How Cisco ASR 1000 Enables Cisco Business Strategies by Providing Capacity and Resiliency for Collaborative Applications

Cisco ASR 1000 Routers support company shift toward virtualized data centers and cloud computing.

EXECUTIVE SUMMARY

CHALLENGE [Style: CellHead1]

- [Style: CellBullet] Fort Sam Houston, San Antonio, Texas
- 3000 employees, 450 beds

SOLUTION

- Connect clinicians to phone network in an environment that is inhospitable to cell phones
- Help enhance employee efficiency
- Increase staff job satisfaction
- Move patients through the process faster

RESULTS

- Install medical-grade VoIP network
- Provide compatible pocket-size wireless telephones with preprogrammed numbers

LESSONS LEARNED

- Install medical-grade VoIP network
- Install medical-grade VoIP network

NEXT STEPS

- Turn downtime into productive time for anesthesiologists during medical procedures that could last several hours, a real “force multiplier” by military standards

Background

With 70,000 employees in hundreds of locations around the globe, Cisco Systems relies on a high-capacity, robust network infrastructure for effective communication and collaboration. This case study explains how Cisco® ASR 1000 deployments in nine different application areas provided needed network capacity, while also playing an integral role in the Cisco shift toward data center virtualization and cloud computing. Cisco customers can draw on this real-world experience to help support similar enterprise needs.

The Cisco IT Network and Data Center Services organization is responsible for evaluating Cisco networking products to determine if they can help achieve Cisco IT business strategies and align with specific technical requirements. As an early field trial participant of the Cisco ASR 1000, this organization was well placed to evaluate the technical benefits of the product for the future needs of Cisco IT.

Challenge

Globalization, company growth, and proliferating rich-media applications are all factors driving the ongoing Cisco network expansion. With over 400 branch offices and 22,000 home-based workers spread throughout the world, Cisco now routinely uses virtual meetings via video and collaboration tools such as Cisco WebEx®. Virtual meetings and web conferencing have proven so cost-effective and time-efficient that Cisco has expanded its video footprint to include Cisco partners and customers. Cisco TelePresence®, offering high-definition video on large screens, allows face-to-face virtual meetings and collaboration between employees, customers, and suppliers. Extranet partners, who account for over 80 percent of Cisco business, access resources securely over dedicated connections or VPNs. Increased traffic from all these sources was also putting pressure on the Cisco network backbone and its connections to the Internet. The challenge was how to maintain the same excellent user experience and high resiliency in the face of expanding demand for network services.

Company growth has also affected IT services. Although IT resources are in short supply, servers and applications were growing at over 20 percent a year. Cisco needed a scalable, resilient network infrastructure that supports its strategy to transform computing, storage, and networking into an Infrastructure as a Service offering.

Solution

The Cisco ASR 1000 Series Aggregation Services Routers are a portfolio of midrange routers delivering a highly reliable WAN edge solution where information, communication, collaboration, and commerce converge. Deployments began two years ago, and the ASR 1000 now addresses challenges in nine different application areas:

1. Internet edge, connecting Internet Point-of-Presence (IPOP) sites to service providers
2. Cisco Virtual Office head-end solution for home-based Cisco workers
3. WAN aggregation for Cisco branch offices
4. Core router for the Cisco backbone, the nerve center of the business
5. WAN aggregation for Cisco extranet partners
6. Branch office router for large Cisco branch offices
7. Voice/video gateways for Cisco TelePresence
8. WebEx node
9. Head-end and tunnel aggregation for IPv6

Cisco IT aligned ASR 1000 deployments with its fleet management hardware upgrade program. The first ASR 1000 deployments were in two application areas: upgrading Internet edges, and replacing Cisco Virtual Office head-end solutions for home-based workers. “The ASR 1000 gives us the flexibility to scale as traffic demands at the edge increase,” says Jawahar Sivasankaran, senior manager, IT Customer Strategy and Success. “We can upgrade the ASR 1000 WAN connection from T1 to T3 to OC3 to OC192, without a forklift hardware replacement,” says John Moe, senior architect and member of technical staff within the Network and Data Center Services team. ASR 1000 routers are also ideally suited for the Internet edge, because their firewall capabilities can handle up to 40Gb/s throughput.

As fleet replacements continued, Cisco IT installed ASR 1000 routers in other locations, including aggregating WAN traffic from branch offices, aggregating extranet partners using dedicated leased lines or VPNs, and as standalone solutions for large branch offices. The ASR 1000 was also a good fit for core router locations requiring OC3, OC12, OC48, or 10 Gigabit Ethernet capacity. The in-service software upgrades and high hardware and software availability to help ensure nonstop router operation are key advantages for a large-scale global deployment (see Figure 1).

The ASR 1000 also acts as a voice/video gateway for several business-to-business Cisco TelePresence locations, allowing major enterprise customers to communicate directly with Cisco via high-definition video.

In several locations, Cisco IT deployed the ASR 1000 with the Cisco WebEx Node capability. The WebEx Node for the ASR 1000 Series is an optional shared port adapter that integrates transparently with the Cisco WebEx Collaboration Cloud network. The adapter runs WebEx software that enables it to act like a private extension of the WebEx-hosted service. The WebEx Node communicates securely with the WebEx Collaboration Cloud via Secure Sockets Layer (SSL) encryption.

Cisco was also entering the next phase of its IPv6 implementation, which called for native IPv6 transport in the network core, and IPv6 tunnels to the five Cisco regions (see Figure 2). Cisco IT installed five ASR 1000 routers that currently tunnel IPv6 traffic in IPv4 packets. Over time, the plan calls for all IPv6 tunnel headends to move to a dual-stack approach, supporting both native IPv6 and IPv4.

Figure 1. Cisco Global WAN Backbone in 2010, with ASR 1000 Series Routers Providing Links via 10 Gb/s, OC48, OC12, and OC3 Connections

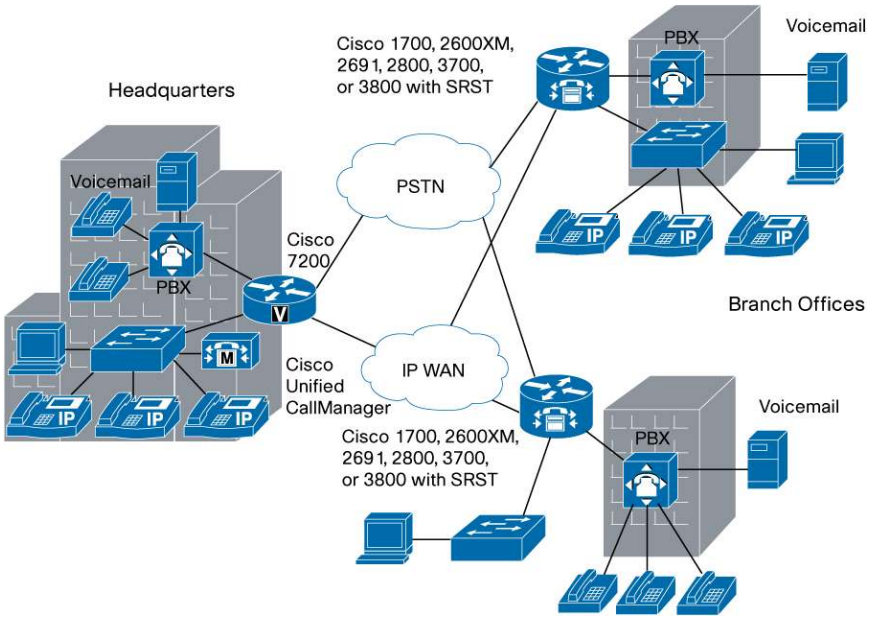
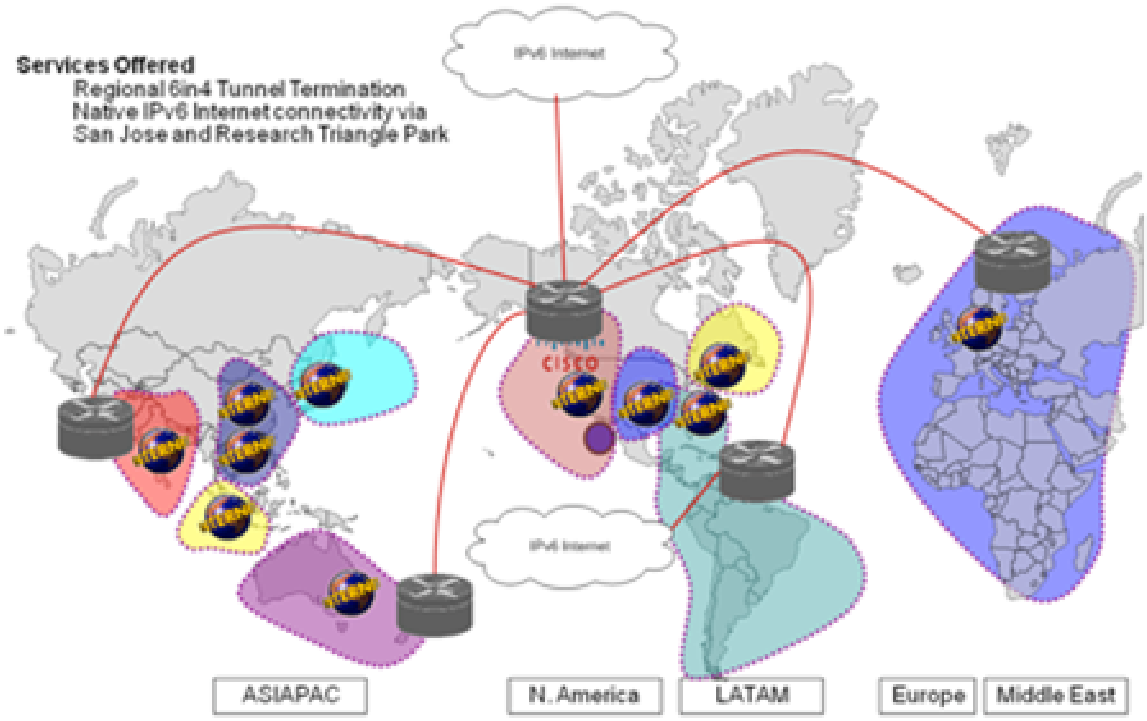


Figure 2. Cisco ASR 1000s Deployed as IPv6 Tunnel Headends in Five Locations Worldwide



Results

The ASR 1000 Series routers are an important component supporting Cisco global expansion, while simultaneously avoiding costs through better WAN utilization. Cisco embarked on a multisite data center program in 2008 to address challenges of capacity, business resiliency, and geographic risk. The Global Data Center Program built two new data centers and retrofitted three more to serve the global needs of its employees and partners. With virtualization and cloud computing as important components of this program, several applications were migrated from Cisco headquarters in San Jose, California, to two new production data centers in Texas. The ASR 1000 routers, connected by 10 Gigabit Ethernet, provided the necessary platform for this migration. “The ASR 1000 was instrumental in transferring an enormous amount of data and business applications from San Jose to Texas,” says Moe. “Thanks to increased the network capacity, performance, and robustness, 25,000 San Jose employees now access several applications that reside natively in our Texas data centers,” says Sivasankaran.

The ASR 1000 was an important component in a WAN optimization program that is projected to save Cisco US$80 million over three years. The capacity and resiliency of the ASR 1000, combined with service virtualization capabilities embedded in Cisco Integrated Services Routers Generation 2 (ISR G2) in the branches and Wide Area Application Services capabilities, helped Cisco IT relocate applications to centralized data center locations, eliminating hardware redundancy and reducing maintenance costs.

The ASR 1000 is also instrumental in improving user access to collaborative applications. The ASR 1000 WebEx node deployments maintained the integrity of the user experience while reducing bandwidth consumption, allowing more room for traffic from other rich-media applications. ASR 1000 routers also helped support the expansion of

Cisco TelePresence, currently numbering over 1100 locations.

Lessons Learned

Long-range planning by Cisco IT reduces duplication and improves IT efficiency. As part of its lifecycle infrastructure and management program, Cisco IT plans for refreshes two to three years in advance. “Long-range planning helps us closely align network infrastructure deployments such as the ASR 1000 with other technology architectures such as collaboration and data center consolidation, reducing duplication in our software management processes,” says Sivasankaran. “Timing network upgrades with application or data center changes also improves user experience.”

Next Steps

Close to a hundred ASR 1000 routers have been installed, with more coming online every quarter. As Cisco global locations expand, the ASR 1000 will play a key role in improving operational efficiency while reducing operations costs. “The capacity, flexibility, resiliency, and improved bandwidth utilization of the Cisco ASR 1000 routers support our goal to expand high-end video locations from 6,000 to over 20,000 in the next 18 months,” says Sivasankaran. “They will also play a key role in our journey to a more virtualized network experience, where workers can access applications on any device in any environment, enhancing collaboration and productivity.”

For More Information

To read more about Cisco ASR 1000 Aggregation Services Routers, visit www.cisco.com/go/asr1000.

To read additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit

Note

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