Pipeline

Ethernet's Keys to the Wide-area Highway
By Jim Tindall

Over the coming months, service provider competitiveness will depend increasingly upon the ability to offer Ethernet services. After all, virtually all enterprise local area networks employ Ethernet, making seamless extension across the wide area network (WAN) a compelling offer. Ethernet also has evolved to accommodate a wide range of data, voice, and video applications over a single networking protocol. Further, from both the service provider's and enterprise's point of view, Ethernet offers a new level of cost savings by delivering greater data capacity at lower cost than any WAN alternative.

However, a successful Ethernet WAN access revolution can not propose to overthrow established first-mile infrastructure or practices overnight. To the contrary, expanding Ethernet service opportunities will depend greatly on working with what is there. Service providers seeking to develop Ethernet services face two critical imperatives.

First, providers must employ Ethernet transport equipment designed to reach the broadest possible audience, rather than a small niche. Early high-capacity Ethernet equipment that has focused only on fiber-optic access limits the addressable market to little more than 10% of U.S. businesses currently fiber connected. Successful Ethernet service penetration needs also to accommodate a preponderance of enterprise locations that will remain connected to the WAN via the copper access plant for some time to come.

Second, few enterprises are willing to accept a forklift replacement of familiar, reliable access technologies that represent sunk investments that still pay for themselves. From a return on investment and total cost of ownership vantage, many enterprises will adopt Ethernet in the WAN only to the extent that it allows them to continue leveraging the value of legacy access technologies including TDM voice, Frame Relay, and Asynchronous Transfer Mode (ATM) equipment for as long as the enterprise deems fit. Only a universal, multi-service transport solution that accommodates Ethernet, TDM, Frame Relay, and ATM access can achieve this feat.

As with most of the communications industry's history, previous-generation technologies and infrastructure tend to coexist with the next generation longer than expected, making "evolution," rather than "revolution," the mode of operation. If they hope to be successful, providers must place control of the pace of Ethernet WAN adoption into customers' hands by making it available to the widest possible market.

Ethernet transport solutions that fail to support the ubiquitous copper infrastructure cannot reach more than a small fraction of enterprise customers. Transport solutions that fail to support legacy services doom the service provider to a continued single-

service-per-access-line prison, relegating Ethernet to a role as yet another overlay network, rather than the converged multi-service transport it promises to deliver.

Using What's There: The Universal Transport Challenge
Given the continued usefulness of legacy access technology, service providers must offer Ethernet services while also supporting TDM, Frame Relay, and private line services simultaneously over a full range of copper and fiber connections. The typical enterprise will demand a mix of these access services as it migrates to pure Ethernet WANs over time. This multi-service scenario requires a universal transport solution that supports Ethernet, TDM, Frame Relay, ATM and private line access in an access-agnostic fashion.

Such universal transport solutions are already being deployed with ILECs, IXCs, CLECs and wireless operators. They are access protocol-agnostic service provider edge devices designed to aggregate any and all access traffic for transport over any core network. This any-to-any architecture affords the customer discretion over how and when to retire legacy services and migrate to advanced services like Ethernet.

The carrier employing universal transport can use any combination of existing copper, current fiber, and future fiber to capture enterprises of every size with a full slate of TDM, Frame Relay and ATM, as well as Ethernet- and IP-based Internet access, data backup, or VoIP services ranging from 1-Mbps to 1 Gbps—today and into the all-optical future.

For the service provider, the combination of circuit bonding and universal transport lowers infrastructure costs while generating immediate revenue, thereby breaking down the barriers to entry into the broadband and converged services realms. The carrier that captures underserved branch offices today with solutions they can use, and afford, will push evolution toward revolution soon enough.