

CONNECTIVITY SOLUTIONS: ETHERNET

POWERING CONNECTIVITY WITHOUT COMPROMISE



YOUR LOW LATENCY LINK

When your business expands to multiple locations, you'll be faced with several important network challenges. Will you need to spin up servers at each office, invest in a PBX for each satellite office and how will you manage Internet and voice at each location? Outdated legacy technologies can't keep pace with increasing demands and business growth. If that wasn't enough, your in-house IT staff are already constrained by WAN technologies like MPLS that require extensive carrier contact and coordination in order to make routing adjustments.

In the current technology climate, the answer to multisite connectivity is overwhelmingly Carrier Ethernet. Ethernet solutions from Frontier® provide a flexible, reliable, seamless network that keeps organizations of all sizes moving. Trusted by businesses in 29 states, including 93% of the Fortune 500, Frontier's MEF 2.0 Certified Carrier Ethernet network can help your multisite business stay connected and agile by:

SIMPLIFYING

Ethernet solutions reduce complexity by carrying all your sites' voice and data traffic over one network, eliminating the time and cost of managing separate networks. Ethernet's "plug and play" simplicity means your IT staff can spend more time on core strategy and less time dealing with connectivity issues.

STAYING FLEXIBLE

Whether you're opening new locations, adding new services or simply need more bandwidth, Carrier Ethernet can support the fluctuating demands of large, distributed enterprises. Efficiently use resources by providing the right connectivity to each location, while also being able to easily scale bandwidth up or down.

CUTTING COSTS

Tight budgets hold enterprises back from adopting new technologies, but Carrier Ethernet delivers cost efficiencies compared to traditional solutions such as T1, Frame Relay and ATM. Broad geographical coverage and multiservice access translate to lower equipment and power needs.

DELIVERING VALUE BEYOND THE LAN

Frontier provides additional value by going beyond the LAN to provide managed services that streamline IT operations.

THE BENEFITS OF AN ENTERPRISE DATA SOLUTION LIKE MULTI-SITE ETHERNET ALLOW A COMPANY TO:



REDUCE CAPEX

Frontier Ethernet solutions make way for CAPEX reduction by allowing you to deploy critical infrastructure in strategic locations and then providing connectivity across the footprint via low-latency private connections.



SCALE PAINLESSLY

Scale up to 10G with Frontier Ethernet solutions deployed over optical fiber. Practically no site is out of reach as Frontier leverages the networks of the largest carriers in the USA to get connectivity to your locations that are out of Frontier franchise areas.



COLLABORATE EFFORTLESSLY

Your business agility improves when your employees can collaborate more efficiently. Ethernet makes common UC tools like video conferencing or instant messaging, easy to implement by providing an ideal network foundation for clear audio and sharp video. Enterprises can prioritize video conference traffic to offer seamless “face-to-face” meetings.



STREAMLINE MANAGEMENT

Configurations such as EVPL allow you to mandate access to the Internet or PSTN through a central location known as the hub. This streamlines management as it allows you to manage one firewall, PBX, and Internet circuit at a single location while controlling OPEX, as each satellite only requires one WAN connection.



SHARE AND PROTECT INFORMATION

Transfer data between your locations with the comfort of knowing your data will never touch the Internet. With connection speeds of up to 10 Gbps, Ethernet solutions are uniquely capable of moving large and complex files and ensuring data protection through either segmented networks or virtual private networks (VPNs). Segmented networks restrict branch locations from sharing data with each other or entities outside the network; whereas, VPNs increase your ability to comply with regulatory mandates at the state, federal and industry levels..

FRONTIER'S ETHERNET SOLUTION PORTFOLIO

EPL: Point-to-point

EP-LAN: Multipoint-to-multipoint

EVPL: Point-to-multipoint

EVP-LAN: Multipoint-to-multipoint w/Service Multiplexing

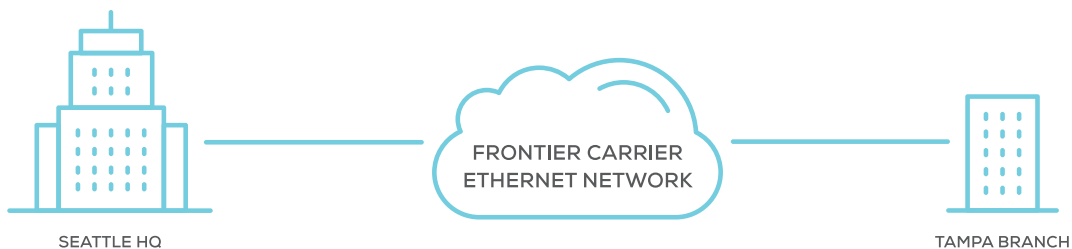
EPL (ETHERNET PRIVATE LINE)

This allows two locations to communicate seamlessly while supporting Layer 2 control protocols like Spanning Tree Protocol (STP).

- Provides point-to-point connectivity between two locations
- Available over Fiber or Copper
- Available in Silver, Gold or Platinum CoS
- Available in bandwidths up to 10 Gbps
- Easily scalable to meet the needs of a growing business
- Perfect for a business that requires a private and low-latency link between locations
- Can be delivered off-net using our Type II partners

Well-suited for:

A mid-sized manufacturing company deploys an EPL to connect its headquarters to its warehouse.

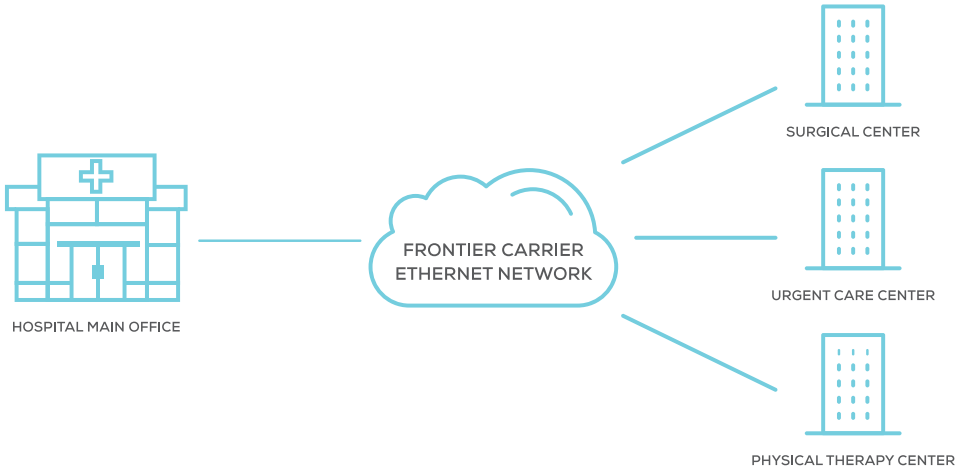


EVPL (ETHERNET VIRTUAL PRIVATE LINE)

This ensures communication only takes place between a hub and spoke, never between two spokes. This type of Ethernet solution is used to connect three or more locations in a hub-and-spoke configuration.

Well-suited for: A hospital network deploys an EVPL to connect each outpatient location to the electronic medical records software at headquarters, but not to each other.

- EVPL is designed for businesses with three or more locations that require satellite locations to communicate directly to a central office
- Available over Fiber or Copper
- Available in Silver, Gold or Platinum CoS
- Available in bandwidths up to 10 Gbps
- Easily scalable to meet the needs of a growing business
- Perfect for a business with centralized assets at HQ that need to be shared with satellites or branch locations
- Can be delivered off-net using our Type II partners



EP-LAN (ETHERNET PRIVATE LOCAL AREA NETWORK)

This connects three or more locations in an any-to-any configuration which provides a fully meshed solution for enterprises migrating from Multiprotocol Label Switching (MPLS VPN) and other technologies.

- Allows any-to-any connectivity over our state-of-the-art Carrier Ethernet Network
- Available over Fiber or Copper with strong Service Level Agreements
- Ideal for a business that needs to distribute shared resources over a large footprint
- Can be delivered off-net using our Type II partners

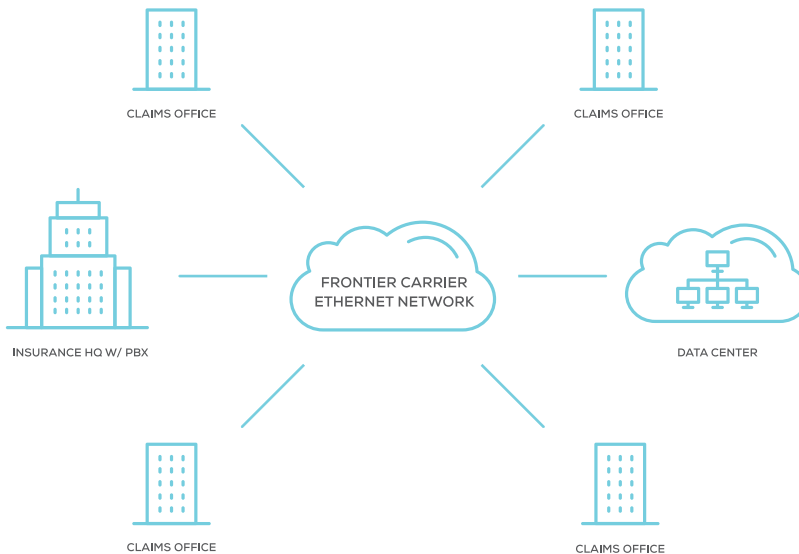
Well-suited for: A large enterprise with distributed resources across its footprint deploys an EP-LAN so each location can access resources on demand.

EVP-LAN (ETHERNET VIRTUAL PRIVATE LOCAL AREA NETWORK)

This connects three or more locations while integrating other services. This topology combines the benefits of a fully meshed solution with the ability to integrate additional data connectivity services like Ethernet Internet Access (EIA) and IP Connect via Service Multiplexing at each User Network Interface (UNI).

Well-suited for: A school district requires two separate wide area networks (WAN) for Voice and data, so an EVPL and EVP-LAN are combined at the headquarters UNI to hand off on a single port.

- An EVP-LAN allows integration of services such as EIA, IP Connect and more
- Available over Fiber or Copper with strong Service Level Agreements
- Ideal for a business that needs to distribute shared resources over a large footprint while also requiring other services to be multiplexed
- Can be delivered off-net using our Type II partners



ETHERNET DATA SERVICES SERVICE LEVEL AGREEMENT

AVAILABILITY AND MEAN TIME TO REPAIR

| CIRCUIT AVAILABILITY | MONTHLY RECURRING CHARGE (MRC) SERVICE CREDIT |
|----------------------|---|
| Below 99.95% | 30% |
| Below 95.0% | 50% |

ETHERNET FRAME LOSS RATIO

| PACKET LOSS QOS LEVEL | CITY | STATE | INTER-STATE | MRC SERVICE CREDIT |
|-----------------------|-------|-------|-------------|--------------------|
| Silver | 0.10% | 0.10% | 0.10% | 10% |
| Gold | 0.01% | 0.01% | 0.03% | 15% |
| Platinum | 0.01% | 0.01% | 0.03% | 20% |

ETHERNET FRAME TRANSFER DELAY

| LATENCY QOS LEVEL | ROUND TRIP DELAY OVER THE | | | MRC SERVICE CREDIT |
|-------------------|---------------------------|----------|-------------|--------------------|
| | CITY | STATE | INTER-STATE | |
| Silver | ≤ 56 ms | ≤ 100 ms | ≤ 250 ms | 10% |
| Gold | ≤ 26 ms | ≤ 60 ms | ≤ 160 ms | 15% |
| Platinum | ≤ 14 ms | ≤ 36 ms | ≤ 140 ms | 20% |

ETHERNET FRAME DELAY VARIANCE

| JITTER QOS LEVEL | AVERAGE JITTER PER SITE OVER THE | | | MRC SERVICE CREDIT |
|------------------|----------------------------------|---------|-------------|--------------------|
| | CITY | STATE | INTER-STATE | |
| Silver | n/s | n/s | n/s | 10% |
| Gold | ≤ 8 ms | ≤ 40 ms | ≤ 40 ms | 15% |
| Platinum | ≤ 3 ms | ≤ 8 ms | ≤ 10 ms | 20% |

FAQS FOR MANAGING YOUR MULTI-SITE BUSINESS

1 Is there more than one way to connect my locations?

Frontier's Ethernet Solutions give you several options for keeping your business connected, including EPL (Point-to-Point), EVPL (Point-to-Multipoint), EP-LAN (Multipoint-to-Multipoint), and EVP-LAN (Multipoint-to-Multipoint). But don't worry; our team of MEF Certified experts can help you decide which is the best configuration for your business.

2 What if each location has different bandwidth needs?

You can give each location exactly the amount of bandwidth it needs. For example, if your company headquarters uses more bandwidth than remote offices, simply tailor your bandwidth requirements to reflect those differences.

3 Is Carrier Ethernet a cost-effective way to connect locations?

Absolutely. Frontier Ethernet Solutions are based on the very same Ethernet in your LAN, which means it benefits from economies of scale as the devices that power it are built by major manufacturers and used by individuals and businesses alike around the world.

4 Is it difficult to share large files between multiple locations?

An Ethernet connection allows you to share large sets of data across locations at consistently fast speeds, even during peak usage times with added security measures in place so you can focus on your core business.

5 What if my business needs to scale?

Not a problem. Frontier Ethernet is a flexible solution that makes it easy to add or remove locations with easy integration into existing infrastructures

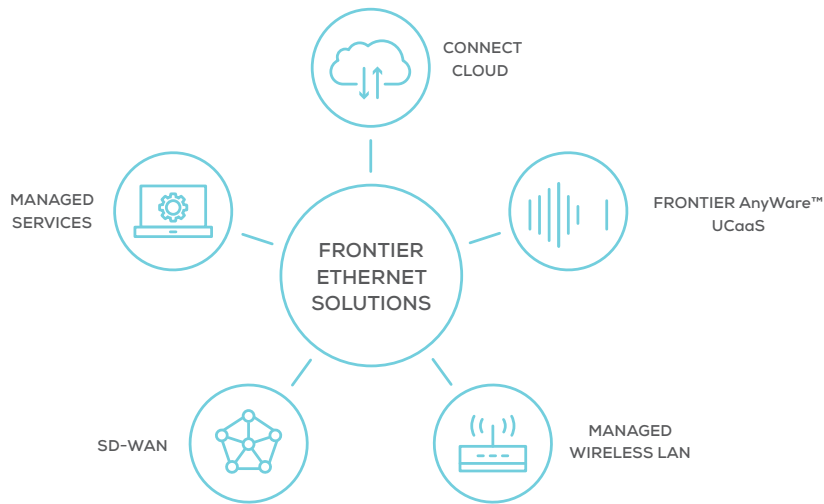
WHY FRONTIER ETHERNET?

At Frontier we take pride in delivering quality service, a reasonable price and the expertise you need in a communications partner. Here are just a few characteristics our Ethernet services deliver:

- High availability and performance
- Symmetrical upload and download speeds enable uncompromised traffic flow
- Metro Ethernet MEF 2.0 Certification
- Well-planned and coordinated migration from other carriers with minimal downtime
- Commercial-grade network with a coast-to-coast data backbone

ABOUT FRONTIER BUSINESS

Frontier's advanced fiber network serves businesses of all sizes, ranging from small and mid-sized businesses to Fortune 500 companies.



MEF 2.0 Certified Carrier Grade Network and Services

Our solutions are certified, and so are our people. Our staff includes many MEF-CECP (Carrier Ethernet Certified Professionals), most of whom are MEF-CECP 2.0 Certified. Our team has demonstrated competencies in designing, deploying and providing lifecycle support for carrier Ethernet networks, services and equipment. These certifications allow us to stay at the forefront of communications and provide next-generation technology.

Sources:

1. Insight traits truly agile businesses. Retrieved on July 1, 2019. www.accenture.com/us-en/insight-traits-truly-agile-businesses.

Contact Us

Speak with your Frontier Business Consultant today.

Find out how our enterprise data solutions can help your multi-site business power connectivity without compromise.

877.766.4603

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