

Global One— **First to Offer Global MPLS-Based IP VPN Service**



A Member of the France Telecom Group



“The Global IP VPN service allows our customers to rely on a private network for their WAN connectivity globally. It gives them secure IP connectivity between sites and with the same policies enjoyed in a private network. Businesses that run their corporate networks over Global IP VPN enjoy the same security and prioritization they’ve come to expect with their own private networks, but with improved manageability, reliability, and performance offered by IP VPN service.”

—Mark Gallo, Senior Manager, IP Product Engineering at Global One.

In August, 1999, Global One launched the industry’s first MPLS-based IP VPN service, and today, Global IP VPN offers by far the most extensive global coverage of any MPLS-based IP VPN service. Global IP VPN is available in 35 countries with native MPLS access, in 75 countries with Frame Relay access, and virtually worldwide with integrated, secure IPSec tunneling over the Internet.

Global One is also at the forefront of Voice over IP (VoIP) with Global IP VPN. The VoIP service is provided using the Global IP VPN Multimedia class of service (CoS) and is integrated with the Global One circuit switched voice VPN service in 30 countries to offer the most flexible combination of on-net and off-net services.

EXECUTIVE SUMMARY

BACKGROUND: Global One offers a single source for high-quality IP, data, and voice telecommunication services worldwide, with a primary focus on the multinational business market. A recognized leader in providing integrated e-business solutions to meet customers’ enterprise-wide needs, Global One has one of the world’s most advanced global broadband networks to support convergent services and applications. Global One, a member of the France Telecom Group, has a local sales presence in more than 70 countries and had revenues of US\$1.1 billion in 1999.

CHALLENGE: Global One has made substantial capital investments amounting to more than US\$2 billion in the last four and a half years. Much of this total has been spent on advanced network infrastructure. Paving the way for the next generation of convergent services, Global One and France Telecom have built a global broadband network capable of supporting the fast-growing volumes of Internet, data, and voice traffic demanded by today’s large multinational companies. Much of this network consists of fiber optic infrastructure with capacity in excess of one terabit per second.

In recognition of its pioneering role, *Network Magazine* named Global IP VPN “VPN Product of the Year 2000” and *Network Computing Magazine’s* Asian edition gave it a similar award.

Over 30 major international customers have signed up for this leading MPLS-based IP VPN global service. These customers benefit in many ways from the e-business enabling communication solution. Its scalability means that it grows easily with a customer’s expanding business requirements worldwide. Simplified administration with automatic any-to-any connectivity provides great

management flexibility to support organizational change. The Global One dedicated bandwidth and the MPLS-based VPN functionality provides

security similar to that of Frame Relay or ATM-based VPNs. Excellent quality of service (QoS) comes from the three unique, prioritized service classes, backed by service level agreements (SLAs). Award-winning customer service and exceptional performance offer customers real value.

Focus on Global eSolutions

Global One, a member of the France Telecom Group, offers a single source for high-quality IP, data, and voice telecommunication services worldwide, with a primary focus on the multinational business market. A recognized leader in providing integrated e-business communications solutions to meet customers' enterprise-wide needs, Global One has one of the world's most advanced global broadband networks to support convergent services and applications.

The corporate business customers of Global One require communication solutions that serve not only their own needs, but also those of their customers and supply chain partners—their communities of interest. Global IP VPN is designed specifically for this purpose.

Advantages of the MPLS-based IP VPN Solution

Global One pioneered Global IP VPN to give its multi-national customers the benefits of Internet Protocol (IP) with the security of a private network. Using IP, Global IP VPN provides automatic any-to-any connectivity and great flexibility. The use of MPLS technology allows the classification and prioritized forwarding of mission-critical traffic according to each customer's unique requirements. With MPLS, service providers and end customers benefit from the new ease

EXECUTIVE SUMMARY

CHALLENGE (continued): In North America, France Telecom has announced an investment of US\$200 million to build a 28-city, 15,000-mile North American fiber optic backbone network, which will serve Global One and other members of the France Telecom Group. Scheduled for completion by the end of 2001 with a capacity of 1.6 Tbps, it will provide worldwide coverage via interconnection with the world's major submarine cables. It will interconnect, for instance, via TAT-14 with France Telecom's European backbone network, another high-speed fiber optic network connecting 250 cities in 16 European countries.

CISCO IOS SOFTWARE SOLUTION: Using features of Cisco IOS Software, such as Multiprotocol Label Switching (MPLS) and QoS, along with Cisco hardware, Global One launched the Global IP VPN service in August 1999. It provides high quality access to corporate intranets and extranets, allowing business customers to run IP-based mission-critical applications (including databases, file transfer, voice, and multimedia) over VPNs on a private fiber optic infrastructure.

RESULTS: Global IP VPN service brings Global One customers a variety of benefits including: reliability; scalability; any-to-any connectivity; greater economy than using traditional leased lines or Frame/ATM services; a choice of differentiated classes of service; easy development of connections to add new branches; guaranteed service levels and security on a par with existing Frame/ATM services; and multiple means of access to the network, including dial access, Frame/ATM, leased line, and Public Switched Telephone Networks (PSTNs). Global IP VPN is also an integrated platform for adding services such as voice and video over IP.

and scalability of deployment, new class of service options, and improved performance for all types of applications.

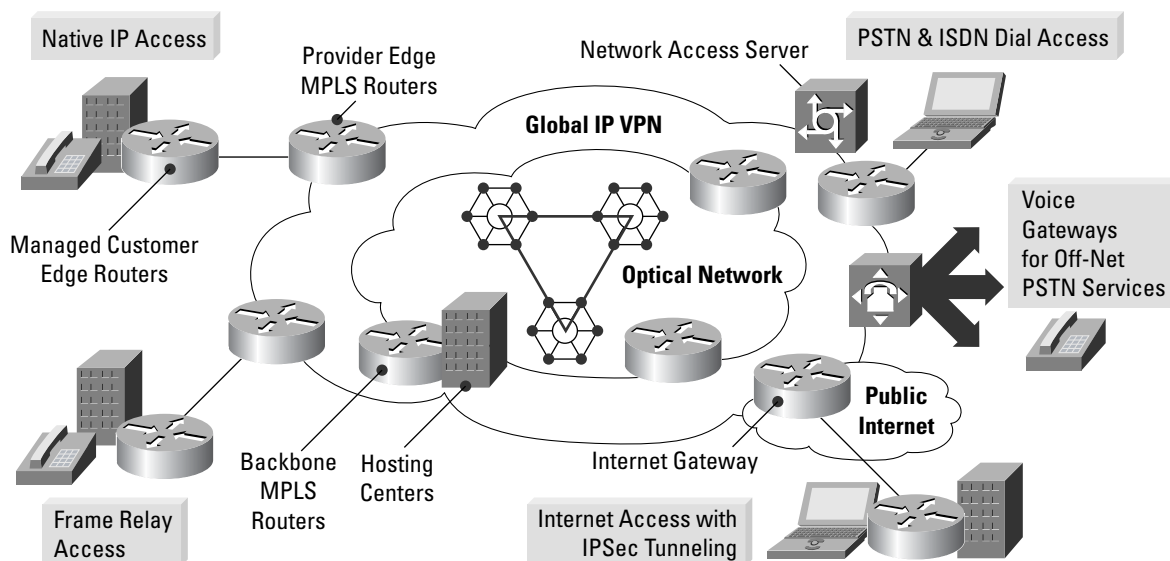
With an ATM or Frame Relay network, virtual circuits must be manually provisioned between separate sites to allow them to communicate. However, using MPLS for an IP VPN enables automatic any-to-any connectivity and easier management through deployment of scalable Layer 3 VPN backbone services.

“With Frame Relay, the customer has to provision permanent virtual circuits, whether they use them or not,” says Jean Critcher, Global One Product Manager for Global IP VPN.

“These connections have to be sized, configured, and managed for each pair of offices that communicate directly. With MPLS, the service router controls all of the labeling. The outer determination is done at Layer 3, the network layer, and then packets are switched instead of routed within the network core.”

MPLS is an emerging open standard based on Cisco tag switching. The main concept of MPLS is to assign short, fixed-length labels on each packet. Switches perform table lookups based on these simple labels to determine where data should be forwarded.

By contrast, conventional Layer 3 IP routing involves complex forwarding analysis for every packet. As a packet traverses a network, each router extracts all of the information relevant to forwarding from the Layer 3 header. This information is then used as an index for a routing table lookup to determine the packet's next hop. This is repeated at each router across a network. At each hop in the network, the optimal forwarding path of each packet must again be determined.



With MPLS, the processor-intensive detailed analysis of the Layer 3 header is performed only once, at the edge label switch router, which is located at each edge of the network. Only the fixed length label of the incoming packet is examined to send the packet on its way. At the other end of the network, a customer edge router swaps the label out for the appropriate header linked to that label. A key result is that forwarding decisions can be achieved through a single table lookup from a fixed-length label. This enables MPLS to empower routers and switches to make forwarding decisions based upon multiple destination addresses.

MPLS technology also creates QoS advantages for end customers. MPLS encapsulates and assigns labels to IP packets according to VPN IDs and pre-established CoS. The IP network routers then use packet labels to switch packets based on the priority assigned in the label. By switching packets according to the priority assigned, carriers are able to create a set of pre-defined paths for different classes of traffic to ensure optimal traffic engineering, resulting in QoS advantages for end customers.

Enabled by a Cisco Powered Network Infrastructure

The Global One Cisco network infrastructure consists of Cisco 7500 series routers at the network edge and in the network core. These backbone Provider and Provider Edge routers are located in over 100 cities and 35 countries (a total of 40 countries will be available in 2001). Customer Edge routers are typically Cisco 1750, 2600, 3600, and 7200 models. Remote dial access is also available via Global IP Dial in over 50 countries.

“We recommend that our customers use Cisco routers because they’re built to easily add multimedia services, like voice over IP,” says Mark Gallo.

Leveraging the benefits of MPLS, Global IP VPN offers three classes of service (CoS) to ensure differentiated QoS based on the unique needs of different network applications. These service options include Multimedia (for Voice or Video over IP), Premium (for time-sensitive data applications), and Standard (for throughput-oriented applications, such as file transfers and e-mail). QoS is also backed by the Global One Guarantee Program, which provides worldwide

SLAs and award-winning customer service. The service's exceptional performance with low total cost offers customers an excellent value.

The European Commission, the automobile manufacturer Renault Spain, and over 30 other companies are already using the service. Global One is aggressively promoting the service in seminars around the world.

"For many of our global customers who have primarily IP traffic, it's more efficient and cost-effective to go with an MPLS-based IP VPN instead of using Frame Relay," says Jean Critcher. "Global IP VPN is especially well suited to businesses that have many sites to connect and need to prioritize different applications end to end across the network. The MPLS-based service is easy to implement and administer. Permanent virtual connections that are typically associated with Frame Relay or ATM are more difficult and more expensive to manage, upgrade, and scale than the connectionless infrastructure using MPLS."

Within the next several years, as QoS and security capabilities improve and IP becomes the dominant enterprise application protocol, the worldwide IP VPN

market is expected to grow from an estimated \$5.1 billion in 2000 to \$35.9 billion in 2004 according to recent research by the Infonetics. "Companies want communication solutions that are as flexible as the marketplace demands them to be: equally optimized for internal corporate applications and external partner and e-commerce applications," says Tom Wyrick, Vice President of Market Development at Global One. "Global IP VPN is optimized for the full scope of e-business applications, including supplier, partner, and customer segments—exactly what today's businesses require." Global One is enhancing Global IP VPN with applications such as Global Web Hosting, eCollaboration, videoconferencing, and other Web-based applications.

"Our customers are very happy with the reliability and performance of Global IP VPN, even though in the first few months of rollout we had some early implementation 'challenges'," says Mark Gallo. "Cisco has been very responsive to every issue along the way."



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