

The background of the entire page is a photograph of two people, a woman on the left and a man on the right, leaning over a wooden desk in a modern office. They are both looking at a laptop screen. The woman is wearing a maroon t-shirt, glasses, and a green necklace. The man is wearing a blue and white checkered shirt and glasses. The office has a wooden wall, hanging pendant lights, and other people in the background.

WHITEPAPER

IS ETHERNET THE RIGHT CHOICE FOR YOUR NETWORK?

THE ADVANTAGES OF ETHERNET SERVICES



Business Ethernet—including Ethernet over Copper (EoC) and Ethernet over DSx (EoDSx)—delivers cost-effective, high-performance network access for growing businesses.

It's a common experience in business networks: give users more bandwidth and they'll immediately find applications that need even more. The traffic load on access circuits in local offices is increasing at a faster pace today because more users rely on business networks for more applications and more services to do their work. And as office settings change to accommodate remote workers and multiple locations, the ability to share information becomes even more critical for business success and growth.

Yet simply increasing bandwidth on existing circuits isn't necessarily the best choice for solving this problem. Taking a look at your business' network needs—and all the services available to meet them—can help you identify more cost-effective solutions for higher network performance. Businesses today want highly reliable, cost-effective and easily scalable network solutions to support needs such as:

- > Running application servers and/or accessing cloud services for websites, email, databases, and business applications
- > Transferring large data, image, or video files
- > Using bandwidth-intensive applications
- > Supporting remote workers or virtual private networks (VPNs)
- > Delivering Voice over IP (VoIP) and video conferencing services with end-to-end Quality of Service (QoS) to local offices
- > Delivering content to their end customers, suppliers, and business partners

In the past, the traditional T1 and bonded T1 access circuits have been the gold standard for reliable business network connectivity. Ethernet over Copper is a newer technology service that gives you even more bandwidth for less money and is even easier to interface. Ethernet over

Copper uses the same twisted pair telephone wiring that T1 lines use so most every business location in the country is already wired for service. The main difference is that the equipment on each end uses a more advanced technology to transport higher bandwidth through each copper pair.

EoDSx is the perfect solution for businesses seeking performance, simplicity, and value when the service location is beyond the reach of the bandwidth requirements for EoC. EoDSx offers symmetrical bandwidth with predictable speeds and is easily scalable. EoDSx is an affordable alternative to Fractional DS3 with faster deployment.

Ethernet technology has long been used to efficiently and effectively build LANs within business settings. Its widespread presence in the business world is a testimony for its simplicity and efficiency, as well as its ease of use and management. Now, Ethernet extends into the WANs as a cost-effective solution for connecting business sites to each other and to the Internet. Wide-area Ethernet services are an ideal choice if your business has intensive bandwidth demands and multiple locations in one or more major cities.

Until recently, only a select few service providers offered separate metro Ethernet services (connecting sites within the same city) and long-haul Ethernet services (creating a point-to-point connection between sites in different cities) over expensive fiber networks. Previously the cost and availability of Ethernet technology put it beyond the reach of most businesses. Today's Ethernet services use relatively inexpensive and omnipresent copper lines to deliver the speeds that small and medium businesses and enterprises need.

In this design, the Ethernet service operates in the same way as any other access service, allowing one site to connect to another site on your network, whether across town or across the country or connecting to the Internet. This design also means that sites can be configured into virtual private networks (VPNs) regardless of the access service used at each location.



Where available, Ethernet services offer bandwidth up to 1 Gbps, at a much lower cost than DS3 access or comparable bonded T1 service. Ethernet bandwidth is symmetrical, and delivers the same speed for uploads and downloads on the network connection.

Ethernet services are easy to install and manage because the technology uses your existing copper-loop infrastructure, an Ethernet bridge, a router, and a standard, familiar 10/100 Ethernet interface. With some providers, it's also easy to add voice, security, and collaboration hosting services to your business Ethernet connection. This simplicity and support for multiple security, hosted collaboration, and cloud hosting services means Ethernet is easily scalable to meet the growing demands of your business.

By using loop-bonding technology, Ethernet offers greater reliability and bandwidth efficiency than a bonded T1 connection, which uses link-bonding technology. More flexibility for using existing circuits is also possible with loop bonding, which can combine circuits with any mix of bandwidth. In contrast, link bonding requires the same bandwidth on each circuit, e.g., bonding only a 1.5 Mbps T1 circuit to another 1.5 Mbps T1.

Although both methods are effective, loop-bonding is a newer technology that reduces overhead and deals with loop failure more efficiently. This means that if one loop in a bundle fails, the remaining circuits will continue to function.

Service providers offer Ethernet as a fully managed solution, with round-the-clock, proactive network monitoring and management. The solution is also typically backed by service level agreements (SLAs) that guarantee network uptime and as well as time windows for installation and problem response.



COMPARE T1 TO BUSINESS ETHERNET



T1, bonded T1, and DS3 access circuits will remain viable choices for many network locations and applications. However, where it is available, Business Ethernet is a superior choice for symmetrical business-class bandwidth. See the table below to compare traditional T1 services with Ethernet services.

	T1 & Bonded T1	Business Ethernet	Differences
Symmetry Type	Symmetrical Bandwidth	Symmetrical Bandwidth	
Speeds	T1: 1.5 Mbps Bonded T1: 3, 4.5, 6, 7.5, 10.5, 12 Mbps	2, 3, 5, 8, 10, 20, 25, 30, 35, 40, and 45 Mbps (Higher speeds available at competitive prices.)	Ethernet over Copper offers higher bandwidths at a lower cost.
SLAs	99.99% uptime SLA	99.99% uptime SLA	
Scalability	Requires additional equipment and is more costly.	Customer CPE does not need to be changed to increase bandwidth.	Business Ethernet is easier, faster, and less expensive to scale than a T1 or DS3.
Reliability	Link bonding: older technology with less throughput. An impediment in any one of the lines can impact the whole connection.	Loop bonding: Newer technology with greater throughput. If one loop fails, bandwidth remains available (i.e., it doesn't impact the entire connection).	Loop bonding delivers more efficient bandwidth use and improved reliability.
Availability	Available nationwide in 365 metro areas.	Available nationwide. EoC is distance-dependent from CO. EoDSx provides the same speeds regardless of distance from CO.	EoC has distance limitations. EoDSx and T1 do not.
Quality of Service (QoS)	QoS with VoIP	QoS with VoIP	Similar performance on both.
Speed Fluctuation	Dedicated speed will not fluctuate.	EoDSx speed will not fluctuate. The maximum speed of Ethernet over Copper service depends on distance from CO; once delivered, the speed does not fluctuate.	The maximum speed of the Ethernet over Copper service depends on the distance; once delivered, the speed does not fluctuate.
Access Connectivity	T1 voice and data line is a form of Internet connection.	Builds upon standard Fast Ethernet LAN technology for simplicity and ease of connecting devices.	Ethernet simplifies device connections.
Equipment	All required hardware provided by MegaPath.	Uses your existing infrastructure and requires only one piece of hardware, a less expensive router.	Ethernet typically requires a lower-cost router.

* T1 lines offer 1.5 Mbps per line (circuit). Each additional line bonded to the original line increases the speed by 1.5 Mbps; for example, a double-bonded circuit is 3 Mbps. Bonding is practical up to 10-12 Mbps.

SITE CONSIDERATIONS

Ethernet does have one drawback compared to other access technologies: less availability.

Because of distance limitations for Ethernet over Copper (EoC) technology, providers offer EoC service only from selected central offices, usually around large metropolitan areas. Additionally, your site must be within a specified distance from the provider's central office to receive EoC service. EoDSx provides the same speeds, regardless of distance from the CO; the service is not available in all major markets, but its availability is quickly increasing. In contrast, T1 service is available almost everywhere.

INDUSTRY- SPECIFIC BENEFITS

Ethernet services can deliver particular benefits to businesses in several industries.

Retail and Restaurants. Connect stores, restaurants, distribution centers, and management offices within a city while leveraging additional services—such as managed voice, network security services, and cloud-based services.

Healthcare. Transmit digital images, electronic health records, and billing data between local clinics while meeting the increasing demands of HIPAA compliance.

Real Estate. Give agents the high bandwidth they need for video home tours and voice communications with advanced features—such as Find Me/Follow Me.

Banking/Financial. Combine voice and data services on a single, secure connection for more efficient branch-office communications while supporting compliance demands.

Education. Offer distance learning programs and connect satellite campuses over a single network that also supports WiFi Internet access for students, faculty, and staff.

WHAT TO LOOK FOR IN BUSINESS-CLASS ETHERNET

When evaluating any access service, it's important to look at the technologies and design in the provider's network.

A service provider with its own MPLS-based network can deliver the exceptional performance, redundancy, and flexibility necessary to support business-class Ethernet services and VPNs. Because the traffic routing decisions are made within the network, not at the access point, MPLS technology can load-balance the network and route traffic efficiently, for no single point of failure and a high-quality user experience.

To connect all of your sites into a single network, the provider should offer a choice of access types, including Ethernet, T1, and DSL services. When the provider also offers managed solutions for voice, network security, and cloud-based services, you can meet nearly all of your communications needs in one place.

Equally important is the quality of the provider's network support and monitoring services. Support should be available 24/7/365 to help users and resolve problems. And providers that offer advanced, proactive network monitoring can maximize the availability of your wide-area Ethernet connections.

Use the worksheet on page 8 as a guide for evaluating the Ethernet offerings from service providers.

Ethernet Service Evaluation Factor	Provider #1	Provider #2	Provider #3
Offers Ethernet service for all target locations nationwide			
Supports symmetrical speeds up to 1 Gbps			
Initial and monthly recurring costs for Ethernet service			
Automated installation processes to speed deployments			
Multiple options for access circuits where Ethernet is not available			
Other managed services available: <ul style="list-style-type: none"> • Voice • Network Security • Hosted IT 			
Class of Service (CoS) support at the access circuit level for voice and other bandwidth-intensive applications			
Nationwide MPLS network with Ethernet available in major cities			



MEGAPATH ADVANTAGES

Offering Ethernet speeds up to 1 Gbps in select markets, MegaPath Business Ethernet provides top speeds over a single, reliable connection and comes with a 99.99% SLA-backed uptime guarantee, as well as aggressive installation and latency SLAs. Service bundles that include Ethernet, Hosted Voice, and Proactive Monitoring deliver even greater cost savings for business customers.

NEXT STEPS

Visit www.megapath.com/data/ethernet to learn more, or contact a MegaPath Business Consultant today at 877-611-6342.