Ascend

FAQ

Virtual Private Networks with IP Navigator

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1. ***What is IP Navigator?***

   IP Navigator adds full IP routing capability to Ascend's multiservice Wide Area Network (WAN) switching products to provide carrier-class IP services along with Frame Relay and ATM. It does this by combining the intelligence of connectionless-oriented Layer-3 interfaces at the edge of the network with the efficiency and Quality of Service (QoS) capabilities of a Layer-2 connection-oriented core. Ascend's IP Navigator is the only solution that allows service providers to build highly scalable switched IP WANs using native IP routing protocols such as OSPF, BGP-4 and RIP, while utilizing a high-speed ATM or Frame Relay backbone network with its inherent end-to-end Multiservice QoS and bandwidth management capabilities.

2. ***How does IP Navigator compare to other methods of switching IP in WANs such as the Ipsilon Flow Management Protocol (IFMP) and the ATM Forum's Multiprotocol over ATM (MPOA) approach?***

   These methods are basically flow-based approaches that require the use of Switched Virtual Circuits (SVCs) for all IP traffic, which is more suitable for campus environments and is not scalable in the WAN. IP Navigator is based on proven and standard routing protocols.

3. ***How does IP Navigator relate to the Multi-Protocol Label Switching (MPLS) effort currently in progress in the IETF?***

   The Internet Engineering Task Force's MPLS group is working on a standard for combining Layer-3 routing and Layer-2 switching in the WAN. Due to our expertise in this area, Ascend has been an early participant in this group and has made a substantial contribution to this proposed standard. IP Navigator is essentially a pre-standard implementation of MPLS, with important extensions for Virtual Private Networks (VPNs), Multiservice QoS and bandwidth management capabilities.

4. ***What does the VPN capability provide?***

   This VPN capability allows a single physical network running IP Navigator to represent many separate logical routing networks. Each logical VPN provides identical functionality to buying and maintaining a totally separate routing network for each customer. The capability to create many "virtual routers" on a single physical infrastructure yields savings in equipment and operations costs because of centralized management with Navis and bandwidth costs due to statistical multiplexing.

   The major applications that IP Navigator's VPNs enable are listed below:

   - **IP Connected Intranets**: Allows a company with multiple offices to connect its headquarters to securely connect to its remote offices purely via IP
   - **IP Connected Extranets**: Allows cooperating companies (for example, an auto manufacturer and its suppliers) to communicate over a public IP network while maintaining security
   - **Port Wholesaling**: Allows a large ISP to sell groups of modem ports to smaller ISPs while enforcing the routing policies needed for wholesaling to occur properly

   These capabilities, coupled with IP Navigator's Multiservice QoS, scalability and multiservice capability, create an ideal solution for the large service provider.

5. ***How is this capability different from VPNs using tunneling protocols such as ATMP, L2TP, L2F, etc.?***

   These solutions are highly complementary to each other.

   Protocols such as ATMP and L2TP provide for secure communication over the public Internet. Since the data rides over an unsecure public Internet, these protocols must perform data encryption. While protocols serve a useful purpose, the endstations must agree upon the choice of the tunneling protocol and have the available horsepower to do the encryption and decryption.

   The "virtual routing" capability of IP Navigator is totally transparent to the end systems. This virtual routing capability allows creating private routing tables that are totally separate from other routing tables. In a very real sense, each customer has a private IP network that is managed by the service provider.

6. Can private address space be used?

Yes. Since each VPN is totally separate from any other VPN, private address space can be used without any danger of announcing this private address space to the public Internet. In addition, different VPNs can use the same private address space with no possibility of conflict.

7. What are competitors doing in this area?

Today, core IP VPN functionality is just emerging. Cisco has hinted about putting VPN functionality into its Tag Switching architecture, and the Newbridge/Siemens alliance has stated that its Carrier Scale Interworking solution will provide VPN functionality. This document will be revised as more vendors provide core IP VPN capability.

The summary for the Newbridge/Siemens story is that Carrier Scale Interworking (CSI) is a proprietary solution that only scales to enterprise levels and not to the public Internet. This is because CSI is based upon MPOA, a solution that requires a separate SVC for each source-destination IP address pair. The number of virtual circuits (VCs) that their ATM network can handle makes CSI suitable for enterprise networks, but inappropriate for the Internet.

Cisco will be announcing its VPN strategy shortly and will likely claim that it is a standards-based solution that follows Cisco's own proposal in the MPLS working group within the IETF. While Cisco's proposed solution is viable (IP Navigator's approach is very similar), Cisco will have problems executing because Tag Switching must work with a number of internal routing protocols (for example, OSPF, ISIS, IGRP, EIGRP and RIP) that tremendously increase the complexity of implementation.

8. Is there a separate charge for VPNs?

No. It is included with the Summer, 1998 release of IP Navigator.

9. What is the price of IP Navigator?

The list price of IP Navigator is $15,000 per switch.

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