

Cable & Wireless—Delivering Converged IP Services with End-to-End Quality of Service to Enterprises



CABLE & WIRELESS

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– Tony de Vizio, Product Manager for Cable & Wireless’ IP-VPN QoS service

The Cable & Wireless IP-VPN QoS solution, a Cisco Powered Network, heralds the true realization of IP business benefits for WAN communications. Cable & Wireless IP-VPN QoS underlies the strategic relationship, announced in April 2002, between Cisco Systems and the global telecommunications group Cable & Wireless™. The decision to partner with Cisco to build a global IP network with Quality of Service (QoS) was based on Cable & Wireless’ many years of joint networking experience with Cisco. In addition, the ability to offer converged telephony, web, videoconferencing and other IP applications, together with the flexible deployment and management features of Cisco’s IOS software, will provide business customers a highly secure and cost-effective solution portfolio of services.

Prominent among the Cisco IOS® Software features in Cable & Wireless’ IP network infrastructure are QoS and Multi-Protocol Label Switching (MPLS) capabilities to support the specific requirements of data, video and voice applications over IP. Customers already benefiting from these enhanced IP services include leading UK retailer Marks & Spencer and one of the world’s leading suppliers of branded foods, H.J. Heinz.

Expanding Value and Benefits with Classes of Service

Launched in 2002 in the US, mainland Europe and Japan, IP-VPN QoS builds upon its in-depth market experience, having been available to UK business customers since October 2000. Cable & Wireless is able to offer a global service that truly reflects customer expectations in terms of service features, technical performance and service management.

The network is built with high capacity Cisco routers at the core that provide performance of up to 10 Gbit/second. This will ensure that Cable & Wireless continues to offer one of the highest network core capabilities in the marketplace.

Further Cisco routers, such as the Cisco 10,000 Series edge routers, deliver services from provider edge to the customer edge. The Cisco Catalyst® 6500 Series switch has also been deployed at points of presence (PoPs) to provide separation of the switching and aggregation layers. This enables optimization of local switching and a reduction in the impact of upgrades or expansions to other elements of the PoP. At the customer’s premises, a wide range of Cisco routers can be deployed for final connectivity depending on the specific performance and interface requirements at each location.

Since the inception of the network, QoS was in place to guarantee that traffic reached its destination within specified timeframes.

Technology refinements such as MPLS have combined to make IP networks more intelligent and faster, without sacrificing reliability, enabling not just enhanced QoS but the ability to offer classes of service.

Certain types of network traffic can be grouped together into Classes of Service for customers. Cable and Wireless IP-VPN QoS currently offers three Classes of Service, although this is likely to increase in the near future:

- Standard for non-critical traffic, such as email and web browsing
- Enhanced for business critical traffic, such as financial transactions
- Premium for delay sensitive applications, such as voice and video

Each Class of Service has its own service level targets with respect to availability, latency, jitter and packet loss. This gives customers a more robust solution when compared to some other service providers that only can deliver "best effort" assurances. Cable & Wireless has been awarded Cisco's V3PN Certification, an SLA accreditation for global QoS, which indicates to customers that Cable & Wireless IP-VPN QoS is capable of accommodating complex business and multimedia applications.

"What our customers really want are full service level agreements for each Class of Service for the efficient transport of applications," says Tony de Vizio, Product Manager for Cable & Wireless' IP-VPN QoS service. "Cable & Wireless delivers that capability. With Cisco as a key technology partner, we're now perfectly positioned for the global market with a leading product and service offering."

De Vizio believes the Cable & Wireless MPLS backbone and the IP-VPN QoS service are the key for businesses wanting to move their networks away from just being a cost line on their balance sheet to a real business asset.

EXECUTIVE SUMMARY

BACKGROUND

Cable & Wireless is a major global telecommunications business with revenue of over £5.9 billion (US \$8.6 billion) in the year to 31 March 2002 and customers in 80 countries. It consists of two core and complementary divisions: Cable & Wireless Regional and Cable & Wireless Global. Cable & Wireless Regional offers a full range of telecommunications services in 33 countries around the world. The Cable & Wireless Global focus is on IP (Internet protocol) and data services and solutions for business customers. It has developed advanced IP networks and value-added services in the US, Europe and the Asia-Pacific region in support of this strategy. With its financial strength and the capability of its global IP infrastructure, Cable & Wireless holds a unique position in terms of global coverage and services to business customers. For more information about Cable & Wireless, go to www.cw.com. A Cisco Powered Network, Cable & Wireless deployed an IP network with multi-protocol label switching (MPLS) at its core in 2000.

CHALLENGE

Customer deployments of MPLS-based IP virtual private networks (IP-VPNs) and converged telephony and data applications in the United Kingdom convince Cable & Wireless customers globally of the viability of converged IP services with MPLS and quality of service (QoS) features. These services are expected to be in use by a myriad of customers in the UK in the next few years. Cable & Wireless now offers converged IP services globally to multinationals and other businesses.

CISCO SOLUTION

A joint technology and marketing relationship between Cable & Wireless and Cisco Systems, announced in 2002, is dedicated to the expansion of advanced IP networks and value-added services in the United States, Europe and the Asia-Pacific region. Cable & Wireless, with Cisco's help, has expanded its MPLS-based IP network with additional Cisco 12000 and 10000 Series Internet routers, Cisco 7500, 7200 and 3600 Series routers and Catalyst 6500 switches, all running Cisco IOS Software.

RESULTS

Cable & Wireless now offers IP-VPN solutions in 65 countries and the company expects to expand services to 80 countries by 2003. The company has packaged IP services in three different categories. *IP-LAN service* carries email, Internet and intranet traffic, and other types of data traffic that can be encapsulated into IP, including voice, audio and video. The service offers different contract management options and can scale to accommodate thousands of users. *Voice over IP service* converts circuit-switched voice calls for transmission as packet-switched signals over an IP network, the same one used for data and video communications. *IP-VPN QoS service* is a managed VPN a secure network that carries data, voice, telephony, and video traffic between offices, partners, and suppliers with an optional firewall-protected connection to the Internet and Extranets.

This is because efficiencies in routing and simplified provisioning are possible. In addition, many value added services including IP security protocol (IPsec) inter-working, network-based firewalls, intranet and extranet capabilities, Public Key Infrastructure (PKI) management, enhanced security for dial-up access, converged applications and centralized network management and provisioning are available with Cable & Wireless IP-VPN QoS. This is a result of combining leading edge equipment from Cisco and respected 24 x 7 service management support from Cable & Wireless with joint development work from both organizations to create a complete and highly attractive IP-VPN QoS service package for customers.

"During the next three years, we will see IP emerging as the single infrastructure businesses will use to carry all kinds of traffic because of its inherent cost efficiencies and flexibility," says de Vizio. "Businesses interested in saving on future infrastructure and communications costs will use IP. We're expanding our IP network globally to offer more intelligent and more efficient networking services to companies that need to improve communications between employees, customers and partners globally."

The majority of the world's largest and mid-sized companies are expected to take advantage of reliable, end-to-end converged IP solutions from service providers such as Cable & Wireless. Retailer Marks & Spencer became the first customer in the UK to benefit with an IP-VPN QoS that increased the company's network capacity thirty-fold.

This in turn increased the speed of payment processing, customer ordering, stock ticketing, email, and personnel management systems.

By choosing Cable & Wireless to deploy and maintain IP-VPNs for secure, high-speed communications between their offices and stores, Marks & Spencer was able to put services in place swiftly and avoid incurring high development and capital costs. By working closely together to understand

Figure 1. Cable and Wireless Global IP Network



business needs, Cable & Wireless made it possible for Marks & Spencer to jump straight to an IP network from its legacy systems; a jump it had not envisioned being able to make, but which enabled a quicker realization of their long-term strategy.

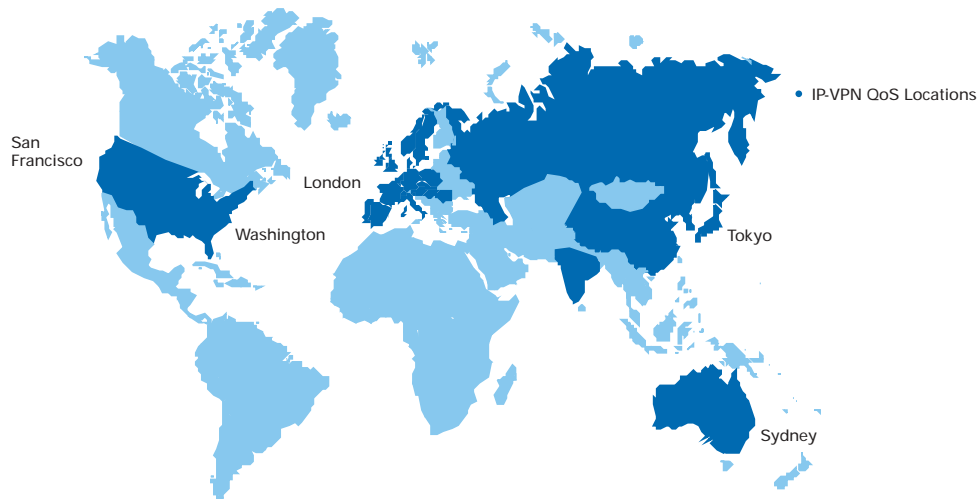
“The convergent communications solution has produced scalable, tangible business benefits,” says Adrian Pratt, Technical Consultant at Marks & Spencer. “The increased capacity on the new network means that we will be able to quickly and easily add innovative voice and video applications in the future.”

Branded food supplier H.J. Heinz chose Cable & Wireless to provide a new pan-European network that converges data and voice communications over a single IP network for Heinz offices. IP local area networks (LANs) and Voice over IP (VoIP) capabilities were first implemented in three of Heinz’s UK offices. The offices were connected via Cable & Wireless’ IP-VPN QoS network, and managed with the QoS features of Cisco IOS Software to give priority and management features to different classes of traffic.

MPLS and QoS Features Make Global Service Viable

MPLS is the main reason why IP-VPN services can now be offered easily and cost-effectively by service providers. In the past, VPNs based on Frame Relay or asynchronous transfer mode (ATM) required that permanent virtual circuits be built and maintained between the separate sites that were to be connected. This was an expensive deployment and required high costs for maintenance and support. Traffic flowed through the network hub from each site and then back out to its destination, even if two sites were in the same city and the hub was in another time zone. The previous method of IP routing for VPNs was also cumbersome, with each router having to extract the relevant forwarding information from the Layer 3 header of each packet. This information became an index for a routing table lookup determining the packet’s next hop, and so on from router to router across the network.

Figure 2. Cable & Wireless IP-VPN QoS



With MPLS, IP-VPN connections can be quickly configured and managed by service providers or through Web interfaces available to customer network administrators. The packets are switched within the network, instead of routed, for much better performance. A short, fixed-length label is included with each packet. The switches in the network backbone perform table lookups based on the labels and determine where the packets should be forwarded. The Layer 3 header is then analyzed at the edge router one time only. At the packet's destination, a customer premise router swaps the label for the appropriate header data linked to that label. Thus, MPLS enables routers and switches to make forwarding decisions more quickly.

"The flexibility and feature richness of Cisco IOS Software's routing capabilities give us confidence in our ability to scale and enhance the networks for customers in the future," says Tony de Vizio. "And the QoS we can offer is one of the most important differentiators for us." Additional QoS features in the Cisco network allow Cable & Wireless to monitor the classes of traffic and bandwidth precisely for customers to verify service level agreements. Customers can ramp their guarantees up or down as necessary, based on seasonal variation or special application usage spikes or lows. They pay only for what they use and do not have to maintain the same classes of service and expensive virtual connections for Frame Relay or ATM VPNs of the past.

The Global Rollout

"We plan to provide both fully managed LAN and WAN infrastructure on a single IP platform on a global basis," says Rob Coleman, Director of Alliance Marketing at Cable & Wireless. "A primary goal is the smooth migration of customers with convergence requirements away from legacy services and onto IP."

Cable & Wireless is extending the IP-VPN QoS service throughout Europe, the USA and Japan. The architecture in the UK, which has been providing service since October 2000, has become the reference architecture for regions around the globe. Future bundled service offerings will include combined IP transport with PKI, dial and fixed access.

"Together, these services offer businesses the ability to converge their data and voice networks and VPNs over a single IP infrastructure, avoiding the time and expense of building, maintaining and operating several networks," says Adrian Pickering, Regional Channel Manager for Cisco Systems. "Through our relationship with Cable & Wireless, businesses throughout the world will be able to move to greater network performance, demonstrable cost savings and increased productivity."



Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems Europe
11 Rue Camille Desmoulins
92782 Issy-les-Moulineaux
Cedex 9
France
www-europe.cisco.com
Tel: 33 1 58 04 60 00
Fax: 33 1 58 04 61 00

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

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