

CenturyLink Technology Solutions Service Guide

Financial ATS Network Services

This Service Guide sets forth the description of the following CenturyLink Technology Solutions ("CenturyLink") offerings, (collectively referred to hereinafter as "Service") including all technical details and additional requirements, if any:

- Financial ATS Network Service-Trading Network Connectivity ("TNC")
- Financial ATS Network Service- Exchange Connectivity ("EC")

This Service Guide is subject to and incorporated into the Master Service Agreement and Service Schedule between the parties ("Agreement"). The specific details of the Service ordered by Customer will be set forth on the relevant Service Order.

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Financial Application Transport Service

Service Description

Financial Application Transport Service (Financial ATS) is a network service that includes the following:

- A port on a Provider Edge device that can be used to deliver market data, available in the following bandwidth increments: 2Mbps, 10Mbps, 100Mbps, 1Gbps and 10Gbps
- Access to market data from an exchange through the Financial ATS port to a customer site or data center environment;
- CenturyLink provisioned circuit or cross-connect to customer site or data center environment;
- CenturyLink owned and managed Customer Edge device;
- End-to-end monitoring and management of data flow;
- Repair or replacement of any service element upon failure.

Exchange Connectivity

An exchange is defined as any organization, association, or group which provides or maintains a marketplace where securities, options, futures, commodities, or other financial instruments can be traded. Market data is the collection of actionable information made available in electronic form from an exchange. Exchange Connectivity is electronic access to market data generated by the exchange.

Trading Network Connectivity

Trading Network Connectivity (TNC) is a network service that includes the following:

- a VPN port on a Provider Edge device that is available in incremental bandwidth steps from 2Mbps through 1Gbps;
- access to a secure, private extranet created by CenturyLink within a VPN, that connects buyers of financial instruments to the brokers and dealers of those instruments they specify so they can trade electronically;
- support of the FIX protocol for electronic trading transactions;
- CenturyLink provisioned circuit or cross-connect to customer site or data center environment;
- CenturyLink owned and managed Customer Edge device;
- end-to-end monitoring and management of data flow;
- repair or replacement of any service element upon failure.

The Service Level Agreement ("SLA") for this service is covered by the "Financial ATS Service Level Agreement."

Service Provisioning

CenturyLink Managed Service – Customer Installation

Installation of the Service will include delivery of the ATS access circuit to the Customer Premises. Once the ATS port on the CenturyLink Provider Edge is installed, the CenturyLink installation engineer will work with the Customer on IP address space requirements and other tasks required to deliver the Service. IP addressing is subject to the CenturyLink IP Policy Document and the Customer justification process. The CenturyLink installation engineer will then configure the Services on the CenturyLink network. With CenturyLink provided and managed CPE, the installation will consist of procuring, staging, configuring, and installing a router or a bridge, along with a dial line and modem for out-of-band management at the Customer's Premises.

Customer is responsible for space, power and cooling for CenturyLink provided CE and Out-of-Band modem. Customer is responsible for circuit and POTS line extensions from telco demark to equipment. Customer is responsible for any applicable third party charges to extend circuit past telco demark.

If Customer's bandwidth utilization exceeds contract port bandwidth, CenturyLink will notify Customer and give 60 days to place an upgrade order. After 60 days CenturyLink reserves the right to rate limit bandwidth at the contract rate.

CenturyLink will arrange and pay for a standard (POTS) telephone line (with direct inward dialing) for each Customer site located at the Customer's Premises to enable CenturyLink to perform remote network management functions. CenturyLink will not be responsible for any problems related to the delivery of the Service (including any otherwise applicable SLA) if this telephone line is not available or if it is not functioning properly at all times.

Monitoring, Fault Reporting and Service Restoration

CenturyLink Managed Service Customer Support

Once the Service is operational, CenturyLink will ping the CPE on 12 second intervals. If 15 consecutive ping attempts fail, this implies the device will have been off-line for three minutes. The Customer Premises will be reported as "unresponsive" and the Customer will be notified and CenturyLink will begin troubleshooting.

Service Note: CenturyLink uses a TDM multiplexing protocol called GFP (Generic Framing Procedure) for delivering Ethernet over nxT1 bonded access service. If any of the T1's in an nxT1 bundle fail, CenturyLink will be notified automatically through the circuit monitoring process and begin troubleshooting. The remaining T1's will continue to carry Customer traffic, though at reduced capacity, until such time that Service is fully restored. This is applicable to all CenturyLink ATS offerings, whether Managed or Unmanaged, where CenturyLink provides the circuit.

The following is included with the Service:

- Installation and configuration of necessary hardware
- Core-based firewall rule sets
- Network connectivity as ordered by Customer (subject to minimum bandwidth requirements)
- Connectivity at the Real Time Quality of Service
- Route Diversity where possible

- End-to-End connectivity monitoring
- Issue management and escalation
- Exchange market data feeds selected by Customer
- Troubleshooting of CenturyLink-provided components
- Coordination with Telco if circuit fails on CenturyLink-provisioned lines
- 24x7 Support and Help Desk
- IP addresses assigned to CenturyLink hardware devices

The following is **not included** with the Service:

- Direct access to network engineering. All initial contact goes through the CenturyLink Response Center.
- Customer on-site spares at Customer Premises (other than devices spared as part of another CenturyLink Managed service) or if mutually agreed otherwise in the Agreement between the parties.

Additional Service Requirements

In order to access authorized Service Connectivity, Customer must execute the appropriate agreements and forms directly with the Exchanges. Additional information about this approval process is referenced in CenturyLink' Exchange Approval Process document which is available upon request.

Notwithstanding anything to the contrary in the Agreement, Customer agrees to the following terms for Service:

Exchange

- Customer acknowledges and agrees that the Exchanges may have particular configuration, security, operational, connectivity and use guidelines and testing protocols for their data feeds and that the Service are provided subject to compliance with such guidelines and protocols.
- All trademarks and logos used by an Exchange shall remain the property of their respective owners and may not be used without the prior written permission of the owner of such marks or logos. Customer is responsible for obtaining any such prior written consent or permission.

CenturyLink Technology Solutions

- The Service distributes the data feeds of the Exchanges and Customer acknowledges that the Service is dependent upon the availability of such data feeds from the Exchanges. Accordingly, Customer acknowledges and agrees that CenturyLink shall be authorized to, without liability or further obligation to Customer, interrupt or terminate the Service if expressly instructed to do so by the Exchange. CenturyLink shall have no liability to Customer if the Exchange disrupts or terminates a data feed to the Customer.
- CenturyLink shall have the right to pass through to Customer new fees and fee changes applicable to the Service that are imposed by the Exchanges.
- CenturyLink reserves the right and is authorized to provide information about Customer's Service to the Exchange in order to satisfy CenturyLink' reporting obligations to such Exchange. Such information may include, without limitation, Customer name and address, data feed locations,

individual location contact information, level of service, transmission protocol, Terminal/Display information, installation/termination dates, IP Addressing, Exchange products delivered by the requesting Exchange and technical diagrams as they relate to the deployment of the specific Exchange's data feed.

- Due to the consistently increasing levels of market information provided in connection with the Service, CenturyLink reserves the right and is authorized to, upon prior written notice, pass through to Customer increased bandwidth requirements applicable to the Service that are imposed by the Exchanges or required to accommodate increased data output from the Exchanges. CenturyLink reserves the right and is authorized to, without liability to Customer, suspend transmission of a Service at any time following notice of the same and until Customer implements connectivity at the prescribed bandwidth.
- To ensure compliance with Exchange reporting obligations CenturyLink will complete scheduled and random audits of customer market data. Customer acknowledges and agrees that CenturyLink shall be authorized to, without liability or further obligation to Customer, interrupt or terminate the Service if unauthorized market data is identified during an Exchange audit. The customer will be notified of any unauthorized market data and be given 48 hours to provide documentation showing that the market data has previously been authorized by the Exchange. After 48 hours CenturyLink will remove the market data identified until such a time that the Exchange has provided authorization.

Customer

- Customer shall maintain the required minimum bandwidth level associated with the relevant data feeds in order to ensure optimal performance and reliability of the data. Inadequate bandwidth can result in severe delays, loss of data and dropped connections, which may be further compounded by a re-connect and replay of the data. CenturyLink' ability to provide the Service and the applicability of any SLA are conditioned upon, and subject to, Customer maintaining bandwidth at the required level.
- Customer shall use all commercially reasonable efforts to prevent any unauthorized access to or use of the Exchange's content and ensure that Customer and its End Users do not upload or input any corrupted or malicious data to the Exchange's system.
- Customer shall notify CenturyLink and the Exchange immediately upon becoming aware of any such unauthorized access or use or the introduction of any corrupted or malicious data to the Exchange's system.
- Customer hereby acknowledges and agrees that: (a) the Exchanges have exclusive property rights in and to the market data; (b) the market data constitutes valuable proprietary and confidential information of the Exchanges; and (c) but for this Agreement, Customer would not have any rights with respect to, or rights to access or receive, any market data.
- Customer acknowledges and agrees that the Exchange retains the right to direct the Customer to terminate any external transmission or distribution of data feed content for any reason or no reason, in which event, upon notice from CenturyLink or the Exchange, Customer shall cease retransmitting market data as soon as practicable.
- Customer acknowledges and agrees that the Exchanges, in their sole discretion, may choose to discontinue the transmission of any or all market data or to transmit market data in a different form.
- Customer shall remain current with any fees assessed by the relevant Exchange for the use of its data and Customer acknowledges that failure to pay such fees could result in termination of data feeds by the Exchange. In the event that CenturyLink terminates the Service because the Exchange has terminated Customer's corresponding data feed service for nonpayment,

CenturyLink does so without any liability or further obligation to Customer and Customer shall be liable for early termination charges set forth in the Agreement.

- Customer shall give written notice to the relevant Exchange and CenturyLink of any change of name, nature or place of business at which any market data is received.
- Customer shall reasonably cooperate in connection with any inquiry regarding CenturyLink' interaction with the Exchanges by the SEC, CFTC, EU-FSA, NASD and/or any applicable self-regulatory organization.
- Customer represents that it is not and will not be engaged in the operation of any illegal business and will not use, or permit any person to use, the market data obtained, or any part thereof, for any illegal purpose.
- Customer shall strictly comply with all applicable Exchange rules and restrictions on retransmitting, distributing, or disclosing any market data to any other party, or otherwise incorporating any market data into any other client proprietary product or feed unless such permission has been expressly granted by the relevant Exchange.
- Customer shall not re-transport any market data on any WAN, satellite, or to any subsidiary, affiliate or to any third party unless permission to do so has been granted by the relevant Exchange.
- Customer acknowledges and agrees that neither the Exchanges nor CenturyLink will be liable in any way for (a) any inaccuracy, error or delay in, or omission of, (i) any market data, information or message or (ii) the transmission or delivery of any such data, information or message, or (b) any loss or damage arising from or occasioned by (i) any such inaccuracy, error, delay or omission, (ii) non-performance or (iii) interruption in any such data, information or message.

Customer Responsibilities

- Customer shall comply with the terms of this SERVICE GUIDE and shall perform all of its responsibilities under this CenturyLink Service Guide or CenturyLink' obligation to provide this Service in accordance with this CenturyLink Service Guide will be suspended until Customer does so.
- The Customer will not instruct or permit any other party to take any actions that would reduce the effectiveness of the Service.

Customer Installation Requirements

- In order for CenturyLink to properly configure and install Service, Customer must provide CenturyLink with a topology of their existing network.
- Customer must provide IP addresses for all network connections to the firewall, if applicable, the number of which will be determined by CenturyLink.
- Customer will give CenturyLink and others working for CenturyLink access to its Equipment immediately if there is a Service Outage and at reasonable times in all other situations.
- Customer will obtain all necessary permissions for the installation and operation of CenturyLink Equipment at all locations and times as may be applicable if Service is at a Customer Premises.
- In order for CenturyLink to provide the Service at a Customer Premises, the Customer must provide the necessary space, power, environmental conditions and security precautions at each Customer site, and otherwise prepare the site for the CenturyLink Equipment as follows:

Item	Requirement
Physical Environment	Predefined and adequate rack shelf or tabletop space for installation, with unobstructed entry for CenturyLink and others working for

	CenturyLink.
Electrical Power	Electrical outlet. Extension wiring if distance to the electrical outlet is greater than 6 feet. Power supply ready at installation location.
Support modem communication	Dedicated analog (dial-up) line for the support modem with inbound direct dial capability. Extension wiring if distance to the analog line termination is greater than 6 feet.
LAN Connectivity	Ethernet LAN topology. Extension wiring if the distance to the LAN connection is greater than 6 feet.

Installation

- CenturyLink will provide on-site installation of the CenturyLink Equipment, and on-site secure modem.
- CenturyLink will test TNC and/or EC with Customer.
- CenturyLink will be the initial point of contact for all orders and changes. CenturyLink will work with the Customer and Exchange to coordinate the required work and follow up with an end-to-end test.

Configuration

- CenturyLink will work with the Customer to perform testing of the network configuration to confirm Customer's receipt of the feed.

Monitoring

- CenturyLink will perform ICMP (e.g., ping) monitoring of the CenturyLink Equipment to determine system availability (24/7). In the event a component of the CenturyLink Equipment fails to respond such that data flow to Customer is interrupted or impeded, CenturyLink will notify the Customer via phone and/or email and initiate corrective action.
- CenturyLink will provide SNMP utilization statistics via a secure Web-based interface.

Upgrades

CenturyLink or the Exchange may periodically upgrade the hardware or software to maintain the latest versions in operation. If CenturyLink or the Exchange determines an upgrade is necessary, CenturyLink will work with Customer to schedule a time to make necessary changes, preferably during the normally scheduled CenturyLink maintenance window, or otherwise within five (5) business days of CenturyLink's notification of the upgrade. If Customer does not provide CenturyLink the necessary access to perform

such upgrade during the CenturyLink maintenance window or within the five (5) business day period, CenturyLink's obligation to provide the Service in accordance with this CenturyLink Service Guide and the Service Level Attachment will be suspended until Customer grants CenturyLink the access CenturyLink requires to make such upgrade. For the avoidance of doubt, CenturyLink continues to provide the Services, or a portion thereof, but the provision of such Services shall not be subject to performance with this CenturyLink Service Guide and Service Level Credits for this Service shall not apply until CenturyLink is granted the necessary access to make the upgrade and the upgrade is completed. If CenturyLink determines that an emergency security change is required, CenturyLink will make the change as soon as it deems necessary under the circumstances. CenturyLink will make commercially reasonable attempts to contact the Customer's technical contact prior to making said change but will otherwise provide notice of the required change and the anticipated timing of the change via voicemail or email contact with Customer's technical contact.

Maintenance and Support

CenturyLink connections are monitored 24 hours a day, 7 days a week. If a Customer experiences any difficulty accessing a feed, the Customer should notify CenturyLink immediately. CenturyLink will troubleshoot the issue and, if required, work with the appropriate Exchange.

- CenturyLink will work with the Customer to facilitate repair of CenturyLink hardware.
- CenturyLink will be the initial point of contact for all Service support inquiries. For Customer support inquiries please contact the FX coordinator at:

fxcoordinator@savvis.com

- For issues with an Exchange (i.e. new product, payment issues, illegal use of Exchange), the Customer should contact the Exchange directly
- In order to ensure configuration consistency and accountability for changes, all system administration and equipment passwords are managed by CenturyLink. Customer will not have access to equipment passwords or be able to make direct changes to the equipment configurations. Customer must request changes by first contacting the CenturyLink Response Center. Customer must provide complete log-in credentials to the CenturyLink Response Center when requesting changes. These log-in credentials are the same as those used to log into CenturyLink's secure Web-based interface.

Definitions

ATS: Application Transport Service is the CenturyLink product name for the physical connection (loop & port) delivered to a Customer Premise. There is a family of optional Service offerings available under Application Transport Service.

Aggregated QoS: A-QoS is a Quality of Service mechanism that allows adjacent ATS service instances to share unused bandwidth in the access channel.

Backhaul Option: Wavelengths are available for backhaul connections at bandwidths of 10 Gbit/s. Customers can take a standard backhaul circuit, which provides a connection from a cable landing station to an access point-- usually a CenturyLink node. Alternatively, customers can extend their backhaul connection to their required site, combining the backhaul and access options.

Customers requiring protection for their service also have the option of diverse routing. This option provides a very high level of protection for customer's traffic. In the event of a failure, traffic can be switched from one connection to the other quickly and easily.

BLSR: Should a fiber be cut or other network outage occur, traffic is rerouted back around the ring in milliseconds, so service continues uninterrupted. BLSR is available as two fiber or four fiber.

BLSR 2 Fiber: Both rings in the ring carry working traffic and half the capacity of each fiber is reserved for protection.

BLSR 4 Fiber: Each working fiber is assigned a protection fiber. If a working fiber is cut, it switches to the protection fiber on that span only.

BPDU: Enables switches that participate in a spanning tree protocol to gather information about each other

Business Hours: Monday to Friday 0900 to 1700 local time, excluding public holidays.

Card Protection: CenturyLink offers 1+1 card protection, which means that one working optical port is protected by another optical port on a different card.

Colocation: The provision of space at a CenturyLink Premises for the housing of Customer's equipment.

Committed Bandwidth: The level of usage that the customer commits to on a connection.

Core Network: The CenturyLink owned and operated network between CenturyLink Points of Presence (PoPs). Local access and Customer Premise equipment are specifically excluded.

Core Protection: The CenturyLink US network has a mesh design allowing traffic to be easily rerouted around a fault.

For SONET circuits of OC-3 or above, CenturyLink uses a protection mechanism called Dedicated

Transit Line (DTL) in the core to reroute the traffic. DTL is custom designed, diverse routed protection used for 155 Mbit/s and higher circuits. It uses simple static routes, meaning that the primary and protection paths are predetermined, which means that the switch over time is faster than OSRP. For circuits OC-3 and above we offer 1+1 protection.

For SONET circuits of DS3 and below, CenturyLink uses Optical Signaling & Routing Protocol (OSRP) to reroute traffic. OSRP does not determine the protection path until it is needed which makes the switch over slightly slower than DTL. CenturyLink tries to avoid delayed failover or dropped circuits wherever possible by not allowing the network to become over-utilized (50 percent is policy). For circuits DS3 and below we offer 1:n protection.

For all SONET circuits, CenturyLink uses non-revertive switching, meaning that once the failed path is restored traffic is not moved back to the original path and the protect path becomes the primary path.

CenturyLink can offer protection for 2.5 Gbit wavelength circuits; although wavelengths are normally unprotected. For our 2.5 Gbit offering, we can offer protection using Automatic Protection Switching (APS).

CenturyLink Network / Metro Network: The fiber optic telecommunication network operated by CenturyLink, including such telecommunication capacity as CenturyLink may obtain from other network providers and integrate into its own network and including any cable system.

Customer Premises: The premises designated by the Customer for the delivery of Capacity. [Chris only CenturyLink Premises is defined in our MSA/Schedules but I changed here to match the two.]

Customer Premise Equipment (CPE): The terminating device that is located at a Customer Site and terminates the Application Transport Service connection. This equipment can be defined as a router, and bridge or a switch depending on the Service options selected by the customer.

Customer Demarcation: The ATS demarcation point is service dependent. For ATS Managed service, the demarcation point is the Ethernet port on the CenturyLink CPE device. For Unmanaged service with a CenturyLink provided circuit, the demarcation point is the Ethernet port from the CenturyLink circuit monitoring device at the Customer site. For Unmanaged service, with a Customer provided circuit, the demarcation point is the Ethernet port on the CenturyLink Provider Edge equipment.

Dense Wave Division Multiplexing (DWDM): Works by combining and transmitting multiple signals simultaneously at different wavelengths on the same fiber, allowing one fiber to be transformed into multiple virtual fibers.

Etherchannel: A port trunking technology which allows grouping of several physical Ethernet links to create one logical Ethernet link for the purpose of providing fault-tolerance and high-speed links between switches, routers and servers.

Exchange: Any organization, association, or group which provides or maintains a marketplace where securities, options, futures, commodities, or other financial instruments can be bought, sold or traded.

LACP: Allows for the bundling of several physical ports together to form a single logical channel.

Leased Capacity or Capacity: Any portion of the capacity specified as such in the applicable Service Order.

Local Access Facilities: The domestic facilities and related equipment required to connect the CenturyLink network to the Customer's Premises. Local Access Facility termination points are located at the Customer's premise.

Local Access (Local Loop): A physical circuit, that connects from the demarcation point of the Customer Premises to the edge of a service provider's network.

Maximum Transmission Unit (MTU): The largest size packet or frame that can be sent in a packet-based network, usually refers to Ethernet packet size.

Meet Me Room: A central location within a collocation center or carrier hotel where multiple carriers and/or customers can interconnect with each other via a cross connect.

METRO Ethernet Virtual Private Line (EVPL): A Layer 2 point-to-point connection between two fixed points within a CenturyLink Metro Network.

MPLS Network: The CenturyLink owned and operated network between CenturyLink Points of Presence (PoPs). Local access and Customer Premise equipment are specifically excluded.

Network Termination Point: The telecommunication network interface at the Customer's Premises, as provided by the local exchange carrier, if CenturyLink orders the local loop on behalf of the customer.

On-net: Refers to the Services or any part of them supplied over infrastructure owned or controlled by CenturyLink or its Affiliates.

Off-net: Refers to the Services or any part of them supplied over a third party's local loop.

Point-of-presence (Pop): A direct point of entry and departure on the CenturyLink network. Pops provide the infrastructure to enable the Customer to connect to the CenturyLink network.

Protection in the Access Circuit: Most local loop providers offer a protection mechanism called Bi-Directional Line Switching Ring (BLSR) although Uni-Directional Path Switched Ring (UPSR) is often used instead.

Provider Edge (PE): Provider Edge is a router or switch on the CenturyLink network on which a customer's connection terminates.

Public IP: An option of the Application Transport Service (ATS) that delivers internet access service.

Spanning Tree Protocol (STP): A link management protocol that provides path redundancy while preventing undesirable loops in the network.

Uniform QoS: The standard within ATS for marking and treatment of packets at Layer 3 based on Differentiated Services or DiffServ Code Points (DSCP) in the access channel and Exp Bits on the backbone.

VLAN or logical connection: Refer to the Layer 2 separation utilized on the Application Transport Service to separate various traffic types (e.g., Public and Private traffic).

WAN Ethernet Virtual Private Line (EVPL): Layer 2 point-to-point connection between two fixed points across the CenturyLink Core Network.

Wavelength Access Option: Wavelengths are available for access connections at bandwidths of 2.5 Gbit/s or 10 Gbit/s. CenturyLink can connect customers to a CenturyLink node from their own site or from a carrier hotel facility.

The configurations and service details of wavelength-based access services will vary, depending on whether customers require a connection to their site or a carrier hotel, and according to the local infrastructure. CenturyLink can provide the access connection (with the terminating equipment provided by the customer).

There are some distance limitations for access services where CenturyLink provides only the fiber-optic access connection and not the terminating equipment:

- 2.5 Gbit/s access connections - maximum distance of 10 kilometers between the customer site or carrier hotel and the CenturyLink node.
- 10 Gbit/s access connections - maximum distance of 3 kilometers between the customer site or carrier hotel and the CenturyLink node.

Wavelength Connectivity: Wavelength connectivity is enabled by the use of Dense Wave Division Multiplexing (DWDM), a technology that allows a single fiber to perform as multiple 'virtual fibers.' The customer is allocated a wavelength (Lambda on our DWDM links), allowing the customer to transparently pass their SONET overheads through the CenturyLink network. Wavelength circuits provide customers with scalable network capability, without the expensive creation of fiber and at a quicker time to market.

CenturyLink supports a 2.5 Gbit/s framed service and a 10 Gbit/s transparent service (US).