

Data & Voice Networking Briefings

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Going global with Ethernet

So what are 'Global Ethernet' services?

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Ethernet has become the standard for LAN technology, preferred because of its simplicity, low equipment cost, high speed and multivendor interoperability. However, with its network operation traditionally confined to a single building or devices within a close geographic proximity, many predicted its demise in the early 1990s. At maximum stretch, Ethernet devices could only be a few hundred meters apart, making it impractical to connect geographically-dispersed locations. Electrical signals would propagate along a cable very quickly, but weakened the further they travelled, and were prone to electrical interference from neighbouring devices.

However, recent dramatic developments in Ethernet transport technology have alleviated these difficulties, allowing users to experience the benefits of Ethernet across longer distances. Using Ethernet in WANs is a relatively new development, and is rapidly changing the way global networks are configured.

Advances in Ethernet technology have resulted in an increase in connection speeds, greater performance and a decrease in operational costs. Network service providers have now realised that, as a long distance transport technology, Ethernet actually outperforms traditional Frame Relay and private line ATM networks. That's important because service providers must improve network speed, performance and reliability over longer distances in order to meet the growing needs of applications such as multimedia-based corporate communications, videoconferencing and VoIP.

Perhaps the main benefit from deploying Global Ethernet is that special equipment and port adaptors are not required. That means companies can standardise, reducing the cost of rolling out communications devices such as phones, DSL modems, cable modems, and set-top boxes. Fully-capable routers with high speed interfaces (T1/E1/DS3/OCN) and the ability to interface with any type of WAN connection are often much more expensive than the Layer 3 Ethernet switches and interfaces used in deploying a Global Ethernet service.

Another distinct advantage of an Ethernet-based access network is that it can be easily connected to the customer network, which is typically also Ethernet. The equipment involved in rolling out a global Ethernet network is easier to source, manage and replace, naturally leading to a reduction in the total cost of ownership.

Furthermore, with the installation of circuit termination equipment in a customer's premises, network service providers are able to deploy all of the benefits of Ethernet, regardless of the existing access speed or circuit type. The benefits of this approach include: secure convergence of multiple VLANs on the same circuit; native Ethernet VLANs bridged across serial connections; and flexible design of one-to-one, one-to-many or fully-meshed networks.

Ethernet over MPLS

Deploying Ethernet over a native MPLS (Multi Protocol Label Switching) core design opens up further benefits for larger scale networks, such as global service level agreements (SLAs) for network performance and 100 percent in-sequence packet delivery for voice and video. Now that MPLS IP has gained clear and wide acceptance as a more efficient connection service than ATM, businesses are ready to migrate to converged network services, either gradually or rapidly, based on requirements and level of risk aversion.

Some prefer the maturity of Layer 3 Private IP VPNs, while others select the familiarity and relatively easy-migration from Frame Relay to VPLS. Companies are naturally wary of new technology, however with the offering of system lockdown, in-house circuit termination equipment and a QoS agreement, global Ethernet is able to provide the best network provision on the market.

Currently, large multinational organisations and enterprises are seeking to build 'all Ethernet' networks across the globe, enabling the extension of their LANs across fully accessible Ethernet WANs. This move towards all Ethernet carriers mirrors that of carriers' desires to migrate to IP-optimised networks. IP-friendly Ethernet has quickly become the omnipresent service delivery network that can be integrated across any transport technology. Once the larger organisations have proven the cost-effectiveness and efficiency of Global Ethernet, others will follow.

As global carriers naturally migrate towards next generation Ethernet delivery service platforms, expanding their offerings in new and existing markets, they will need multi-service carrier Ethernet products that unify advanced switching and transport capabilities, thereby integrating it into a single system.

Furthermore, there are new technology developments that will add weight to the argument for universal take-up of Ethernet globally. Ethernet's support for intelligent Generalised MPLS (GMPLS) and its future compatibility with upcoming Provider Backbone Bridge (IEEE 802.1ah) provide multi-service and end-to-end carrying capability - and that should provide assurance that Global Ethernet is a future-proof and scalable solution, which will ultimately reduce the total cost of ownership.

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