

FIX Network Connectivity

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1 Introduction

1.1 Purpose

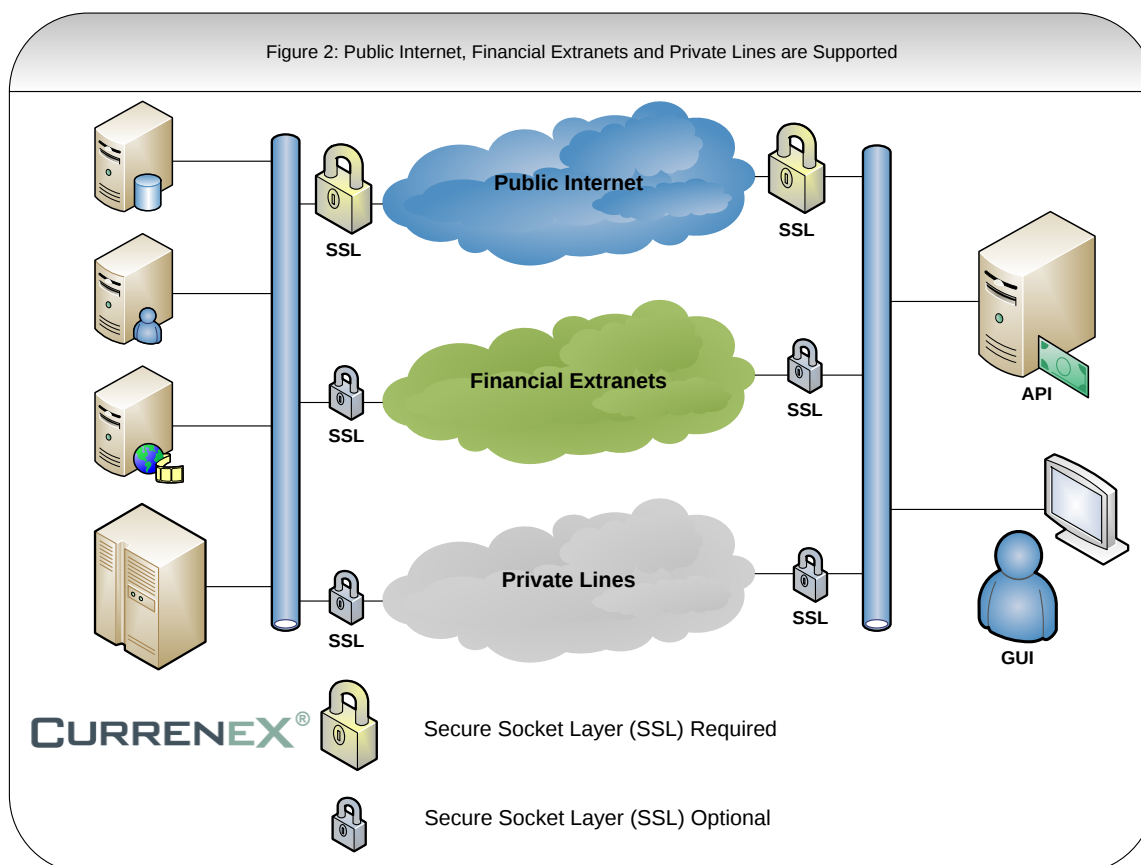
The purpose of this document is to describe the network connectivity methods via which users can connect to the Currenex FIX service.

2 Connectivity

Currenex offers multiple connectivity options based on customer usage profiles. Connections via the Public Internet and Extranets are sufficient for most customers. Lower latency options including Direct X-Connect and Proximity Hosting are available.

Currenex must approve connectivity through all network vendors prior to circuits being ordered. The use of SSL is optional for connections established over private networks or Extranets.

Available Network Connection Options for Currenex FIX Users



- **Public Internet**

Clients can connect to the Currenex FIX Gateway over the Public Internet. A Secure Socket Layer (SSL) channel must be used to ensure privacy, security and data integrity. The Currenex server certificates are signed by established Certificate Authorities and are available online for verification. Currenex maintains large connections via diverse local access carriers to several major backbone providers to ensure high performance and high availability.

- **Extranets**

Extranets provide Currenex customers a cost effective and highly reliable connectivity mechanism. Extranet providers have established redundant connectivity into the Currenex datacenters. Throughput, routing, latency, security and failover is closely monitored and tested regularly. Extranets are able to install on-net services quickly due to pre-provisioned connections. Currenex supports the following extranet providers: Radianz, IPC and Yipes.

- **Private Networks (Direct Line Cross Connections)**

Currenex supports private network connectivity. Clients are required to order two private lines or Ethernet

private lines from two (2) different client locations to two (2) Currenex Points of Presence (POP). Ethernet Private Line service (EPLM) is the preferred connectivity type for this service. Typical setup time for this is two (2) to three (3) weeks.

- **Proximity Hosting**

Currenex supports Proximity Hosting, in which a client's trading servers occupy the same physical space as the Currenex data center. As a result, latency is reduced due to the client's trading applications being closer to the Currenex sources of market data. Typical setup time for this is two (2) to four (4) weeks.

2.1 Connectivity Standards for Currenex FIX Users

The following table provides a summary of the connectivity options available to Currenex FIX users accessing the Institutional (PROD) and GovEx platforms.

If a client's typical usage is 8Mbps or less, then Internet or Extranet is recommended.

For clients using 10Mbps or more, then Cross-Connection or Proximity Hosting is recommended.

	Internet	Extranet	Direct Cross-Connect	Proximity Hosting
Typical Client Profile	GUI	GUI & API Market Making	High Velocity Trading	High Velocity Trading
Approved Vendors	Any	Radianz SFTI Reliance Globalcom Atrium	Equinix Currenex (termination)	Equinix Hosting Vendors
Service Resiliency	Multi-Homed Providers	Redundant	Duplicate Cross-Connect	Duplicate Cross-Connect
Workflow Process	Client requests from Currenex	Client orders from Radianz	Client requests LOA/CFA from Currenex	Client acquires co-location and requests LOA/CFA from Currenex

2.2 Cross-Connect (X-Connect) Network Point of Presence (PoP)

Currenex operates four (4) network Points of Presence (POP locations: Tokyo (KVH TK1), London (Equinix LD4), New York (Equinix NY4), Chicago (Equinix CH1). Currenex only supports Cross-Connects (X-Connects) using Gigabit Ethernet service through Single-Mode fiber in existing Points of Presence (POP). No other media or service is currently supported.



Diagram 1: Currenex Point of Presence (PoP) Map

2.3 High Velocity Trading Service Resiliency

The diagrams below provide examples of trading service resiliency with the use of multiple cross-connects.

Diagram 2 shows a single cross-connect in two (2) Points of Presence (POP). In this example, when connectivity failover occurs a backup connection will run via a remote secondary link (POP2) which will increase latency due to the backup being in a remote site.

Diagram 3 shows a lower latency solution by deploying a second cross-connect at the same Point of Presence (POP) as the primary site, thereby eliminating the need for the backup connection to run via a remote secondary site.

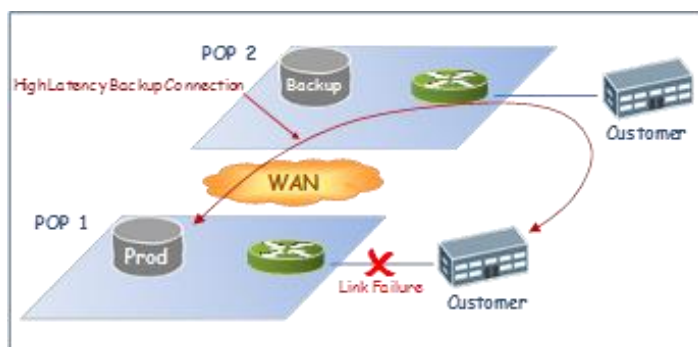


Diagram 2: High Latency Resilient Connectivity

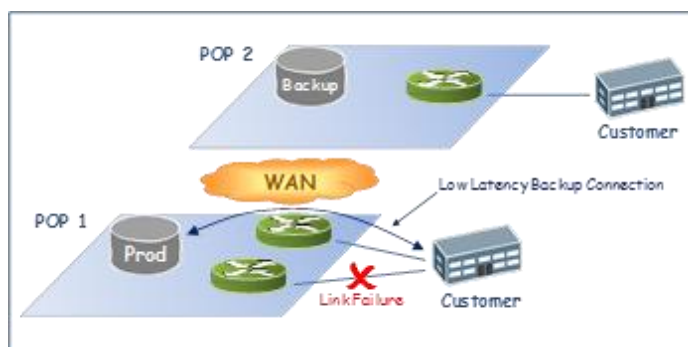


Diagram 3: Low Latency Resilient Solution

3 SSL Encryption

3.1 Secure Sockets Layer (SSL) Tunnelling

Secure Sockets Layer (SSL) is required when the public Internet is used to access the FIX Gateway. Its use is optional for users connecting across private networks (Radianz). For Proximity Hosting and X-Connect it is not applicable. Any SSL implementation that supports TLS v1.2 with mutual authentication can be used.

If SSL support is not available in a MP's FIX implementation, Currenex recommends Stunnel, an open-source implementation used widely as an SSL proxy tool. Refer to <http://www.stunnel.org> for more information.

Currenex issues digital certificates for its integration and production environments. Initial connectivity and testing can be performed without SSL, but prior to going live, SSL connectivity must be tested.