



1Velocity

ETHERNET COMMUNICATIONS

*Seriously Superior Bandwidth
Business Internet and Metro Ethernet over
wireless fiber in Las Vegas and Reno.*

The Switch to Ethernet

In the past, most businesses used TDM (T1, DS-3, OC-x) instead of Ethernet for WAN and Internet connectivity. Today, businesses are increasingly choosing Ethernet instead. Why?

Ethernet has been used on corporate networks for decades because it is reliable, scalable, and cost-effective. Why have businesses only recently started to use Ethernet for WANs and Internet?

A QUICK HISTORY LESSON

Back in the day, the only network in town was the telephone network. Corporate LANs spoke Ethernet, but the telephone networks did not. Engineers had to figure out how to transmit packetized data (Ethernet) over a circuit-switched telephone network.

The solution? Use a router to encapsulate packets into telecom protocols like TDM.

TDM: Inefficient, Costly, and Inflexible

As you can guess, there are a few problems with using a telephone network to route data.

- **Overhead:** putting IP packets over TDM carries significant overhead. Keeping data packetized throughout the network would be more efficient.
- **Costly and Inflexible:** to provide 10 Mbps over copper, a carrier had to provision an entire 45 Mbps DS3; for a 100 Mbps connection, a fiber 155 Mbps OC-3.
- **Inefficient:** Unlike a phone call, data comes in bursts. On a voice network, unlike an Ethernet LAN, the bandwidth is always dedicated to that line, and the time between packets cannot be used for other packets.

THE SWITCH TO CARRIER ETHERNET

As data traffic overtook voice traffic, carriers found increasingly affordable ways to transmit packetized data on the phone networks.

Finally, new carriers like Yipes, Cogent, and Telseon built end-to-end Ethernet long-haul networks dedicated exclusively to data. Ironically, now that data traffic has far-surpassed voice traffic, many providers send voice traffic over data networks using voice over IP (VoIP). AT&T has even begun lobbying Congress to shut down the old telephone network.

Ethernet: Better Network, Better Costs

Ethernet has become the de facto standard for most corporate networks thanks mainly to its affordability, scalability, and flexibility. Using Ethernet has many advantages:

- **Scalable:** you don't have to pick 1.5, 45, or 155 Mbps. The leading Ethernet carriers allow you to scale in 1 Mbps increments.
- **Flexible:** configure point-to-point, point-to-multipoint, or (with the leading Ethernet carriers) any-to-any Ethernet virtual private LAN service (VPLS) networks. Ethernet can be used for private networks, Internet, business continuity, and SANs.
- **Affordable:** Ethernet is more efficient, so it's more affordable.
- **Resilient:** SONET accomplishes failover in under 50 ms. With Ethernet, failover can happen in as little as 15 ms.
- **Less Equipment:** because packets no longer need to be encapsulated, you can plug right into a firewall or switch.
- **No Training:** you already know how to use Ethernet. If you can setup a LAN, you can setup an Ethernet WAN.

What's the Catch? The Fiber Gap

Historically, Ethernet has required a fiber-optic connection; efforts to put Ethernet over copper lines have been mixed.

Despite all the fiber installed over the last few decades, three out of four U.S. commercial buildings still only have copper cabling and cannot get Ethernet. Most businesses cannot afford the tens of thousands of dollars required for a fiber build.

Carriers such as 1Velocity have been bridging this fiber gap by using millimeter-wave and microwave wireless to build dedicated wireless Ethernet connections to business.

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