Ascend

FAQ

IP Navigator/Absolute QoS

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ASCEND

1. What is MultiService QoS ?

Multiservice Quality of Service (QoS) is the appropriate level of QoS for different types of IP services. The current Internet as we know it just provides one level of service known as “best effort.” But in the same way that some airline passengers demand first class, some customers are demanding new IP-based services that required higher levels of service. IP Navigator gives service providers this capability by delivering a full spectrum of quality of service levels, including the industry’s first absolute quality of service for IP. This will enable service providers to offer a “best efforts” low cost service for non-critical applications such as basic Internet access and an absolute guaranteed level of service for real-time services such as voice over IP. Relative or priority traffic based on the value of the Type of Service (ToS) byte can also be mapped to an absolute level of QoS. This capability directly affects a service provider’s bottom line. By offering the advanced services that customers want, they will be able to differentiate themselves from service providers that only offer best-effort service

2. What is IP Navigator?

IP Navigator adds full IP routing capability to Ascend's multiservice WAN switching products. This provides carrier-class IP services along with Frame Relay and ATM by combining the intelligence of connectionless oriented Layer-3 interfaces at the edge of the network, with the efficiency and 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 Wide Area Networks (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 QoS and bandwidth management capabilities.

3. 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 for all IP traffic, which is more suitable for campus environments and is not scalable in the WAN. IP Navigator is based on standard routing protocols, with nothing new and unproven.

4. How does IP Navigator relate to the MPLS effort currently in progress in the IETF?

The Internet Engineering Task Force’s Multi-Protocol Label Switching (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 pre-standard implementation of MPLS, with important extensions for Ascend’s QoS and bandwidth management capabilities.

5. What is Absolute QoS?

Ascend’s IP Navigator with Absolute QoS ensures that the most critical traffic is given guaranteed and reserved end-to-end bandwidth throughout the network. This level of service is required for delivery of real-time services normally only associated with telco-quality, carrier-class, connection-oriented switched networks. IP Navigator is able to map Layer-3 IP packets directly to Layer-2 ATM or Frame Relay circuits, therefore giving IP unprecedented levels of QoS normally associated only with ATM networks.

6. What are the market drivers behind this level of QoS?

New revenue-generating services in the next generation of the Internet will require a full spectrum of QoS features with different service levels and costs. “Best Efforts”, the “one size fits all” quality that we have today will remain for the lowest cost “background”, non-time critical applications like email and file transfer, and also for cut-rate basic internet access (the “lifeline” $9.95/month service). “Priority” service will be introduced for “better than best efforts” service, like a “business class” on an airplane. This could be used for higher priority applications, like anytime a human is waiting for a response (web browsing) or premium $29.95/month service.

There has been recent industry interest in this level of service, which some claim will be “good enough” for voice and other real time application. It won’t be, however, because it doesn’t provide guarantees, congestion and delays can still occur if there is too much priority traffic. There is also no policing or Call Admission Control (CAC). The special thing that only Ascend can do is to provide “guaranteed” QoS for IP. This will be required for wide deployment of real-time services like voice and video. We can provide the “telephone quality” low latency, low error rate, high up time normally only associated with the telephone network. This is key requirement for wide deployment of voice and other real-time services over the IP data network.

7. What are the applications that need an absolute level of QoS?

Any application that requires real-time access. Examples are voice over IP, video streaming, real investment management. These applications represent a significant revenue-enhancing opportunity for service providers, and are a major driver behind many new backbone buildouts.

8*. How does Absolute QoS compare to what Cisco is doing in the QoS area?*

Cisco has announced their future intention to support priority-based levels of QoS with the ToS byte in the IP header. This type of QoS does not provide bandwidth guarantees. Congestion and delays can still occur when there is too much priority traffic. In addition, Cisco’s stated implementation remains a hop-by-hop approach with its resultant latency and performance issues and will require that every Cisco router in the network be upgraded to fully support this capability. Cisco has not announced support for priority based QoS on their new 12000 series (GSR) router.

Ascend plans to support end-to-end ToS based QoS throughout its product line. In addition, only Ascend’s IP Navigator can deliver absolute QoS through the core WAN.

9. What is the ToS byte?

The Type of Service (ToS) byte is an eight bit field in the IP packet header which has simple indicators for relative priority and delay sensitivity.

10. Does the ToS Byte guarantee QoS?

The ToS byte provides no guarantees for bandwidth availability or latency. Congestion can still occur within high priority queues.

11. How will the ToS Byte work with Absolute QoS?

When IP packets enter a service provider’s network, IP Navigator can examine the value of the ToS byte and if required by this value, map these IP packets onto guaranteed bandwidth paths using Absolute QoS.

12. How does IP Navigator compare to Cisco's TAG switching?

Cisco's TAG switching also resembles the proposed MPLS standard with some important distinctions from IP Navigator. TAG introduces yet another unproven protocol (Tag Distribution Protocol - TDP), which is independent of the routing protocol. TAG also does not support end-to-end QoS and value added services such as VPNs. Cisco's router architecture (due to their hop-by-hop nature and latency issues) also limits the performance of TAG switching. The TAG switching architecture also has an inherent inability to prevent loops in the network. Although TAG switching is designed to utilize a Layer-2 core, it is currently not supported on Cisco's Frame Relay and ATM platforms and therefore can not be practically implemented by service providers who desire the benefit of Layer 3 edge routing combined with core label switching.

13. How is IP Navigator with Absolute QoS integrated into existing Ascend core networks?

One of the key features of IP Navigator is its multiservice capabilities. IP Navigator allows IP services to be seamlessly added to existing Ascend Frame Relay and ATM networks.

14. Is new equipment is needed to run IP Navigator?

IP Navigator is supported on Ascend's current ATM and Frame Relay WAN switching platforms, including the B-STDX 8000, B-STDX 9000, CBX 500 and GX 550.

15. When is Absolute QoS available?

Absolute QoS is available in the August 1998 release of IP Navigator.

16. Is there a separate charge for Absolute QoS?

No. It is included with the release of IP Navigator.

17. What is the price of IP Navigator?

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

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