS that addresses end-to-end transport quality. Low-latency queuing provides a foundation for prioritizing multiservice traffic and delivering specific bandwidth and latency guarantees. Cisco provides comprehensive low-latency queuing capabilities, including features specific to encrypted voice and video traversing the VPN. Furthermore, rich Cisco QoS features like *traffic shaping* to ensure quality on asymmetric link speeds and *link fragmentation and interleaving* (LFI) to control jitter in the presence of large packet transmissions like FTP are critical to ensuring voice and video quality on the VPN.
- *Support for diverse traffic types*—IP video traffic and voice traffic like hoot and holler and music on hold require support for multicast traffic across the VPN. Though IPsec is a unicast protocol, Cisco VPN routers, utilizing Cisco IOS software, accommodate multicast traffic and ensure the VPN infrastructure does not break multiservice applications.
- *Support for multiservice network topologies*—Because multiservice traffic is latency sensitive, network topologies must often be adapted to reduce network hops and minimize latency. Cisco VPN routers set the standard in delivering topology flexibility in network designs, accommodating topologies beyond basic hub-and-spoke designs to include hierarchical and fully meshed networks. Furthermore, Cisco VPN routers offer embedded software features such as Dynamic Multi-Point VPN that provide automated, dynamic provisioning of meshed networks for ease of deployment.
- *Enhanced network failover capabilities*—The Cisco V³PN solution provides comprehensive resiliency, addressing both VPN network transport and the IP telephony network. The full Layer 3 routing and stateful VPN failover capabilities of Cisco VPN routers provide network resiliency beyond the VPN device all the way to the network host, thereby eliminating network black holes. Survivable Remote Site Telephony (SRST) features for remote offices provide telephony-specific resiliency to ensure the voice network continues operating in the event of lost connectivity to the headquarters site.

Putting It All Together: Components of Cisco V³PN Solutions

Cisco provides a broad portfolio of products and proven deployment architectures for IP telephony and video networks, as well as IPsec VPNs. Cisco is uniquely positioned to deliver the converged network solution offered in V³PN. Deploying Cisco V³PN solutions ensures interoperability of multiservice applications over IPsec VPNs and provides a single source for network design guidance and support. See Figure 1 for an illustration of Cisco V³PN.



Figure 1
Cisco Voice and Video-Enabled IPsec VPN Solution



Products that enable an end-to-end multiservice VPN infrastructure include:

- **Cisco VPN Routers**—Perform basic IPsec VPN functions such as encryption and tunneling, while providing critical multiservice-enabling features like enhanced QoS, multicast VPN support, and stateful failover and routing for resiliency. For remote locations, Cisco VPN routers deliver all-in-one voice, video, VPN, firewall, and WAN access functionality with full VPN and voice resiliency through SRST, and Ethernet power for Cisco IP Phones. Newly announced platforms such as Cisco 830 Series Secure Broadband Routers and Cisco 3700 Series VPN Routers deliver enhanced scalability for all network sites in Cisco V³PN deployments.
- **Cisco CallManager and Cisco IOS Gateways**—Perform call setup, teardown, TDM-to-IP conversion of voice traffic, and manage reachability for IP phones. Cisco IOS gateways provide interfaces to the PSTN and SRST voice resiliency when deployed at remote sites.
- **Cisco IP Phones**—Offer Ethernet-powered IP phone handset with enhanced functionality like handset-based directories and Web services.
- **Cisco PIX Firewalls**—Perform stateful inspection of multiservice traffic and support prevalent IP telephony signaling protocols, including signaling between Cisco IP Phones and Cisco CallManager.
- **Cisco Intrusion Detection Systems**—Provide host-based intrusion detection and denial-of-service prevention on the IP telephony infrastructure.

Bottom Line: Operational Efficiency

Operational efficiency means different things to different people. For the network manager it means ease of deployment and management of networks. For company strategists it means using the network to deliver new applications that differentiate their organization from competitors and open new markets. For the fiscally minded it means increasing productivity while reducing costs...doing more with less. Cisco V³PN solutions deliver operational efficiency, regardless of the definition, by delivering next-generation converged communications over the most cost-effective, flexible network connectivity available—VPNs.

Cisco Multiservice VPN Solutions Suite

The Cisco V³PN solution is part of a suite of multiservice VPN solutions delivered by Cisco. Cisco also offers solutions for transport of voice and video across MPLS networks and managed dial plan voice VPNs. Together these solutions offer unsurpassed deployment flexibility and feature depth in delivering converged network services for enterprise and service provider networks.



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