

## Carrier Ethernet: When it's Right.

By Tim Young

Ethernet: From its birth in the early 1970s by Bob Metcalfe and his team as a project at Xerox's PARC, it was designed to simplify communications between machines on a common network. Its simplicity and practicality as a LAN technology enabled it to become commonplace on the local level, allowing engineers, IT professionals, and others directly involved in LANs to have a thorough understanding of its requirements and capabilities.

Therefore, when Ethernet began to stretch its legs and grow into a MAN (Metro Area Network) and eventually a WAN technology, the tech advances

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relaxed proximity requirements present in early iterations of the technology.

Therefore, the growth of Carrier Ethernet (or Metro Ethernet. The two terms are functionally interchangeable at this point in the game) has been rapid in the past 5 years or so.

A wide range of telecoms service providers have shown at least tacit interest in the growth and advancement of Carrier Ethernet as a technology through their membership in the industry forum most heavily involved in the promotion of large-scale Ethernet: The Metro Ethernet Forum. CSP members range from major North American Tier 1's (AT&T,

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An advertisement for Nakina Systems. The background is a photograph of a rusted, abandoned shipwreck on a beach. Overlaid on the image is the text: "DON'T LET YOUR NETWORK... END UP HERE. BEFORE you set sail confirm your NETWORK INTEGRITY." The Nakina Systems logo is in the bottom right corner, and the text "Find out more >> [NakinaSystems.com](http://NakinaSystems.com) Network Integrity" is at the bottom.

Verizon, and Qwest are all members, along with Bell Canada and Rogers), to European powerhouses (BT, Orange, Telecom Italia), to business-focused service and transport providers (XO, Level3), to cablecos like Time Warner.

Meanwhile, hardware manufacturers are increasingly getting into the game, with Cisco promising IP NGN Carrier Ethernet systems designed for “The Zettabyte Era.” Cisco’s products page reports that “By 2014, annual global IP traffic will reach almost three-fourths of a zettabyte (767 exabytes)”, wherein a zettabyte is equivalent to a trillion gigabytes. That’s serious traffic. And they aren’t alone. Ciena, Juniper, Alcatel-Lucent, and many others have all made Carrier Ethernet part of their plan for stronger, faster, busier networks.

But what are the central benefits and drawbacks to this still relatively-new technology?

Benefits:

The benefits of Carrier Ethernet over other comparable technologies are many.

The first, without a doubt, is cost savings. The price per MB is significantly lower for Carrier Ethernet deployments than for any of the TDM rollouts whose place it has taken.

**“So is Carrier Ethernet wrong for your business? That all depends on the business you’re in.”**

Another benefit is simplicity. Carrier Ethernet is less complex than many of its peers, and CSPs can enjoy what amounts to plug-and-play connectivity when a SONET environment would require significant work to execute bandwidth changes or expand the network.

Also, the familiarity that most engineers have with Ethernet from working with it on the LAN side is invaluable when incorporating it into the WAN.

And Ethernet isn’t a telco-only solution. As Current Analysis’ David Hold said back when Time Warner made its business-class Ethernet push, “For years, mid-sized customers have had very few alternatives to the legacy services provided by telcos,” said Hold. “Business Class Ethernet changes the game. Its widespread availability on cable HFC networks means that SMBs now have a cost effective multi-megabit alternative to telco T1 and Frame Relay data services. This service will be a real competitive differentiator for Time Warner Cable as it continues to grow its commercial business.”

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However, telcos have also embraced this technology. A quick look at the Metro Ethernet Forum's latest round of excellence awards bears this out. Top honors in the North American market went to AT&T and Verizon.

Furthermore, Ethernet is far, far more scalable than many give it credit for being. There is apparently a myth that Carrier Ethernet networks are limited in the number of VLANs available for use. That's not accurate in any meaningful way. Scalability is a strength of carrier Ethernet, by virtue of its simplicity.

Drawbacks:

Some say that there aren't many drawbacks to Carrier Ethernet, and there is some support for that position. The benefits mentioned above have made believers of large numbers of successful carriers.

There are, however, some serious considerations that should be given to whether a network should be expanded via Carrier Ethernet, or whether more traditional networking means should be retained. A great deal of that depends on where a network provider is, in terms of network scale and initial investment, and what their goals are, in terms of providing services.

For providers looking to provide enterprise-level business-class services, Carrier Ethernet is generally a no-brainer. The involvement of companies like Optimum Lightpath (see our Q&A in this issue), Covad, and XO, is a testament to the extent to which Carrier Ethernet makes sense in the business world.

However, there are organizations whose networks may be too far-flung or too low-bandwidth to warrant Carrier Ethernet rollouts.

In addition, there are concerns about unreliability on Carrier Ethernet networks, with packet loss and packet delay plaguing networks, particularly in the early days of Ethernet WANs. In addition, the provisioning software for Carrier Ethernet is still less sophisticated than those tools available for SONET networks. Furthermore, Ethernet is a connectionless

technology, so network visibility and fault management are still somewhat more difficult in the Carrier Ethernet world than in other network types.

There were also concerns among many that widespread Ethernet-based networking standards like PBB-TE were not being actively adopted by major carriers due to uncertainty about the future growth and development of the technology.

Furthermore, while there have been considerable advances made in standards for Carrier Ethernet, carriers we have talked to are still experiencing significant disappointment over the extent to which they are able to effectively leverage multi-vendor solution options, citing a degree of continued resistance from some hardware manufacturers in standards compliance.

So, in many ways, Carrier Ethernet's biggest fault is its relative still-newness. Even at a low price point, there's little incentive to rip-and-replace in favor of Carrier Ethernet. Burton Group analyst Eric Siegel noted in an issue of Processor Magazine that "global enterprises with a large number of locations and complex MPLS-based WANs should probably stick with what they have for now."

Furthermore, there are any number of CSPs for whom Carrier Ethernet probably doesn't make all that much sense, or isn't on the table. RLECs in West Virginia with a largely residential clientele don't need it. In addition, as NPRG analysts Ed Gubbins and Craig Clausen note in this issue, many SMBs with limited data needs are just as well served through mid-band technologies like Ethernet over copper, and don't need brand new deployments of fiber-based Carrier Ethernet.

So is Carrier Ethernet wrong for your business? That all depends on the business you're in. If low-cost, low-complexity, high-bandwidth deployments between concentrated business centers is your bread and butter, the Carrier Ethernet train is waiting, and you probably have your ticket in your hand as we speak.

If not, advances in the reliability and widespread availability of Carrier Ethernet probably won't make that much of a difference to you.