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February 23, 2015

Via ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW, Room TW-5-A325
Washington, DC 20554

Re: Special Access Data Collection, WC Docket No. 05-25; RM-10593

Dear Secretary Dortch,

On behalf of LTS Buyer LLC ("LTS Buyer"), FRN 0022321970, and the Subsidiaries identified in its February 23, 2015 holding company letter, enclosed for filing, in accordance with the Order and Data Collection Protective Order¹, are the non-confidential and the redacted version of LTS Buyer's Highly Confidential responses to essay questions as part of the special access mandatory data collection. The Confidential and Highly Confidential versions of the essay responses and the Highly Confidential data container have been submitted via the Commission's Special Access Web Portal.

In accordance with the Data Collection Protective Order, all pages of this filing are marked "REDACTED - FOR PUBLIC INSPECTION".

Please direct any questions to Fernanda Hilb Manko of Lightower Fiber Networks at (703) 434-8533, or to the undersigned.

Sincerely,

/s/ Tamar E. Finn

Tamar E. Finn
Counsel to LTS Buyer LLC

cc: Fernanda Hilb Manko

¹ In the Matter of Special Access Rates for Price Cap Local Exchange Carriers, WC Docket No. 05-25; AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, RM-10593, Order and Data Collection Protective Order, Appendix A, para.3, DA 14-1424, (rel. Oct. 1, 2014).

LTS Buyer LLC

Question II.A.5

Provide a map showing the fiber routes that you (a) own or (b) lease pursuant to an *IRU* agreement that constitute your network, including the fiber *Connections* to *Locations*. In addition, include the locations of all *Nodes* used to interconnect with third party networks, and the year that each *Node* went live.

ANSWER:

[BEGIN HIGHLY CONFIDENTIAL] [REDACTED] **[END HIGHLY CONFIDENTIAL]**. All information is Highly Confidential.

LTS Buyer LLC

Question II.A.10

Provide data, maps, information, marketing materials, and/or documents identifying those geographic areas where you, or an *Affiliated Company*, advertised or marketed *Dedicated Service* over existing facilities, via leased facilities, or by building out new facilities as of December 31, 2013, or planned to advertise or market such services within twenty-four months of those dates.

ANSWER:

LTS Buyer LLC, through its subsidiary CLECs, offers service throughout the Northeast, Mid-Atlantic, and Chicago Metro geographic areas. The map in the attached marketing materials shows the areas where the company's network is located and where the company advertised or marketed Dedicated Service over existing facilities, via leased facilities, or by building out new facilities as of December 31, 2013, or planned to advertise or market such services within twenty-four months of December 31, 2013.

COLOCATION SERVICES

Power, Space and Connectivity

OVERVIEW

Colocation services have become critical business requirements due to explosive data growth and the need for high-bandwidth, low latency connectivity to key network destinations and data sources.

Companies may consider upgrading their internal data centers as their primary option, but there are a number of challenges to this, including increasing power and cooling densities and cost, network optimization, and full facility redundancy.

Lighttower enables a myriad of customers across multiple industries to limit points of failure by putting mission-critical applications at the network's edge for disaster recovery, business continuity, SaaS, Cloud computing, physical redundancy, and backup.

Lighttower provides customers with secure, state-of-the-art colocation centers throughout the Lighttower footprint. Each colocation center is strategically positioned to facilitate high-bandwidth connectivity to key business locations including carrier hotels, data centers, and content providers.

Our secure facilities are engineered to protect your servers and communications equipment in a clean, secure environment with redundant power and cooling. Our colocation centers are fully secure, temperature controlled, and offer power ready racks, cabinets, and bulk space.



ABOUT LIGHTTOWER

Lighttower Fiber Networks is the premier provider of custom, high-capacity network services that ensure optimal application and business performance. From Wavelengths, Video Transport, and Dark Fiber to Ethernet and Internet Access, the company delivers bandwidth and access where it is needed throughout the Northeast, Mid-Atlantic, and Chicago Metro with connectivity to critical landing points internationally.

Because we own and operate our all-fiber network, Lighttower can build customized and unique solutions to serve the needs of the enterprise, government, data center, and carrier markets.

With 20 years of experience, Lighttower is committed to the highest level of service and support with dedicated customer managers, network operations facilities, and a company culture that believes the customer comes first.

LIGHTTOWER COLOCATION FACILITIES

- 491 PRATT CORNER ROAD, AMHERST, MA
- 60 SCHOOL STREET, BROCKTON, MA
- 41 GLENN STREET, LAWRENCE, MA
- 274 APPLETON STREET, LOWELL, MA
- 34 ST. MARTIN DRIVE, MARLBOROUGH, MA
- 285 WEST STREET, MILFORD, MA
- 353 MASSACHUSETTS AVENUE, NORTH ADAMS, MA
- 142 CANAL STREET, SALEM, MA
- 187 STURBRIDGE ROAD, WEST CHARLTON, MA
- 474 MAIN STREET, WORCESTER, MA
- 1 FEDERAL STREET SPRINGFIELD, MA
- 1 SUMMER STREET, BOSTON, MA
- 360 HAMILTON AVENUE, WHITE PLAINS, NY
- 111 8TH AVENUE, NEW YORK, NY – 8TH FLOOR
- 60 HUDSON STREET, NEW YORK, NY
- 165 HALSEY STREET, NEWARK, NJ
- 235 PROMENADE STREET, PROVIDENCE, RI
- 401 N. BROAD STREET, PHILADELPHIA, PA

COLOCATION FEATURES

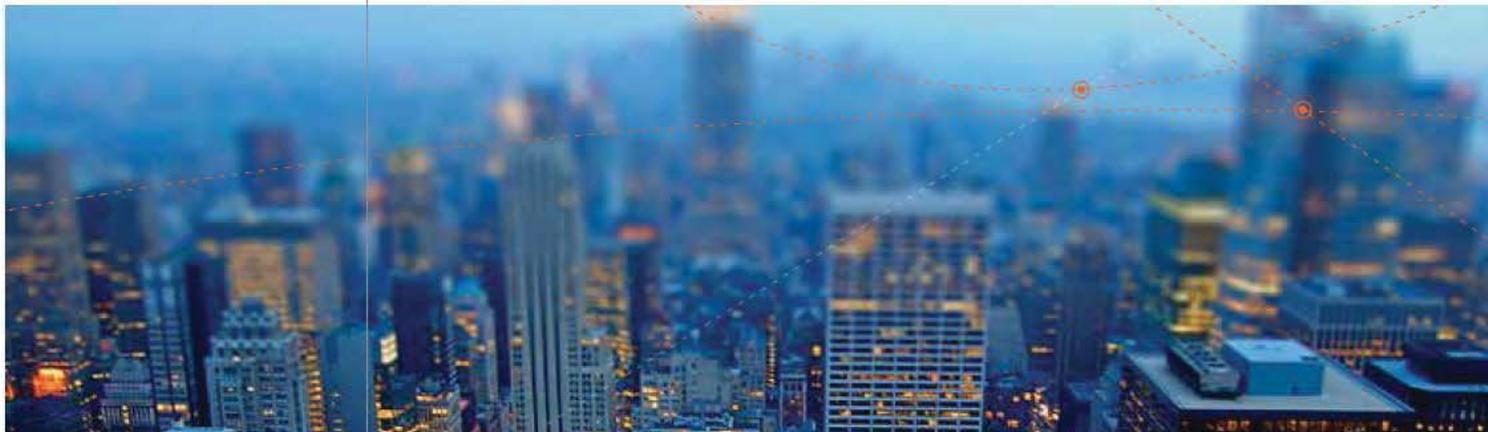
- Flexible Space Options
- Flexible Power Options
- Flexible Connectivity Options
- Backup Power
- Environmentally Controlled
- Secure Access to the Lighttower Network

COLOCATION BENEFITS

- Highly Scalable
- Connect on the Lighttower Network
- Carrier-Grade Reliability
- Strategically located sites

COLOCATION APPLICATIONS

- Data Center Operations
- Carrier Interconnection
- Disaster Recovery/Business Continuity
- Off-Site Business Applications



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THE LIGHTOWER NETWORK

- 8,500+ service locations
- 20,000+ route miles
- 175+ connected data centers
- 40+ connected financial exchanges
- 18 Lightower colocation centers
- 250+ carrier hotels and central offices

The premier, all-fiber provider of custom, high-capacity network services that ensure optimal application and business performance.

HIGH PERFORMANCE, ALL-FIBER NETWORKS FOR ANY APPLICATION

Lightower Fiber Networks is the premier, all-fiber provider of custom, high-capacity network services that ensure optimal application and business performance. Our comprehensive suite of all-fiber solutions serve the needs of enterprise, government, carrier, and data center customers throughout the Northeast, Mid-Atlantic, and Chicago Metro with connectivity to London and Toronto.

Lightower has nearly 20 years of experience in providing highly reliable and scalable, all-fiber networking solutions complete with the highest levels of customer service and support. From back-up and recovery, content carriage, and media distribution to medical imaging, distance learning, and cloud connectivity, Lightower designs networks that support the applications that drive your business goals. What's more, the largest telecom operators in the world trust the Lightower network with voice, video, data, and wireless traffic throughout our footprint.

A UNIQUE AND DIVERSE NETWORK

Lightower's unique and diverse network is connected to financial exchanges, data centers, stadiums, media and content hubs, carrier exchange points, wireless towers, enterprise locations, and more. Today, the company delivers network services to over 8,500 service locations with more than 20,000 route miles that include fiber assets in the Northeast, Mid-Atlantic, and Chicago metro area as well as critical landing stations and exchanges, internationally.

Our rich regional presence and local construction expertise allows us to offer our customers flexible connectivity options, ranging from standards-based services to custom solutions. Lightower also offers customers unique and diverse network routes and multiple access options.

The Lightower Network is continually expanding as we add new routes, new commercial buildings, and new data centers. Our commitment to connect to every major data center within our footprint enables us to be a critical player in content distribution and Cloud services market. Today, the company connects to over 175 data centers and over 250 central offices and telecom hotels.



HEADQUARTERS

80 Central Street
 Boxborough, MA 01719
 978.264.6000

CONTACT US

888.LT.FIBER
 info@lighttower.com

HIGHLY RELIABLE SERVICES

When you select Lighttower for your networking needs, we go the extra mile to ensure the reliability of your services and your complete satisfaction. We own and operate our all-fiber network and pride ourselves on providing the one-to-one experience that our customers want and deserve.

From Dark Fiber and Ethernet Services to Wavelengths, Internet Access, and Video Transport—you can be assured that you will receive leading-edge, reliable services from Lighttower.

CUSTOM SOLUTIONS

Lighttower understands your unique connectivity requirements and custom engineers your applications into our network. No cookie-cutter solutions or over-subscription bottlenecks. Our sales, engineering, and operations teams understand the importance of your applications to the success of your business. From video transport and ultra-low latency networks to custom private optical designs, Lighttower delivers best-in-class services and solutions for your organization. This expertise extends to how we build and grow our network. Our field operations and engineering teams are the best-in-the-business at connecting facilities with efficiency, diversity, and speed.

COMPLETE CUSTOMER SATISFACTION

Lighttower was built from the ground up to deliver networking excellence and satisfy our customers. The company has won numerous awards for our customer service and industry expertise.

Lighttower Fiber Networks is the premier, all-fiber provider of custom, high-capacity network services that ensure optimal application and business performance. The company offers over 20,000 route miles of network, providing access to over 8,500 service locations throughout the Northeast, Mid-Atlantic, and Chicago Metro with connectivity to critical international landing sites. Lighttower Fiber Networks is headquartered in Boxborough, MA.

For more information, visit www.lighttower.com or call 888.LT.FIBER.

DARK FIBER

Control and Flexibility with Unlimited Scale

OVERVIEW

Trust Lighttower and our Dark Fiber when your business applications demand unlimited bandwidth, maximum control, and network security. Lighttower's Dark Fiber service offers a variety of connectivity options from individual strands of fiber to complex multi-site designs, customized for your business.

Lighttower offers Dark Fiber to customers who have high capacity bandwidth needs, and who also have the in-house expertise to control and manage their own network. With more than 20,000 route miles over a core network that includes key metropolitan markets, Lighttower has been building and managing Dark Fiber networks throughout the Northeast, Mid-Atlantic and Chicago for over 20 years.

BENEFITS

Reliability, Scalability, Flexibility

Lighttower's unique fiber assets, routes and secure rights-of-way provide the network infrastructure that your business needs, where you need it, to support mission-critical applications.

- Allows customers with in-house optical expertise to manage their own network
- Enables customers to select the equipment best suited to support their applications
- Flexibility to support a large number of configurations, services, and applications
- Delivers virtually unlimited bandwidth at a fixed cost with the potential of capitalizing your network as an asset
- Dark Fiber networks are under your control, completely secure, and are tailored to your connectivity requirements
- Lighttower's fiber network leverages unique rights-of-way providing added resilience to your infrastructure
- Ability to leverage Lighttower's networking expertise and benefit from its award winning customer service
- Strong ROI for companies that use substantial bandwidth and utilize numerous services



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With 20 years of experience, Lighttower is committed to the highest level of service and support with dedicated customer managers, network operations facilities, and a company culture that believes the customer comes first.

SPECIAL CONSTRUCTION PROJECTS

Within Metro areas, Lighttower will support special construction projects linking your critical locations to Lighttower's high performance network. These special assemblies are custom designed, built and implemented to meet your specific networking requirements

FEATURES

Unique Dark Fiber Assets

With Lighttower Dark Fiber, our customers enjoy a unique and diverse resource upon which to build a robust and scalable network, including:

- With an extensive low latency network and massive amounts of fiber, Lighttower's New York/New Jersey metro network footprint is the perfect location for media and entertainment, large financials, service providers, and content providers to deploy Dark Fiber for their business. Lighttower's NY/NJ network includes access to over 40+ financial exchanges and 16 diverse river crossings.
- Lighttower's dense metro Boston network provides Dark Fiber from downtown, south to Providence, west to Worcester, and north to New Hampshire, and everywhere in between.
- Lighttower's Virginia Extension provides service providers and enterprises with a vast Dark Fiber resource covering 11,000 miles and every major metropolitan area throughout Virginia.
- Lighttower's Transcom Route is entirely diverse from the east coast I-95 communications corridor, bypassing Washington, DC completely. This diverse path can be used for back-up and recovery, cloud services, content delivery and more.
- In the Chicago metro area, Lighttower connects Chicago, IL, Elk Grove, IL (major data center park) and Aurora, IL (financial exchange) together to serve the connectivity needs of large enterprises, financial services firms, and content providers.

CONTRACT OPTIONS

Designing Networks that Work for You

Lighttower will work to ensure that the term of the Dark Fiber agreement is right for your business. Lighttower offers several contracting options including lease terms of 5 and 10 years. Other flexible contracting options also are available. Lighttower Dark Fiber is available on most segments of the Lighttower Network.



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For years Ethernet Wide Area Networks (WAN) operated on the same principals of Ethernet Local Area Networks (LAN). Users and the applications they were running or accessing all had the same priority in terms of network resources. This led to situations where network bandwidth had to be increased to ensure that applications like Email did not impact the more sensitive Voice over IP. The best way to solve this issue is to assign priorities to the traffic associated with each application. By assigning higher network priority to the most sensitive and/or the most critical applications, and lower priorities to less sensitive applications, traffic can be managed more efficiently.

LIGHTOWER ETHERNET SERVICES

Lighttower offers a full range of Ethernet services ranging in speed from 10M to 10G. This document is focused on Lighttower's switched Ethernet services portfolio.

BENEFITS OF CLASS OF SERVICE

Customers can realize a number of benefits by utilizing CoS. As an example, CoS allows voice and video traffic to take precedence during periods of peak network utilization. Less sensitive applications such as Email and Web browsing take lower priority but are not impacted in terms of performance or user experience. This is especially true in times of network congestion.

Customers may reduce network costs by using existing WAN resources more efficiently. By assigning each application the appropriate priority, network capacity is used more effectively. The need for capacity expansions or upgrades may be delayed or reduced.

Network administrators gain control over WAN resources allowing them to manage the network from a business, rather than a technical, perspective. Determining key application requirements and assigning appropriate CoS tunes performance beyond adding network capacity to avoid potential issues. Maintaining network performance by the over provisioning of capacity is not an economical solution.

LIGHTTOWER CLASS OF SERVICE

Lighttower offers 4 Classes of Service (CoS) on switched Ethernet services. Lighttower E-Line, E-LAN and EVPL all support multiple classes. The performance attributes of each class are designed to provide customers with prioritization options necessary to manage traffic and ensure application performance. Treating all traffic with the lowest priority can cause application performance issues. Conversely, treating all traffic with the highest priority can be uneconomical. Some applications, such as VoIP must be transported with the highest priority. Other applications, such as Email, are less sensitive and do not require real-time delivery. Those applications can be assigned a lower network priority and still perform as designed.

By implementing CoS on their CPE, matching application need with the appropriate CoS level, customers can optimize both performance and budgets. Lighttower will not manipulate the Customer CoS priority markings, and will route packets, subject to the selected CoS profile.

LIGHTTOWER CLASSES OF SERVICE OPTIONS:

Lighttower offers 4 Classes of Service (CoS) on switched Ethernet services designed to provide Customers with the ability to match network performance to application need.

- **Lighttower Mission Critical Class of Service** – Designed to provide service closely aligned to dedicated private line. Mission Critical is for applications that require speed and consistency. Packets marked as Mission Critical will be routed across the Lighttower network with the highest priority.

Application examples include Voice Services, Telepresence and Financial Trading.

- **Lighttower Business Critical Class of Service** – A high performing service class designed for sensitive business applications. Business Critical CoS is designed for applications that have direct impacts on productivity and performance if not available on a consistent basis. Lighttower Business Critical CoS is best for applications that require timely responsiveness.

Application examples include SaaS, CRM transactions, Datacenter connectivity, Business Continuity, Simulations, Development and testing.

- **Lighttower Business Priority Class of Service** – A Service Class that offers performance that meets the needs of the majority of general business traffic. Designed for applications that require reliability but are less time sensitive. Business Priority is best for services supporting background systems and services to ongoing operations.

Application examples include FTP and archiving/data warehousing.

- **Lighttower Standard Class of Service** – A Class that offers best effort performance that meets the needs of the lower priority business traffic.

Application examples include general Internet access/web browsing and Email.

Examples of application matched CoS based on performance:

APPLICATION	MISSION CRITICAL	BUSINESS CRITICAL	BUSINESS PRIORITY	STANDARD
Circuit Emulation	x			
Financial Trading	x			
Mobile Backhaul	x	x	x	x
Telepresence	x			
VoIP	x			
CCTV		x		
IPTV Data		x		
Video Conferencing Data		x		
VoIP & Video Conferencing signaling		x		
Database Hot Standby			x	
Database WAN Replication			x	
SANS Replication			x	
Database Client/Server				x
Email				x
Network Attached Storage				x
Web Browsing				x

MARKING OF TRAFFIC

Customers are responsible for determining the bandwidth level for each class of service. For customers who tag their traffic, Lightower supports traffic classification based on the 802.1P PCP bits in the C-tag header. Customers must mark their traffic to conform to the selected classes. Customers must set their 802.1p bits within their network equipment to match the markings required by Lightower.

Lightower's Class of Service markings are:

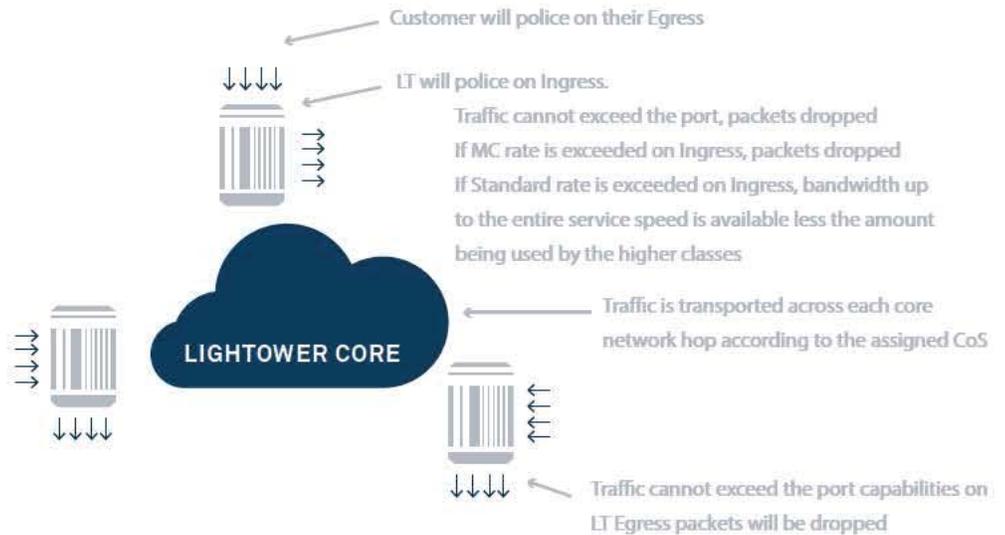
PRIORITY	TRAFFIC TYPE	LIGHTOWER CoS	PCP (802.1P)
High	Highest Priority Applications	Mission Critical	4
Medium/High	Critical Applications	Business Critical	3
Medium	Excellent Effort	Business Priority	2
Low	Best Effort	Standard Ethernet	1

Untagged traffic will default to Standard Ethernet Class and be scheduled and routed accordingly.

Examples of application matched CoS based on performance:

POLICING

Lighttower will police the level of each CoS at the network ingress. Packets exceeding the Committed Information Rate (CIR) for any CoS, other than Standard Ethernet, will be dropped at ingress. It is therefore important to accurately determine the CIR for each premium CoS. Lighttower recommends customers police and/or shape their traffic to the subscribed elevated service levels. Packets cannot exceed the port or CIR for each elevated service.



CONCLUSION

Implementing Class of Service may help improve the performance of critical/sensitive applications. By implementing Class of Service, customers may avoid capacity upgrades to ensure performance. Matching application requirements with network capabilities allows customers to balance performance and cost.

ETHERNET

LAN Extension and Private Line Services for Any Application

OVERVIEW

From health care providers trying to improve patient care by connecting imaging facilities to hospitals, to banks that need to cost-effectively connect branch offices with regional HQs, Ethernet Services have become the go-to data service for high-performance, reliable, and cost-efficient connectivity.

Lighttower's Ethernet services combine the reliability and ubiquity of Carrier Ethernet with next-generation metro area transport technology. The result is services that deliver an efficient, fully restorable, easily managed network that's ready for any vertical or application requirement. Additionally, the natural flexibility of Carrier Ethernet allows you to decide the amount of bandwidth you need to support your applications within your budget now with the assurance that it can scale in the future.

Lighttower's business Ethernet solutions include MetroE Advanced Private Line, E-Line, Ethernet Virtual Private Line (EVPL), and Ethernet Private LAN (E-LAN). With support for Layer 2 point-to-point, point-to-multipoint, and multipoint-to-multipoint topologies, Lighttower enables you to seamlessly extend your Ethernet network from your building into the metro area and beyond.

Lighttower's private, diverse fiber backbone, along with protected access options, provides a robust solution set for your business continuity requirements. Our extensive Ethernet service footprint offers a total solution for businesses with a presence in multiple cities.

Lighttower's skilled Network Operations Center (NOC) technicians proactively monitor the network 24x7 to ensure reliability and responsiveness.



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TECHNICAL SPECIFICATIONS

SPECIFICATION	METRO-E ADVANCED PRIVATE LINE	EPL	EVPL, E-LAN
Technology	Layer 2 Ethernet over private fiber	Layer 2 Ethernet over DWDM or fiber	Layer 2 Ethernet over MPLS or fiber
Throughput	1 Gbps – 10 Gbps	100 Mbps – 100 Gbps	10 Mbps – 10 Gbps
Interface	10 GigE	GigE, 10 GigE, 100 GigE	GigE or 10 GigE
Framing	Jumbo Frames up to 9100	Jumbo Frames up to 9100	Jumbo Frames up to 9100
Network Management	24x7 monitoring and surveillance	24x7 monitoring and surveillance	24x7 monitoring and surveillance
Network Options	Metro configurations	Long-haul and metro configurations	Long-haul and metro configurations
Availability	Available at most on-net locations throughout the Lightower network	Available at most on-net locations throughout the Lightower network	Available at most on-net locations throughout the Lightower network
Architecture	Point-to-point	Point-to-point	Point-to-point, point-to-multipoint, multipoint-to-multipoint, rooted multipoint

BENEFITS

WAN Connectivity from 10 Mbps to 100 Gbps Ethernet

Lightower's business Ethernet solutions enable the extension of LAN infrastructure for WAN connectivity, providing dedicated or virtual private line services. Our Ethernet solution provides committed information rates from 10 Mbps to 100 Gbps, with guaranteed network performance.

A wide range of dedicated and switched bandwidth options—designed to meet your needs—offer flexibility in service delivery:

- E-Line: Dedicated UNIs for point-to-point connections, simple and secure
- EVPL: A flexible, virtualized option allowing multiple applications and connections to run over a converged interface
- E-LAN: Transparent LAN service and multipoint VPNs

Four Classes of Service are designed to provide the routing options necessary to manage traffic while ensuring application performance:

- **Mission Critical:** Ultra high availability, superior performance, lowest latency (requires redundant access connection)
- **Business Critical:** High availability, high performance
- **Business Priority:** Enhanced performance
- **Standard:** Standard performance

Lightower's Ethernet service includes:

- Seamless interconnection with no additional equipment on your premises, reducing equipment capital costs
- No protocol conversion is required, ensuring interoperability between LAN and MAN, simplifying installation & turn-up
- Ethernet is more cost effective on both a cost per bit and cost per port basis versus fixed TDM technologies
- Easier installation and management allows for rapid provisioning compared to other platforms
- Flexible bandwidth allows you to pay as you grow
- Scalable for long term network evolution connectivity

FEATURES

- Highly scalable and variable transport speeds from 10 Mbps to 100 Gbps configurations
- Available in switched and dedicated bandwidth configurations
- E-Line: Point-to-point private line service
- EVPL: Point-to-multipoint WAN service
- E-LAN: Multipoint-to-multipoint service
- Dedicated access links with multiple protection options
- Resilient, high availability core transport services for high reliability
- Standards-based IEEE Ethernet service for Layer 2 transport
- 802.1Q VLAN and 802.1 QinQ tunneling supported
- MEF 9 and MEF 14 certified technology
- 24x7 network monitoring

*Not all features are available in all markets. Please contact us for more information.

THE WINNING COMBINATION FOR FINANCIAL SERVICES

Key elements required for a highly effective network.

Most IT professionals in the financial services industry understand that speed equals profit. After years of focusing on speed and low latency as the most critical aspects of their network, they are recognizing that low latency alone may not provide enough of a competitive edge if the other basic elements to a successful network design are not in place. Low latency, when combined with scalability, security, proximity and resiliency provides financial institutions a winning combination that is able to address their unique business needs.

Just ten years ago, financial trading firms relied on the quickest and most agile traders to transact trades. It is well known that the fastest response to market reactions results in higher margin trades. Today, the best traders are quick, sharp minded and agile. However, their skill sets are now supplemented by technology tools that compute algorithmic trades based on market data, proximity and the ability to leverage low-latency networks.

This paper illustrates that an effective and successful financial services network in addition to low latency must consider other key factors in its design.

Why Low Latency is Still Critical

In 1998, the U.S. Securities and Exchange Commission (SEC) authorized the use of electronic exchanges. Since then, terms like high frequency trading and algorithmic trading have crept into our vocabulary and affected every aspect of the world's financial markets. Before 1998, trading was conducted in minutes.

By 1999, it was in seconds, and today we discuss trade frequency in terms of milli- or microseconds. According to an Aite Group survey, high-frequency trading firms represent 2% of the approximately 20,000 firms operating in the U.S. today, and account for 73% of all equity trading volume. With greater adoption of algorithmic trading, equity and commodity traders, hedge fund operators as well as market data providers, all seek ways to enhance their speed to market, particularly to complete transactions that make or break companies in a highly competitive environment.

According to Information Week, a millisecond advantage in trading applications can be worth more than \$100 million a year to a major brokerage firm. For IT professionals, this means that there is no longer any question that the latency of a network can have a major impact on a financial institution's bottom line.

The lowest latency networks will offer any-to-any connectivity across the network, with direct connections between key locations that do not carry traffic back to a central routing hub. The network should have the capability of transporting multiple gigabit channels and utilize cutting-edge technology that dramatically reduces per-node latency and be able to adapt quickly to changes in order to meet market demand. The network needs to be built with technology that enables software provisioning of bandwidth swiftly and deliver services in hours or days, not weeks or months. Nearly every network provider targeting the financial services industry uses the term "low latency," however, networks are not created equally and there is more to building a high performance network than speed alone. Low latency becomes a true advantage only when it is part of a broader combination of features that work together to optimize the network.



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The Winning Combination

In order for a network solution to provide the best possible advantage to traders in the financial services industry, it needs to have the lowest latency possible plus proximity, scalability, security, and resiliency. The combination of all of these features ensures an optimized network that can meet the day-to-day needs of this segment.

Proximity: Proximity refers to physical space that is made available to market participants for the purpose of locating their network and computing hardware closer to the financial exchange's matching engines in order to gain a latency advantage and to maximize flexibility. Proximity is important to IT professionals, as they need to be as close to the financial exchanges and market data information sources as possible. The shorter the network routes are, the lower the latency will be and the better the trader's network will perform.

In an effort to support this segment and deliver the capabilities required, colocation facilities and data centers are being designed to provide equal or greater computing power in less space. Blade servers and high-density rack configurations allow for more servers to be fit into a given location. High-density colocation design focuses on zones, not physical space.

Cooling is done in hot aisle containment zones that support a denser configuration of equipment per cabinet. For the financial services industry, even inches can introduce latency. An experienced network provider will have demonstrated expertise with, and access to, colocation facilities and data centers and will be able to help you find the solution that fits your needs.

However, a colocation provider that offers a high-density solution in close proximity to a matching engine or exchange isn't the only key advantage. Combine an overall low latency network strategy with proximity together with other key elements such as scalability and security and you have a solution to efficiently and effectively conduct trades.

Scalability: The last ten years have seen an increase in decentralized trading. Whether via dark pools, electronic computer networks (ECNs), or other alternative trading systems, financial services institutions need to be able to quickly access reliable connectivity to new locations. Superior network flexibility is required to meet this decentralization.

Scalability becomes a challenge, as many current networks were not architected to efficiently scale as automated trading volumes grow. With trade volumes experiencing double digit growth year over year, a service provider's provisioning intervals can help or hinder an exchange's time to market. A network's capability to quickly scale a network—in minutes rather than days—can provide tremendous value to any financial trading organization.

The right network solution should be able to adjust to changing needs. Many recommend that IT professionals estimate what their needs will be 5-10 years from now and then search for a network provider who is able to scale to meet those projections. But as changes in technology, network and the way financial service companies do business change, this strategy isn't always possible – the crystal ball is blurry. Instead, assess the growing needs of your company and select a provider that can design a solution that can grow with your needs not just year over year, but month over month. Short-term as well as long-term scalability is important to the success of a financial services company. With market volatility becoming the norm rather than an anomaly, companies need to be able to quickly and efficiently react to changing market conditions.

Security: We have established the need for low latency, proximity and scalability, now we explore network security elements to ensure the integrity of the data, transactions and information. On February 7, 2011, SC Magazine reported that hackers had broken into Nasdaq OMX, a New York-based public company that owns and operates Nasdaq, as well as seven European stock exchanges. Thanks to smart foresight, Nasdaq's trading platform architecture operates independently from the company's web-facing services, thus it was not breached.

What are the factors to consider when ensuring security in your network? As the Nasdaq example illustrates, separation of corporate data and trading data is one strategy to help secure your intellectual property. By keeping information on separate networks, servers and even data centers and colocation facilities, a financial services firm will be able to protect their assets from unwanted visitors, attacks or even outages. Furthermore, compliancy concerns require companies to have at least two diverse connections into their trading environment. This protects against network outages but also ensures a re-routing mechanism should a security breach occur.

The security of a network is always a challenge and that challenge increases with the decentralization of the trading exchanges and the addition of web-based applications. There are a variety of ways to address network security, from diverse network routes to datacenter security and advanced business continuity planning. A quality network services partner can address all of an organization's security needs in a way that does not impede transaction speeds.

While the greater security measures could impact the latency of a network, combined with proximity and scalability, network security is a highly important element to include in the 'winning combination' network equation.

Resiliency: If milliseconds can cost an institution millions of dollars, then any network down time must not be tolerated. The ResiliNets Research Initiative defines computer network resilience as the ability to provide and maintain an acceptable level of service in the face of faults and challenges to normal operation. Network resiliency requires both technical expertise and strong relationship building. An expert network provider will be able to provide a variety of solutions to ensure business continuity, including, but not limited to, multiple network routes, geographically diverse, unique routes, robust service level agreements (SLAs), multiple network operations centers (NOCs), and 24/7 dedicated service and support. Perhaps even more importantly, the best network provider will also work to form a trusted relationship with its clients— answering questions clearly and customizing solutions to meet an institution's unique challenges.

The Xtreme Advantage

The winning network combination is comprised of a number of key elements including latency, proximity, scalability, security and resiliency. Each feature on its own plays an important role in any successful network design, but it's the combination of all five, with an emphasis on time to market, that will provide a financial trading company with an effective platform on which to conduct trades.

IN SUMMARY

Lighttower's Xtreme Ultra-low Latency Network represents the industry's first large-scale, low latency network designed exclusively for the financial services industry. It was carefully designed and purpose built to meet the needs of this segment and integrates the key elements most important to traders. It is a high capacity, high availability network that delivers extremely low latency transport, supported by unique performance level SLAs. The Xtreme Ultra-low Latency Network features a state-of-the-art ROADM/DWDM-based core infrastructure, that assures the integrity of the data packets that traverse the network, and offers the capacity required to ensure the transport of high trade volume.

Additionally, unlike other commercial networks, Xtreme has the ability to keep traffic within New Jersey or extend into New York and out to Chicago, based on a customer's specific requirements for exchange connectivity. Finally, with a smart, software powered provisioning platform, Lighttower can make bandwidth changes swiftly ensuring time to market is expedited for your services. Today, the majority of trades on Wall Street rely on Lighttower's Xtreme Ultra-low Latency Network.

While latency is a key component to network performance, it is clearly not the only factor to consider. With a comprehensive and holistic approach to financial network design and implementation, companies can be truly effective and achieve greater results. A true winning combination includes five key network features: latency, proximity, scalability, security and resiliency.

INTERCONNECTION THROUGH THE ENNI: BRINGING CARRIER ETHERNET GLOBAL

The Power of Carrier Ethernet

Ethernet technology continues to expand its capabilities and market share within the communications industry. Already the technology of choice for enterprise networks, the rise of Ethernet is directly tied to the technology's flexibility, scalability and low cost per bit. In addition, industry standards are streamlining deployment and interoperability, further encouraging adoption rates.

Carrier Ethernet is a term used to define scalable, robust, high-bandwidth Ethernet technology for business communications. Carrier Ethernet is also highly standardized, making it a ubiquitous choice in both large service provider and enterprise networks as it is easily configured and can accommodate a wide range of networks.

Carrier Ethernet offers all of the benefits of Ethernet technology—low cost and widely accepted protocols—as well as various key attributes that distinguish it from the more common office LAN applications:

Scalability: Providing carriers the ability to flexibly manage traffic streams

Reliability: Providing the resiliency and fault tolerance expected in communications networks

Service Level Agreements (SLAs): Providing guaranteed service delivery assurance to customers, made possible by Quality of Service

These attributes, along with Service Management and Standardization (E-line and E-LAN), allow service providers to offer Ethernet services with the familiarity of a well-used protocol and the service characteristics expected from network providers. For these reasons, when it comes to mission critical business applications, Carrier Ethernet will continue to be the technology of choice among service providers.

Interconnection Challenges

No service provider's network coverage is ubiquitous. In order to satisfy their customers' needs, providers will at times connect their networks with other carrier's networks to provide the complete solution.

Traditionally, the process of connecting service providers to each other was extremely time consuming and complex. Varying SLAs, Class of Service (CoS) requirements and management practices made interconnecting communications services across multiple-operator networks a significant challenge for all involved.

Once the interconnection is completed, there are often additional unforeseen operational and engineering costs to manage and maintain the connection. Additionally, more fragmented management and lack of visibility negatively impact the customer experience.



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With this lack of end-to-end visibility, troubleshooting and trouble isolation can be problematic, leading to costly downtime and resolving the issues requires expending significant technical resources. Network issues that are typically addressed quickly when it is within a single provider's network become timely and cumbersome to resolve in a multi-provider environment because it is difficult to isolate the trouble and identify who owns the responsibility for resolving the issue.

Multiple teams need to be involved, which also adds to the complexity and inefficiency. The question for operators who are looking to expand their network is, "Should we build out the network, or should we lease infrastructure?" The answer ultimately comes down to a cost/benefit analysis. Until recently, the option of transparently interconnecting Ethernet Services was not a viable option because of the time and costs associated with provisioning and planning. Months and sometimes more than a year can be spent just in provisioning and planning.

Interconnect Innovation through Standardization

Through standardization of Carrier Ethernet Services, the Metro Ethernet Forum (MEF) has made significant strides in alleviating the obstacles associated with network interconnection. In January 2011, the MEF ratified the key MEF 26 specification, defining Phase 1 of the External Network to Network Interface (ENNI). MEF 26 defines a standardized interface between service providers' Carrier Ethernet networks, significantly accelerating the process of matching different providers' networks and providing end-to-end visibility and management of customer circuits that pass through multiple network providers.

The Interconnection Opportunity

ENNI will have a major impact on the telecommunications industry because of its ability to enable true end-to-end service across multiple operators and aligning capabilities such as CoS, SLAs and management methods. ENNI will present new opportunities for service providers and vendors, and generate even wider opportunities for effective network virtualization.

ENNI creates a variety of opportunities for Carriers, wholesale service providers and enterprise customers. Carriers, particularly regional or metro providers, can increase their footprint to reach new markets and expand their current presence. Additionally, they can offer expanded services to existing customers, being able to more easily extend their footprint by leveraging other provider's networks.

Wholesale service providers have the opportunity to upgrade basic Ethernet connectivity services to full featured Carrier Ethernet networks by interconnecting with multiple service providers. With the surge in smart phone traffic, mobile backhaul network provisioning has become a significant challenge. With ENNI, local providers are now able to interconnect their networks to provide a viable solution for this growing market.

ENNI also has the potential to facilitate deployment in the emerging Carrier Ethernet Exchange market. Ethernet Exchanges offer a multi-lateral complement to the bilateral one-to-one connections between service providers. Instead of having to establish and maintain their own network and service connections, service providers benefit from the scalability and flexibility of a managed exchange without the escalating cost and complexity of managing multiple links to multiple provider partners. This can be a particular advantage when a service provider may want to connect to a diverse group of carriers to offer its services across multiple markets.

Enterprise customers that own and manage their networks also benefit from ENNI by being able to expand and interconnect their regional networks more cost effectively than building or leasing fiber. With end-to-end visibility into the entire multi-network span, businesses can increase efficiencies and decrease management costs. Businesses can also reduce capital costs through logical connections instead of capital-intensive physical assets.

For Enterprise and Carriers, the ultimate value of ENNI lies in the speed and financial benefits it fosters. With ENNI, time to market is significantly reduced, decreasing the effort and cost of provisioning and planning a proprietary infrastructure. Additionally, business efficiencies are increased, with dramatically lower management costs and streamlined interoperability processes for ordering, implementation and billing.

The Future of Interconnection

While the immediate results of ENNI are increased efficiencies and seamless provisioning, the long-term results of global connectivity will have tremendous impact in the global Carrier Ethernet market. Carriers and large enterprises will have the ability to expand their private networks globally, including areas that are currently cost prohibitive. The benefits of reliable, managed high-speed connectivity will be available to all geographies not just within the metro.

ENNI will evolve from connecting one network provider to another, to forming a network of providers who all support the same quality services. Additionally, network providers will face diminishing risks of competitors expanding into their footprint with competing services, as ENNI will be the most rapid and cost-effective option for expanding network reach.

As with any new service offering, Enterprises and Carriers may be hesitant to adopt this new service until it has been proven in the market. As regional and metro players begin to expand into the global networking marketplace, new challenges will also be presented in how to operate their business, creating the need for new business models to more effectively operate in a global arena.

Despite these potential risks, ENNI is certain to be the option of choice for network expansion. It is crucial that ENNI partners offer entry to key access points and diverse routes to high traffic areas. It is equally important that carriers are familiar with the standards and supporting technologies to fully support rapid and efficient deployment of ENNI services. While compliance with the MEF standards is a sufficient start, carriers should also look to a partner that offers flexibility, expertise and state-of-the-art technology and capabilities to ensure the best possible outcomes.

LIGHTOWER FIBER NETWORKS: INTERNET ACCESS SERVICES BURST TRAFFIC REFERENCE GUIDE



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Customers who purchase Internet Access or Dedicated Internet Access (DIA) (Internet Access and DIA heretofore known as "Internet Access Service") from Lightower, are invoiced a Monthly Recurring Charge (MRC) for a Committed Information Rate (CIR) to the Internet. Customers can send and receive Internet traffic up to the CIR for the MRC set forth in the Service Order Form (SOF). Customers have the option to select Burstable Bandwidth on their SOF with a limitation to the amount of burst which is allowed or with the ability to burst to port speed of the service (certain restrictions apply). On occasion, customer traffic levels may exceed the CIR; such Internet Traffic beyond the CIR is designated as "burst traffic" and will be billed in accordance with 95th percentile methodology (further explained below).

BURSTABLE BANDWIDTH ON INTERNET ACCESS SERVICES

Customers who select bandwidth on the Service Order Form (SOF) will be able to burst beyond their CIR. Burstable Bandwidth gives customers the ability to burst beyond the CIR to a pre-defined bandwidth limit which may range up to the full available port rate. Lightower will route burst traffic on a best effort basis. Unlike CIR, Best Effort traffic has no delivery guarantees.

BILLING

The customer is billed monthly based on one line item for the CIR service and a second line item for any applicable bursting charges. If the customer does not utilize bursting during the month, the Bursting charge is \$0.00. Otherwise, the bursting charge will be computed as described below. Billing for the CIR is performed one month in advance; billing for Burst traffic occurs one month after the actual usage.

PRICE STRUCTURE

- **Term** – Burstable Bandwidth is a dynamic monthly charge based upon usage. The Term associated with the CIR associated with the circuit will dictate the Term associated with any burstable bandwidth option.
- **Pricing Structure** – Burstable Bandwidth is priced as a percentage of the current or quoted price per-megabit charge for the CIR associated with the circuit.

For example: A quoted Internet Access Service carries a Committed Information Rate (CIR) of 2 Mbps and a rate limit of 5 Mbps on a 100 Mbps Port. The proposed MRC for the Internet Access Service is \$20, yielding a rate of \$10 (\$20 divided by 2 Mbps) per megabit per month. The Burst MRC per megabit would be calculated (in this example) as 110% x \$10, or \$11 per Mbps, per month. The maximum Bursting MRC would be 3 (5 Mbps rate limit minus 2 Mbps CIR) Mbps x \$11, or \$33.00, yielding a total monthly MRC charge of \$53.00.

- Determining the Level of Burst Traffic – To determine actual traffic, samples are taken from the customer's inbound and outbound Internet traffic rates for each 5-minute interval throughout the month. To determine the 95th percentile of actual usage, the higher of inbound or outbound traffic rates for each 5-minute period will be sorted in descending order. The top 5% of these periods are removed and the value left at the top (at the 95% position) is the actual usage for the month. This 95th percentile actual usage traffic rate will be used as the basis for the monthly bill.

For each Port associated with an Internet Access Service ordered, Customer shall be billed the higher of:

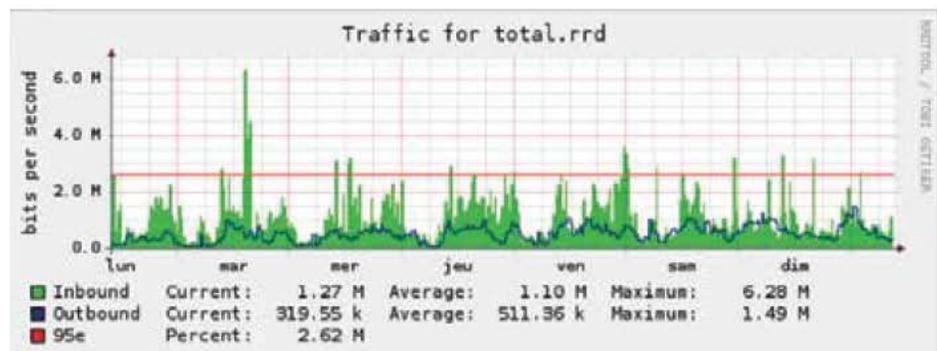
Billing Scenario 1 - The CIR MRC (in the event Customer's 95th percentile usage is equal to or less than the applicable CIR)

Billing Scenario 2 - If the 95th percentile usage does exceed the CIR, a total MRC equal to the CIR MRC plus a busting charge for the month which is computed as the difference between the 95th percentile actual usage and the CIR, in Mbps, multiplied by the applicable Burst MRC per megabit.

Lighttower does not support "Aggregate Billing," the combination of CIR across multiple Ports, at this time.

- Pricing Example – As discussed above, a customer with a 2 Mbps Internet CIR is billed a CIR MRC of \$20, or \$10 per Mbps per month. The bursting option was ordered and the Burst MRC was computed as \$11.00 per megabit.

The traffic graph below is used to illustrate the traffic load. The 95th Percentile (the 95% of 5-minute samples) for the 30-day period is 2.6 Mbps (as shown by the red line in the graph below). The 95th percentile utilization is higher than the CIR bandwidth, so billing scenario #2 (above) would apply.



The Burst Traffic is computed as 2.6 Mbps minus 2.0 Mbps, yielding 0.6 Mbps. This Burst Traffic rate is multiplied by the Burst MRC, 0.6 Mbps times \$11 per Mbps, to yield a Burst Charge of \$6.60. This Burst MRC is then added to the Internet CIR MRC. The billed utilization would look like:

2.0 Mbps Internet CIR MRC @ \$10.00/Mbps	\$20.00
0.6 Mbps Burst MRC @ \$11.00/Mbps	\$6.60
Total Internet Services Access MRC for the month	\$26.60

AVAILABILITY AND RESTRICTIONS

Burstable Bandwidth is available on all Lighttower Internet Access Services, upon request, to locations delivered on Switched Ethernet technology with maximum burst rates up to 1G available on a 1G port. Availability of a 10G port and bursting availability on a 10G port is reviewed on an individual case basis.

Where burst traffic is ordered, it is offered with no SLA guarantee. Standard Internet Access Service SLAs only apply to CIR traffic.

SAMPLE INVOICE

Lightower Fiber Networks
80 Central Street
Boxborough, MA 01719



Bill to:

Default Customer For Projects
Attn:
Street Address
City, MA 00000

Customer ID: 00000000
PO Number:
Invoice Number: 00000000-20140507266
Invoice Date: 05/01/2014

Due Date: 05/07/2014
Terms: Net 30 Days

Qty	SERVICE DESCRIPTION	MRC/ MRC	Billing Period Start Date	Billing Period End Date	Service Base Rate	Extended Amount
1	Dedicated IP - Burstable . 100Mbps . IP Service 200 Franklin Street, Boston, MA	MRC	05/01/2014	05/31/2014	600.00	600.00
1	Dedicated Transport . 100Mbps . IP Transport 200 Franklin Street, Boston, MA	MRC	05/01/2014	05/31/2014	400.00	400.00
10	Bursting Charge Bursting Charge 10M	MRC	05/01/2014	05/31/2014	11.00	110.00
1	Dedicated IP - Burstable . 200Mbps . IP Service 55 Broad Street, New York, NY	MRC	05/01/2014	05/31/2014	300.00	300.00
1	Dedicated Transport . 200Mbps . IP Transport 55 Broad Street, New York, NY	MRC	05/01/2014	05/31/2014	200.00	200.00
55	Bursting Charge Bursting Charge 55M	MRC	05/01/2014	05/31/2014	2.75	151.25



Estimate

Customer ID: 00000000
Invoice Number: 00000000-20140507266
Invoice Date: 05/01/2014
Default Customer For Projects

Qty	SERVICE DESCRIPTION	MRC/ MRC	Billing Period Start Date	Billing Period End Date	Service Base Rate	Extended Amount
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Total Service Charges 1,761.25
Other State Fees 0.34
State Sales Tax 43.32
State Gross Receipts/Excise 5.16
Surcharge on State Excise 1.22

Please Remit Payments to: Lightower Fiber Networks
PO Box 30279
New York, NY 10087-0279

Total Current Charges \$1,811.29

Grand Total Due (USD) \$1,811.29

Due Date: 05-07-2014

Please remember to include your Invoice Number.

For Billing or Payment Inquiries:
Billing: billing@lightower.com
Phone: (978) 264-6003
Fax: (978) 264-6103

INTERNET ACCESS

Unsurpassed Performance, Reliability, and Flexibility

OVERVIEW

Lightower's high-capacity, diverse fiber network, combined with high speed connections to key peering points and data centers, ensures availability and responsiveness for your employees and clients. With optional capabilities such as bursting, high-availability connectivity, or sharing IP access over a Wide Area Network (WAN), Lightower Internet Access delivers a superior experience and a better overall value.

Whether you need dedicated private circuits that guarantee performance Internet bandwidth or you prefer cost-effective switched Ethernet access, Lightower can tailor a solution to your requirements for applications such as:

- VPN access for individuals and remote sites
- E-mail, IM and social media traffic
- Internet research
- Collaboration between offices and with customers
- Viewing streaming educational videos
- VoIP and video conferencing
- Customer access to e-commerce applications
- Access to cloud-based applications
- Data backup and archiving



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INTERNET PRODUCTS

PRODUCT	DESCRIPTION
Internet Access	Available at any Lighttower datacenter or interconnection facility
Dedicated Internet Access	Includes transport and access to the customer location
Burstable Internet Access	Allows customer to commit to a bandwidth, with ability to exceed that as needed
Bundled Internet Access	Internet Access bundled with Ethernet networking for additional value

BENEFITS

Reliable High Speed Access

Today's enterprise is dependent on reliable Internet Access to support a wide range of business functions from email and web browsing, to supporting access to mission critical applications. Lighttower's Internet Access Service offers a high-speed solution that connects your business locations efficiently and affordably. Whether you are looking for customizable routing configurations, low latency, network diversity, the ability to execute critical business transactions with real-time applications, or increased capacity, Lighttower offers a host of benefits that make us the smarter choice for Internet Access:

- Carrier-Grade Reliability
- Over-Engineered for Performance
- Multiple Tier-1 Peering Points
- All-Fiber Solutions
- Robust Availability

FEATURES

Superior Performance and Reliability by Design

The combination of multiple Tier-1 interconnection points, coupled with award-winning service and support ensures that Lighttower's Internet Access Service will be reliable and available when needed. Our Internet Access Service offers flexible connectivity options with bandwidth rates from 50 Mbps up to 10 Gbps, with the option to burst above subscribed bandwidth rates when needed.

Lighttower offers a host of enterprise-class services that include flexible and scalable connectivity, reliability and protection, and network services designed to ensure that your business' online activity never skips a beat.

FEATURES (cont.)

Resiliency

- Multiple, private and geographically diverse Tier-1 Internet connections ensures reliable access to the Internet
- Robust metro and backbone network infrastructures
- Fiber routes diverse from other service providers
- 24x7 geographically diverse NOC monitors network status

Network Services

- Additional IP addresses available to meet your needs
- IPv6-compatible, dual stack connection capable
- Configuration of routing and primary/secondary DNS registration
- Connectivity and performance verification
- E-LAN Internet Access sharing support

LOW LATENCY IN EVERY INDUSTRY

Low latency has become a major area of focus across a variety of industries as customer's applications require more efficient network connectivity.

New, bandwidth-intensive applications and increased cloud adoption are fostering innovative business operations across industries. The potential performance delays associated with these applications have implications that range from frustration due to slow load times and delayed graphics to far more serious and costly consequences.

Once an imperative only for the financial services industry, low latency connectivity is now important across all major industries as minimizing delays in transactions and increasing data speed are critical to business success.

EDUCATION

In education, high speed networking solutions allow institutions to leverage innovative technologies that provide new ways of teaching, learning, and collaborating. Gone are the days of the simple chalkboard. The "new" classroom relies on high speed connectivity and includes applications such as video conferencing, live-streaming, rich learning content, e-learning platforms, presentation applications, and dynamic administration tools.

Network speed in the classroom creates a more innovative, interactive learning environment. While applications such as live-streaming and electronic whiteboards vastly improve creativity and collaboration, they become less effective if they are sluggish or delayed. In a 2008 survey of students in higher education conducted by The Economist, 52% of the respondents cited collaborative technologies as the top online tool to improve academics. Students can use high speed connectivity to complete coursework outside their class or dorm rooms in student centers, quads or outdoor spaces, creating their own dynamic learning environments and promoting collaboration.

Campuses across the world are accessing cloud-based applications over fast, secure low latency networks. Cloud computing solutions, such as Software as a Service (SaaS) provides educational institutions increased flexibility and accessibility to information and applications that can be used both on- and off-premises. By providing consistent, high speed access to information systems and research data, low latency networks facilitate connections between key stakeholders and other academic institutions worldwide.

HEALTHCARE

For the healthcare industry, high speed networks are integral to the performance of critical applications that drive superior healthcare, including Picture Archiving Communications Systems (PACS), diagnostic imaging, Electronic Medical Records (EMR), telehealth applications, and patient portals. Faster assessments, diagnoses and collaboration between doctors, hospitals, and outpatient facilities encourage faster diagnosis and recovery, making low latency networks a crucial component to superior quality of care.

Low latency networks support mobile healthcare applications and equipment that make patient information readily available to the medical staff that needs it. Available on laptops, PDAs, and mobile PC carts, these applications require reliable anytime access to information, regardless of physical location.



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Healthcare sector decision makers rely on low latency networks to leverage the latest cloud-based applications for increased redundancy and back-up in a highly scalable, functional manner. According to a 2010 report by Accenture, approximately one-third of the healthcare sector decision makers use cloud applications, 73% of whom indicate that they are planning to move even more applications to the cloud.

(Source: <http://www.informationweek.com/news/healthcare/interoperability/225700843>)

MEDIA

The media industry has undergone an extreme transformation in recent years, with digital technology vastly increasing the variety and quality of content, delivery methods and viewing devices that must be supported.

A high speed network is crucial for today's deadline-driven media industry, where real-time, low latency connectivity is essential. From live-streaming breaking news, television shows, and movies over the Internet, to applications that allow media companies to transfer large files, images, and videos from the field to studios around the world; delays in speed and performance not only sacrifice the overall impact of the content, but can also result in a significant loss in revenue.

GOVERNMENT

High speed networks provide a faster, more efficient infrastructure to improve interaction between communities and their governments. Key applications that require reliable, low latency connectivity include transportation management, emergency response and general commerce. State and local governments need the ability to support their growth at a price that meets today's fiscal challenges. Citizens want access to self-service portals and information. Low latency networks are a cost effective way to meet these needs.

LEGAL

As more and more paper processes within the legal system are being replaced with electronic files, law firms and legal services businesses are relying on data centers and high capacity networks to ensure uninterrupted access to this data at all times. During legal cases, firms must often share large, bandwidth-intensive files between multiple offices quickly and securely. Meeting deadlines is especially critical in this industry which often necessitates that work occur around the clock. Network delays can slow productivity and make it difficult to meet those tight deadlines. Law firms, and the businesses that support them, require a network infrastructure that can support productivity through the lowest latency network possible, ensuring secure, high speed access to critical files 24x7.

CONCLUSION

Speed is increasingly on the 'short list' for network must haves— alongside critical qualities such as security, scalability, bandwidth, and unique Classes of Service (CoS) to give customers the flexibility to choose the most appropriate network infrastructure for their unique needs. Low latency is beneficial to nearly every industry, and has become a major focus for organizations seeking an experienced and mindful network provider that will expertly optimize high speed connectivity, minimize network-related costs and achieve the customer's strategic business objectives.

Low latency requirements for the Education, Healthcare, Media, Government, and Legal industries all depend on the same foundation, the ability to design a network tailored to client's requirements. To ensure your network is ideally suited to support your business needs, Lighttower Networks suggests you consider the following:

For high speed networks, look for low latency and high capacity. It will enhance your application performance.

High speed networks provide an ideal platform for important applications across any industry, such as video conferencing, livestreaming media, rich content, dynamic administration tools, and access to real-time information.

Utilizing cloud-based web applications via a low latency network will dramatically improve reliability and accessibility which can ensure continued business productivity through cost effective, managed solutions.

A low latency network is ideal for today's deadline-driven society, providing invaluable, real-time connectivity.

Low latency networks save organizations considerable time and money by providing a faster, more efficient means of collaboration between employees, customers, staff, students and enterprises overall.

MANAGED PRIVATE OPTICAL NETWORKS

Tailored and Customized for Any Application

OVERVIEW

Demanding, bandwidth-hungry applications such as high-speed trading, synchronous replication, content delivery, and some Cloud Services can place significant demand on available resources and capacity for large corporations. The ability to upgrade network services in a timely manner is critical to business success.

Sometimes, standard off-the-shelf service offerings don't meet the needs of businesses and carriers. Networking requirements have become more complex, and as a result, multiple technologies, protocols and applications need to be supported across a wide area via private custom networks.

Partnering with Lighttower to deploy custom, diverse, high capacity, low latency connectivity along with specialized support services provides you with the stringent performance, latency and diversity of a private network — while off-loading the burden of designing and operating your network. This allows you to fully focus on your core business needs.

A managed private optical network from Lighttower can augment your IT staff with flexible, custom designed solutions to meet your technical and business requirements. Your business will be able to access Lighttower's award-winning network, the latest optical technologies and experienced support staff, so that you can enjoy a turnkey, fully managed private network solution.

BENEFITS OF A MANAGED PRIVATE OPTICAL NETWORK

- Obtain access to Lighttower's unique network assets including unique rights-of-way, diversity, ultra-low-latency and deployed equipment, which would be cost prohibitive to duplicate yourself.
- Use these assets and services to deliver application and transaction performance that leapfrogs your competition who use off-the-shelf solutions.
- Integrate network connectivity into your application or service, providing a turn-key solution completely under your control.
- Augment your IT staff with networking experts who use proven best practices for network design, installation, operation and upgrade.
- Eliminate large, upfront CapEx needed to design and build your own network, while speeding time to market in the process.



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MAKE OUR NETWORK YOUR NETWORK

Lighttower will work with your technical staff to custom design a solution that leverages Lighttower's extensive experience in designing, deploying and operating state-of-the-art technologies, to meet your stringent needs.

- **Design:** Many of today's businesses find themselves in need of a network designed and built to support their specific networking requirements. However, the time and costs associated with building a private network, along with the level of specialized knowledge and expertise required to undertake this endeavor, make this option unfeasible for most companies to even consider. Lighttower can provide the technical expertise and proven experience to design, build and maintain a private optical network customized to your exacting requirements.
- **Equipment:** Flexible equipment procurement options are available to help you meet your CapEx and/or OpEx constraints.
- **Installation:** Lighttower will provide a Project Manager to oversee all aspects of your equipment procurement, network build-out, testing and deployment-starting with a detailed project plan that is created and reviewed with your technical staff.

- **Network Monitoring and Support:** Lighttower's Network Operations Center (NOC) is focused on providing high quality network management supporting Dark Fiber, Dense Wave Division Multiplexing (DWDM) and Ethernet systems. Customers can choose to utilize Lighttower's NOC technicians as a primary or a backup augment to their IT staff. Lighttower will perform basic event recognition, respond to alarms and alerts and log relevant information. The Lighttower surveillance technician will notify you of the condition and our response. Lighttower will also respond to trouble calls from your technical staff, investigate issues and provide a timely response and action plan. Lighttower technicians will troubleshoot and isolate faults and will notify your staff in accordance with mutually agreed procedures.

Lighttower Managed Private Optical Networks can be fully customized to meet your needs. To learn more, please contact your Lighttower Account Representative, visit www.lighttower.com, or call 888.LT.FIBER.

SONET

High Bandwidth, High Reliability, High Predictability

OVERVIEW

If your business applications need a reliable, predictable, high bandwidth networking solution, Lighttower's SONET Service is the answer. Lighttower's SONET Service enables customers to connect multiple locations with a dedicated, protected, high-speed service.

Customers may choose channelized bandwidth which provides STS-level switching, or concatenated bandwidth to provide larger, single channel transport for high level data applications. Lighttower's ring-based architecture for SONET Service provides maximum availability.

In today's increasingly demanding IT environment, many key business drivers can be fulfilled through SONET Services:

- Seamless connectivity between geographically diverse sites
- High bandwidth requirements to support the latest business applications
- Data center connectivity
- Disaster recovery and business continuity solutions
- Flexible network services that adapt to new project requirements
- Backhaul for private PBX voice traffic
- Cost-effective solutions that fit within today's IT budgets
- Available both within the metropolitan area and between regions



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TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Bandwidth	Dedicated DS-1 to OC-192
Protection	Full SONET protection with route diverse ring architecture in most areas
Network Technology	Utilizes Lighttower's diverse metro DWDM network and metro fiber
Availability	Over 8,500 service locations from Portland, ME to Washington, DC and out to Chicago and internationally in Toronto and London with the expertise to add additional locations
Management	24x7 monitoring and surveillance
Protocol Support (over SONET)	Circuit switched voice, ATM, frame relay, IP, and video

PROTECTION SPECIFICATION	LIGHTOWER TARGET
Availability	99.99%
Bit Error Rate	1x10 ⁻⁹
Error Free Seconds	1x10 ⁻⁹
Mean Time to Repair (MTTR)	4 Hours

Specific protection and performance metrics will be determined by your solution design and your Lighttower Service Level Agreement.

BENEFITS

Custom Bandwidth Delivery for all Your Business Needs

Lighttower's custom design process delivers the bandwidth needed to meet your requirements on time and on budget. Lighttower's fiber network leverages unique rights-of-way enabling business continuity solutions that are geographically diverse from the incumbent provider. Combining the metro service with long-haul connectivity between metropolitan areas offers a total solution for businesses with a presence in multiple cities. Lighttower monitors its services 24x7 to ensure reliability and responsiveness

Lighttower's SONET Service provides your business with the following host of benefits:

- A wide range of bandwidth options means you can select and pay for only the bandwidth you need
- Multi-Application Support – Supports all common networking requirements: circuit switched voice, Asynchronous Transfer Mode (ATM), Frame Relay, and Internet Protocol (IP)
- Customized, concatenated or channelized configurations provide flexibility in payload size
- Dedicated, fully monitored service provides the highest levels of service availability and reliability
- Unique rights-of-way provide an additional layer of reliability and security

FEATURES

Maximum Availability

Our solution provides the near real-time restoration needed to support mission critical applications with rates starting at OC-3 ranging up to OC-192 available in concatenated or channelized bandwidth. Lighttower's robust ring based architecture provides the maximum availability you expect from SONET services.

Lighttower's SONET Service includes:

- Scalable, dedicated bandwidth from OC-3 to OC-192
- Supports channelized or concatenated payloads
- Diverse, protected, ring-based architecture
- Metropolitan and long haul services available
- 24x7 proactively monitored services
- Survivable and reliable, diverse network utilizing unique, utility rights-of-way
- Standards-based protocol for ease of interoperability

ULTRA LOW LATENCY AND ITS IMPORTANCE ON BUSINESS PERFORMANCE

The financial services industry is a buzz with talk of ultra low latency and its impact on business performance for financial services institutions. This paper explores the importance of ensuring connections are provisioned on a low latency network and other factors to consider when looking to reduce latency and gain a competitive advantage.

WHAT IS LATENCY?

By definition, latency is the amount of time it takes a packet to travel end-to-end on a network. Simply put, latency equals time and virtually every major problem with network performance can be related to time. Any delay in signal or packet transmission can cause problems ranging from simple annoyance to significant loss of time and money for companies.

In optical networks there is a built-in limitation on packet speed—no signal can travel faster than 4.5 km/ms, which is the speed of light through a fiber medium. However, the more obstacles or delays placed in the way of a packet, such as network interfaces and signal conversions from optical to electrical and back (OEO), the greater the time delay or latency. The total distance the packet has to travel, especially if it traverses multiple networks, then compounds this problem. The result can be a disrupted transmission as packets become delayed.

Sudden spikes in activity can also introduce latency into packet transmissions. In financial services, sudden spikes in activity, such as the opening and closing bells or other abrupt market movements can create noise and static in the system, causing it to slow down when it's needed most. In an industry where time truly is money; the importance of ultra low latency connections is critical.

THE CHALLENGES

As data traffic continues its dramatic growth, financial services institutions are facing significant challenges. Networks are being overwhelmed in an attempt to handle the demands of automated trading platforms; competition is quickly heating up; data and backup recovery efforts are gaining importance; and corporate and federal regulations are impacting transaction procedures. However, none of these challenges are greater than those posed by network latency. Latency can cripple transaction-based applications resulting in negative outcomes and potentially lost dollars for companies.



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Furthermore, as firms get more serious about lowering latency in their network, they need to tackle the largest contributing factor — propagation delay, which is attributed to the speed of light over fiber. After ensuring the shortest mileage routes between points, the only way to eliminate this is to physically move servers closer to the exchanges. Rather than moving offices, the best solution tends to implement servers in secure third-party data centers located closer to a trading venue. It's here that proximity to strategic connection end points and the availability of sophisticated data centers and colocation facilities becomes increasingly critical to financial services.

THE SOLUTION

For financial services institutions, latency introduces primary concerns related to lost productivity and the ability to beat competitors to the punch when executing trades and orders. It has been estimated that even a millisecond reduction in latency can result in nearly a hundred million dollars in cost savings and added revenue for a major financial institution. These advantages aren't reserved solely for market giants. Decreased pricing and increased access to state-of-the-art fiber optic networks — such as Lighttower's Xtreme Ultra-Low Latency Network — are allowing mid to large-sized institutions to drive down latency, reduce management complexity and boost overall network resiliency and availability.

Most end-to-end network solutions employ a mixture of smaller copper and fiber-based networks, connected by a variety of interface and switching equipment, all provisioned by different vendors and carriers. As a result, it's very difficult — if not impossible — to calculate true network latency, limiting the boundaries to which SLAs can be enforced. That's why Lighttower provides the ideal solution — end-to-end, privately-owned fiber networks providing high-capacity transport services for a wide variety of corporations, carriers, financial institutions, and government agencies. The result? The lowest possible latency in the industry, with virtually no disruption of service and easily-scalable bandwidth availability.

Lighttower's Xtreme Ultra-Low Latency Network — a one-of-a-kind, high capacity, high availability network ring dedicated solely to serving financial services — has points of presence placed for optimal connectivity and to accommodate high growth locations. The lowest latency connectivity is offered between sites with the support of any-to-any connectivity as well as the ability to keep traffic within New Jersey or extend to New York as needed.

Lighttower controls its entire network, end-to-end, and deploys best-in-breed network hardware for the fastest, most reliable transport service and lowest latency network possible. And because Lighttower owns the network and installs its own optical fiber, routers and switches, it can provide accurate, dependable latency calculations backed by strong SLAs.

While the "how" of a firm's network connection is critical, "who" you're connected to is equally important to a firm's competitive advantage. Lighttower serves the top North American Financial Services Centers — New York, New Jersey, Chicago, and Toronto, providing direct connections between leading financial exchanges and major colocation facilities to meet the business needs of those in the financial services industry.

THE RESULTS

A full performance guaranteed ultra low latency network

Complete network ownership and end-to-end provisioning enables guaranteed latency calculations backed by rock-solid SLAs

Connectivity and proximity to leading financial exchanges and data centers relevant to financial services companies

Any-to-any connectivity across the Xtreme Ultra-Low Latency Network offering the lowest latency connectivity between sites.

VIDEO TRANSPORT

World Class Video Transport with Flexible Format Support

OVERVIEW

Lighttower's Video Transport Service reliably moves your uncompressed or compressed video at blazingly fast speeds over our all-fiber network. Offering the perfect combination of performance and value, Lighttower Video Transport connects the video content your customers want with the quality they demand.

Lighttower delivers leading-edge, standards-based technologies for transporting your ASI, SD-SDI, HD-SDI, and 3G-SDI video formats. Optional Ethernet connectivity, delivered from the same network equipment, enables additional flexibility and value. What's more, Lighttower's Video Transport Service forms the backbone of our Ultimate Media Platform, which offers unique connectivity to stadiums and arenas, media venues, video distribution hubs, and broadcast centers throughout the Northeast.

Lighttower offers the following as part of our Video Transport Service:

Video Transport: Dedicated networking of ASI, SD-SDI, HD-SDI, and 3G-SDI video formats

- Compressed or uncompressed
- Fully dedicated transport
- Optional parallel Ethernet connectivity
- State-of-the-art technology, all-fiber networking

Managed Video Transport: Video Transport service with enhanced video management features

- Fully-managed transport
- Fault alarm forwarding, test pattern generation, in-service port monitoring

Enhanced Services: Designed to complement Lighttower Video Transport

- Fault alarm forwarding available
- In-service port monitoring available
- Integrated Ethernet Services
- JPEG 2000 support available

End-to-End Fiber-based Video Transport: Lighttower engineers can custom design a solution that meets your specific video transport requirements. Our extensive network access into video distribution hubs, data centers, and venues means that we can take your video wherever it needs to go.



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TECHNICAL SPECIFICATIONS

SOLUTION	DESCRIPTION	FEATURES
Video Transport	Dedicated networking of ASI, SD-SDI, HD-SDI, and 3G-SDI video formats	<ul style="list-style-type: none"> • Compressed or uncompressed • Fully dedicated, physical layer • All-fiber solution
Enhanced Video Transport	Video Transport service with enhanced video management features	<ul style="list-style-type: none"> • Fault alarm forwarding • Test pattern generation • In-service port monitoring
Video Transport Productivity Suite	Video Transport or Enhanced Video Transport plus dedicated Ethernet Services	<ul style="list-style-type: none"> • Comprehensive solution • Integrated Ethernet Service for networking & IP access • All physical layer security

BENEFITS

Built on the foundation of our all-fiber network, Lighttower's Video Transport Service is designed with your future networking needs in mind with virtually unlimited capacity, unmatched network density and rock-solid reliability. This service is backed by industry-leading Service Level Agreements (SLAs) ensuring up to 99.999% uptime, and are managed 24/7/365 from our state-of-the-art Network Operations Centers.

Lighttower's Video Transport Services provide your business with the following host of benefits:

- Carrier Grade Reliability
- Physical Layer Security
- Customized Configurations
- Lower Operational Costs
- Lower Capital Costs
- Advanced Management Functionality

FEATURES

- Flexible Video Format Support
- Compressed or Uncompressed
- Up to 99.999% Availability
- Dedicated, All-Fiber Access
- Integrated Ethernet Service (Available)
- JPEG 2000 support (Available)
- 24/7 Monitoring

WAVELENGTHS

Bandwidth-Intensive Applications Demand High-Performance Connectivity

OVERVIEW

In an always connected society where more new content was created in the last two years than all previous years combined, enterprises and service providers alike require high-performance capacity for bandwidth-intensive applications as part of their day-to-day operations.

From service providers interconnecting their backbones, to universities performing R&D, to financials facilitating electronic trading, the flood of bandwidth-intensive applications is driving a real and intense need for wavelength services to accommodate them. Add in the requirements for back-up and recovery at data centers and access to Cloud services, and it becomes very clear why wavelengths have become a popular service option for our customers.

Lighttower's Wavelength Service relieves capacity constraints and opens the door to high performance networks that improve application performance.

Offered as a fully managed, private, point-to-point service, Lighttower Wavelengths are delivered over a state-of-the-art Dense Wave Division Multiplexing (DWDM) network that can scale with the growth and needs of your business.

BENEFITS

Flexible, Affordable, Reliable

When capital is constrained or when longer distances make Dark Fiber a poor fit, Lighttower Wavelengths provide a turn-key solution, balancing the infrastructure and economics required to take your business operation or application to the next level.

Lighttower's Wavelength Service is a "virtual fiber" service, providing dedicated, high capacity spectrum. The service has multiple protection options for mission critical applications and high availability requirements. Lighttower Wavelength Service is also available in ultra-low and low latency configurations for real-time applications like video conferencing, media, content distribution and financial services transactions.

Lighttower's Wavelength Service is backed by many best-in-class benefits:

- **Secure:** Point-to-point dedicated bandwidth with layer-1 security
- **Scalable:** Increase capacity as requirements grow
- **Easy to Deploy:** The features of dark fiber with the ease of a managed service
- **Cost Effective:** Low CapEx, economical, point-to-point bulk bandwidth
- **Fully Managed:** Proactive monitoring ensures high availability and reduces network management requirements and resources
- **Customizable:** Protected and unprotected configurations available
- **Diverse Routes:** Lighttower's network leverages unique, utility rights-of-way to improve network reliability and survivability
- **Supports Multiple Protocols:** Seamless support for IP, Ethernet, SONET, and SAN services
- **Standards-based:** DWDM equipment ensures multi-vendor interoperability



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TECHNICAL SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Bandwidth	OTU 1-4 Fiber Channel, 1 GigE, 10 GigE, 40 GigE, 100 GigE, OC-x
Protocol Independent	Open interfaces support all major transport protocols: Ethernet, IP, SONET, Fibre Channel, SAN, SD/HD-Video
Optional Route Diversity	Implement service on multiple routes to further ensure the highest availability possible
Optional Optical Protection on Diverse Routes	Switching between active and back-up paths limit the impact of network events
Availability	Available both with the metro and on the long haul network

PROTECTION SPECIFICATION	LIGHTOWER TARGET
Availability	99.99%
Bit Error Rate	1×10 ⁻⁹
Error Free Seconds	99.9%
Mean Time to Repair (MTTR)	4 Hours

Specific protection and performance metrics will be determined by your solution design and your Lighttower Service Level Agreement.

FEATURES

Lighttower's Wavelength Service enables the extension of LAN infrastructures for WAN, MAN or SAN connectivity

Lighttower's Wavelength Service provides dedicated bandwidth to guarantee performance when you need it at rates from 1 Gbps up to 100 Gbps. Our private, geographically diverse fiber network, along with optional diverse circuit design, provides a robust solution for business continuity alternatives. Lighttower monitors its network 24x7 to ensure reliability and responsiveness.

Lighttower's Wavelength Service includes the following:

- Flexible, transparent bandwidth that supports most major protocols
- Protected and unprotected configurations available
- Diverse fiber routes available
- Dedicated bandwidth at full line rate
- 24x7 network surveillance and monitoring

LTS Buyer LLC

Question II.A.11. Part 1

Identify the five most recent Requests for Proposals (RFPs) for which you were selected as the winning bidder to provide each of the following: (a) *Dedicated Services*; (b) *Best Efforts Business Broadband Internet Access Services*; and, to the extent different from (a) or (b), (c) some other form of high-capacity data services to business customers. (The following remaining parts of this question are optional.) In addition, identify the five largest RFPs (by number of connections) for which you submitted an unsuccessful competitive bid in 2013 for each of (a) *Dedicated Services*; (b) *Best Efforts Business Broadband Internet Access Services*; and, to the extent different from (a) or (b), (c) some other form of high-capacity data services to business customers. For each RFP identified, provide a description of the RFP, the area covered, the price offered, and other competitively relevant information. Lastly, identify the business rules you rely upon to determine whether to submit a bid in response to an RFP.

ANSWER:

[BEGIN HIGHLY CONFIDENTIAL] [REDACTED] [END HIGHLY CONFIDENTIAL] All information is Highly Confidential.

LTS Buyer LLC

Question II.A.11. Part 2

Identify the business rules relied upon to determine whether to submit a bid in response to an RFP.

ANSWER:

[BEGIN HIGHLY CONFIDENTIAL] [REDACTED]
[REDACTED]. [END HIGHLY CONFIDENTIAL]

LTS Buyer LLC

Question: II.A.18.

If you offer *Dedicated Services* pursuant to an agreement or *Tariff* that contains either a *Prior Purchase-Based Commitment* or a *Non-Rate Benefit*, then explain how, if at all, those sales are distinguishable from similarly structured *ILEC* sales of *DS1s*, *DS3s*, and/or *PBDS*.

ANSWER:

Not applicable.

LTS Buyer LLC

Question II.A.19

Provide the business justification for the *Term* or *Volume Commitments* associated with any *Tariff* or agreement you offer or have in effect with a customer for the sale of *Dedicated Services*.

ANSWER:

[BEGIN HIGHLY CONFIDENTIAL]

[REDACTED]

[END HIGHLY CONFIDENTIAL]

LTS Buyer LLC

Question II.C.1.

If you provide *Best Efforts Business Broadband Internet Access Services* to 15,000 or more customers or 1,500 or more business broadband customers in areas where the *ILEC* is subject to price cap regulation, then answer the following questions:

- a. Did you submit data in connection with the State Broadband Initiative (SBI) Grant Program for 2013?

ANSWER:

No.

If you answered “no” to questions II.C.1.a, then you do not need to answer any further questions in this section.

LTS Buyer LLC

Question II.D.1

Describe your company's short term and long-range promotional and advertising strategies and objectives for winning new – or retaining current – customers for Dedicated Services. In your description, please describe the size (e.g., companies with 500 employees or less, etc.), geographic scope (e.g., national, southeast, Chicago, etc.), and type of customers your company targets or plans to target through these strategies.

ANSWER:

Lightower uses limited advertising and promotion that is focused on medium to large businesses and other organizations. Typically Lightower will target any organization (in any industry) **[BEGIN HIGHLY CONFIDENTIAL]** [REDACTED] **[END HIGHLY CONFIDENTIAL]**. Geographically, Lightower confines its efforts to the area within the Lightower network footprint, which is essentially from Maine to Virginia and also Chicago.

LTS Buyer LLC

Question II.D.2

Identify where your company's policies are recorded on the following *Dedicated Service*-related processes: (a) initiation of service; (b) service *Upgrades*; and (c) service *Disconnections*. For instance, identify where your company records recurring and non-recurring charges associated with the processes listed above. If recorded in a *Tariff*, provide the specific *Tariff* section(s). If these policies are recorded in documents other than *Tariffs*, list those documents and state whether they are publicly available. If they are publicly available, explain how to find them. For documents that are not publicly available, state whether they are conveyed to customers orally or in writing.

ANSWER:

Lighttower's policies regarding (a, b, c) are set forth in service contracts executed by Lighttower and each customer. These service contracts have evolved over time and vary somewhat from customer to customer. These service contracts are confidential and not publicly available. The service contracts are always in writing.

LTS Buyer LLC

Question: II.F.8

Terms and Conditions Constraints

ANSWER:

LTS Buyer LLC is not providing an answer to this optional question.

LTS Buyer LLC

Question: II.F.9

Changing Transport Providers

ANSWER:

LTS Buyer LLC is not providing an answer to this optional question.

LTS Buyer LLC

Question: II.F.10

Purchases Solely for the Purpose of Meeting a Prior Purchase-Based Commitment

ANSWER:

LTS Buyer LLC is not providing an answer to this optional question.

LTS Buyer LLC

Question: II.F.11

For each year for the past five years, state the number of times and in what geographic area(s) you have switched from purchasing *End-User Channel Terminations* from one *Provider of Dedicated Services* to another.

ANSWER:

[BEGIN HIGHLY CONFIDENTIAL] [REDACTED] . [END HIGHLY CONFIDENTIAL]

LTS Buyer LLC

Question: II.F.12

Paying One Month Term Only Rates

ANSWER:

LTS Buyer LLC is not providing an answer to this optional question.