CISCO SYSTEMS

Customer Success Story

Cisco IP/Multiprotocol Label Switching Technology
Helps BT Infonet Reap the Benefits of an Interprovider

EXECUTIVE SUMMARY

CUSTOMER NAME

- BT Infonet is a leading provider of valuable global communications services to thousands of multinational companies. Clients choose BT Infonet because of solutions that deliver the communications technology they need to carry out their strategic initiatives, globalize their applications, maximize their return on investment, and more effectively manage their network and infrastructure costs. BT Infonet provides the framework to understand customer needs and to offer global solutions tailored to match the specific business strategies and objectives of its customers.

INDUSTRY

- Global network operator

BUSINESS CHALLENGE

- Spread network reach throughout the world cost-effectively to service multinational customers

NETWORK SOLUTION

- The Cisco IP/MPLS Inter-AS solution enables the simple transport of data, voice, and video traffic across multiple subnets with QoS and CoS characteristics intact.

BUSINESS VALUE

- Cisco IP/MPLS Inter-AS has broadened BT Infonet's network and the networks of a dozen regional partners on five continents, enhancing their competitiveness with global carriers as they cost-effectively use Cisco IP/MPLS VPN technology.

Now part of the global BT family, BT Infonet, based in El Segundo, California, has been among the first networks to deploy Cisco Systems® IP/Multiprotocol Label Switching (MPLS) interprovider extensions to Cisco IOS® Software. The next-generation network technology has turned BT Infonet into an interprovider of end-to-end, multimedia IP traffic transport with quality-of-service (QoS) and class-of-service (CoS) capabilities. Cisco® IP/MPLS interprovider technologies, part of the Cisco IP Next-Generation Network architecture, enable regional carriers to interconnect with global carriers, such as BT Infonet, for the mutual benefit of increased points of presence (PoPs).

EXTENDING THE REACH OF CISCO IP/MULTIPROTOCOL LABEL SWITCHING VPNS

BT Infonet implemented Cisco MPLS Inter-Autonomous System (Inter-AS) in 2001 and deployed it for three "autonomous systems"—BT Infonet, Bell Canada, and KDDI of Japan the following year. Cisco MPLS Inter-AS makes it easier to set up peering agreements between two or more carriers through IP/MPLS VPNs at the provider edge. The technology allows for the remapping of the QoS and CoS attributes of interprovider partner traffic across global and regional subnets through interlinked IP/MPLS VPNs.

"We started interconnecting single-class traffic in 2001," says Joe Fusco, Director of IP Services, BT Infonet. "Then in 2002, we mapped everything to an assured forwarding class with low-latency queues. Back then, people used MPLS without classes of service, and most were used to and familiar with the 'best effort' delivery that was common for IP traffic."

According to Fusco, greater familiarity with IP/MPLS changed that. Customers became more and more accustomed to QoS and traffic differentiation.

"Cisco IP/MPLS interprovider extensions gave us the ability to hand off the packets with the MPLS information between two or more different networks and to keep the header intact," Fusco says. "Previously, you had to strip off and reapply the routing and QoS information in the MPLS header at the edge of the network. With the Cisco interprovider solution, the second network doesn't have to put another complete MPLS header on it. It looks like a single VPN despite the fact that it's on two separate networks."

BT Infonet uses Cisco 7500 Series routers to connect to its dozen interprovider partners, including Bell Canada and KDDI, both of which are Cisco IP/MPLS networks. The interconnects in Canada, Japan, Australia, and other locations offer customers in those countries the benefits of the broad local coverage of their national provider and global connectivity with BT Infonet—all in a nearly transparent MPLS VPN. This enables regional providers to sell robust, global access to multinational companies or those seeking an international presence.

DIFFERENT INTERCONNECT OPTIONS

BT Infonet and its interprovider partners have chosen different connection options, based on IETF standards. With Japanese carrier KDDI, VPN routing and forwarding (VRF) instances are exchanged between gateway routers referred to as autonomous system boundary routers (ASBRs). In this model, ASBRs are directly connected over a physical interface or subinterfaces and VRF instances for each VPN that is provisioned. A remote ASBR is seen as an additional customer edge router within each interautonomous system VPN, allowing usage of any provider edge–customer edge routing protocol. VPN traffic can be forwarded between ASBRs as IP packets, and VPN routes can be exchanged using Exterior Border Gateway Protocol (EBGP) or Interior Gateway Protocol (IGP).

With interprovider partners such as Bell Canada, the provider edge routers of each carrier are configured with Multiprotocol BGP (MBGP). Using MBGP, the classes of service for each carrier customer can be more flexibly mapped to different class designations.

> **"Our global customers are increasingly demanding near-transparent connectivity for end-to-end services across network boundaries and, most importantly, a single point of contact for these services rather than going to various providers for a solution. We're excited about the Cisco interprovider offering, with its multicast, traffic engineering, and load-balancing capabilities. This is one step closer to our vision for the next-generation network with global interconnectivity and higher customer satisfaction."**
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> —Joe Fusco, Director of IP Services, BT Infonet

The first method is difficult, according to Fusco, because the traffic characteristics to which one provider adheres have to match the traffic characteristics of another provider. He prefers the second method. "By exchanging route information and labels across the provider edge routers, you don't have to configure a VRF instance for every customer," he says.

The Cisco use of Differentiated Services (DiffServ) makes the need for a network reservation signaling protocol unnecessary. Each traffic class is indicated on the packet, using the 6-bit DiffServ code point (DSCP), which is part of the CoS field in the IP header.

The first interprovider partner to use CoS features was Cegetel of France in 2004. Since then, many of the other partners have migrated to the five standard service classes, although some still use a single class of service.

PROVIDING COMPETITIVE VALUE

"Historically we provided Frame Relay international services through BT," says Nicolas Tarin, Marketing Manager for data services at Cegetel, based in Paris. "We put out a request for proposals to several international telecoms, and BT Infonet won because it provided an IP VPN MPLS solution, which we wanted to position as a transparent extension of Cegetel. We also didn't want to give business to competitive telecoms, which could compete against us for our European customers."

"We don't allow the carriers on each end to use us as a transit network because there's no business model to support that," says Fusco. "The traffic is not traversing BT Infonet's backbone; it's a port-to-port model."

Cisco IP/MPLS, with its enhanced interprovider capabilities, is part of a three-to-five-year Cisco IP Next-Generation Network vision, in which network, service, and application convergence becomes a widespread reality. The Cisco IP Next-Generation Network technology emphasizes flexibility, leading standards, and industry-accepted protocols to allow customers to take advantage of multicast, traffic engineering, load balancing, and new levels of management across networks.

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