

OTC Markets

Connectivity Manual

Version 6.0

October 2013

Contents

1.0 Introduction	3
1.1 General Connectivity Details.....	3
1.2 OTC Markets Products	3
1.3 Methods of Connectivity:.....	3
1.4 Terminology	3
1.5 Contact Information.....	4
2.0 Connectivity Details	5
2.1 Connectivity Requirements.....	5
2.2 Connectivity Recommendations	5
2.3 Responsibilities/Service Procedures	5
3.0 Costs/Fees	7
3.1 Connectivity Costs.....	7
3.2 Port costs	7
3.2 Access Fees	7
4.0 Bandwidth Requirements	8
4.1 Multicast Market Data Bandwidth.....	8
4.2 FIX Bandwidth	8
4.2.1 FIX Drop Copies and Trade Message Entry	8
4.2.2 FIX Quoting.....	8
4.3 OTC Dealer Client Bandwidth.....	8
5.0 Service Providers.....	9
5.1 Extranets	9
5.2 OTC Markets Housed Metro-Ethernet Carriers	9
5.3 Primary Datacenter Housed Service Providers	9
5.4 Secondary Datacenter Housed Service Providers.....	10
6.0 Contact Information.....	11
6.1 Extranet Contacts.....	11
6.2 Datacenter Contacts	11
6.3 OTC Technical and Sales Contacts.....	11

1.0 Introduction

1.1 General Connectivity Details

- OTC Markets infrastructure exists in 2 datacenters in an Active/Passive setup for unicast traffic, an Active/Active setup for Multicast traffic, and an Active/Active setup for network availability.
- Our primary datacenter is located at SunGard Availability Services 777 Central Blvd, Carlstadt, NJ 07072. Our Secondary Datacenter is located at SunGard Availability Services 401 N. Broad Street, Philadelphia, PA 19108.
- We recommend customer connectivity to both locations for the production retrieval of Multicast Market Data and for FIX redundancy.
- **Customers must contact us prior to ordering any circuits into our datacenter. Ordering circuits without proper notification to us will delay the installation process.**

1.2 OTC Markets Products

- FIX Quote, Trade Message Entry and Drop Copy
- OTC Dealer Client
- Multicast Market Data

1.3 Methods of Connectivity:

1. Extranets – BT Radianz, Savvis COIN, SFTI and TNS
2. SunGard Cross-connect – For customers located within a SunGard facility
3. Metro-Ethernet circuits – Point-to-point, direct, or private circuits

1.4 Terminology

- OTCM – OTC Markets Group
- MMR – Meet-Me Room
- MRC – Monthly Recurring Cost
- NRC – Non-Recurring Cost
- LOA – Letter of Authorization
- Cross-Connect – The final extension of datacenter cabling to OTCM equipment.

1.5 Contact Information

- General Technical Support Line: 212-896-4411
- Customer Connectivity Email: customerconnectivity@otcmarkets.com

2.0 Connectivity Details

- OTCM offers an Inter-Data Center connectivity (backhaul) connectivity option to our direct connect subscribers.
 - The backhaul option enables direct connect subscribers to utilize their backup circuit in DR (if applicable) to target our primary active site in Carlstadt for FIX and Dealer services in the event of a primary circuit failure.
 - The backhaul option also allows direct connect subscriber to receive both A and B Market Data feeds from a single datacenter.

2.1 Connectivity Requirements

- We accept CAT5e/6, Single-mode, and Multi-mode Ethernet handoffs directly into our equipment.
- Serial and WDM circuits are not accepted.
- No media converters are permitted in the OTCM environment.
- Port speed configurations can only be 100Mb/Full Duplex or 1Gb/s Full Duplex.
- Metro-Ethernet circuits **cannot** be configured at half duplex, 10Mb/s, or auto-negotiation.
- Customer is expected to have equipment at their end of the circuit to handle potential microbursts of traffic.

2.2 Connectivity Recommendations

- OTCM recommends that customers have diverse carrier connectivity to the Primary and Secondary OTCM Datacenters.
- OTCM recommends that customers order enough bandwidth to handle microbursts in traffic where possible. (See Section 4.0)

2.3 Responsibilities/Service Procedures

- OTCM does not permit customer equipment within our datacenter cabinet space. For close proximity to our equipment please contact our SunGard Datacenter Sales Representative, Eugene Connett at (203) 750-8110 or Eugene.connet@sungard.com.
- OTCM is responsible up until the handoff which is defined as the location of the circuit delivered by the carrier.
- OTCM is not responsible for and does not monitor customers' circuits.

OTC Markets Group
Connectivity Manual (Version 6.0)

- Aside from resolution of critical issues, OTCM will perform all maintenance activities between the hours of 5PM and 8AM EST weekdays or on weekends or holidays.
- OTCM will process orders for any circuits or cross-connects into our cabinet space from the MMR.
- Customers located within SunGard Infrastructure are required to order the cross-connect into our cabinet space.
- OTCM will charge back any extraneous costs related to circuit delivery to the customer in addition to those listed in the Costs/Fees section below.

3.0 Costs/Fees

3.1 Connectivity Costs

- Initial Connectivity Fee: \$1,500 NRC
 - Includes primary and secondary connections to our environment. Only if both circuits/extensions are ordered within 1 month of each other. Includes the issuing of a LOA to the service provider to gain access to our datacenter space.
 - Includes the extension of the circuit from the Demarcation point to OTC equipment.
 - Subject to adjustment depending on other expenses OTC may incur from the datacenter provider
- Unique connectivity scenarios will be reviewed on a case by case basis.

3.2 Port costs

There is a \$500 MRC port fee per connection. Some connectivity options may incur a one-time port setup fee.

- RJ45 Handoff connection to our switch
 - RJ45 must be CAT5e UTP or CAT6 UTP.
 - No one-time cost.
- LC Fiber Handoff (Multimode)
 - There is an additional one-time cost of \$500 per connection
- LC Fiber Handoff (Singlemode)
 - There is an additional one-time cost of \$1,000 per connection

3.2 Access Fees

All customers who connect directly or via an extranet provider to OTC Markets' Multicast Data Feeds will be assessed a \$1000 per month Access Fee charge. The charge is per firm per month. Customers who connect directly will be invoiced by OTC Markets while customers who connect via an extranet will be invoiced by the respective extranet provider. There is no access fee for Quote/Message entry, Drop Copies or OTC Dealer connectivity.

Inter-Data Center Connectivity (Back-haul): \$500 per site per month

4.0 Bandwidth Requirements

4.1 Multicast Market Data Bandwidth

See: <http://www.otcmarkets.com/services/market-data/realtime-data/specifications>

4.2 FIX Bandwidth

4.2.1 FIX Drop Copies and Trade Message Entry

For Drop Copies (Execution Reports) and Message Entry, bandwidth is typically under 1Mb. However, if you will be sending a large number of trade messages or receiving a high number of Drop Copies, please size your bandwidth accordingly.

4.2.2 FIX Quoting

For FIX Quoting please use the chart below to estimate your necessary bandwidth. OTCM recommends customers allow at least 1Mb overhead for potential bursts in traffic.

Average Message Size (Bytes)	235
------------------------------	-----

Quote Message Rate (Msg/Sec)	100	200	400	800
Approximate Bandwidth Needed (Mb/s)	0.188	0.376	0.752	1.504

Calculation for Bandwidth Requirements (Mb/s):

Expected Message Size x Expected Quote Message Rate x 8 / 1000000

4.3 OTC Dealer Client Bandwidth

For OTC Dealer Bandwidth please provide us with a list of users who will be using dealer and the securities they each will be quoting. This can be emailed to customerconnectivity@otcmarkets.com.

5.0 Service Providers

5.1 Extranets

- BT MPLS
 - Currently available with connectivity to OTCM Primary and Secondary Sites.
- Savvis COIN
 - Currently available with connectivity to OTCM Primary and Secondary Sites.
- TNS
 - Currently available with connectivity to OTCM Primary and Secondary Sites.
- SFTI
 - Connectivity to both the Primary and Secondary Sites.

5.2 OTC Markets Housed Metro-Ethernet Carriers

- Reliance Globalcom – Located directly in OTC cabinet space in the Primary and Secondary Datacenter.

5.3 Primary Datacenter Housed Service Providers

Carlstadt 777 Central Blvd (NJ)

<u>Service Providers</u>	<u>Services</u>
4 Connections	Optical/Ethernet - fiber
Abovenet	Ethernet - fiber
AT&T Local Services	DS1/DS3/Optical/Ethernet - fiber
Fibertech	Dark Fiber
Level 3	DS3/Optical/Ethernet - fiber
Optimum Lightpath	Optical/Ethernet - fiber
Sidera Networks / RCN	Optical/Ethernet - fiber
Time Warner	DS1/Optical/Ethernet - fiber
Verizon	POTS/DS1/DS3/Optical/Ethernet – Copper/Fiber
Verizon Business (Legacy MCI)	DS1/DS3/Optical/Ethernet – Copper/Fiber

5.4 Secondary Datacenter Housed Service Providers

Philadelphia 401 N Broad St. (PA)

<u>Service Providers</u>	<u>Services</u>
Abovenet	Optical/Ethernet - Fiber
AT&T Local Services	DS1/DS3/Optical/Ethernet - Fiber
Cogent	Optical/Ethernet – Copper
Cross Connect Solutions	Optical/Ethernet - Fiber
Global Crossing	Optical/Ethernet - Fiber
Level 3	DS3/Optical/Ethernet - Fiber
Level 3 (Broadwing)	DS3/Optical/Ethernet - Fiber
Level 3 (Telcove)	Optical/Ethernet – Copper/Fiber
Level 3 (Wiltel)	DS3/Optical/Ethernet - Fiber
Qwest	DS3/Optical/Ethernet – Fiber
Qwest (OnFiber)	Optical/Ethernet – Fiber
RCN (Neon)	Optical/Ethernet - Fiber
Sprint	DS1/DS3/Optical/Ethernet – Fiber
Sunesys	Optical/Ethernet - Fiber
Verizon	POTS/DS1/DS3/Optical/Ethernet – Copper/Fiber
Verizon Business (Legacy MCI)	DS1/DS3/Optical/Ethernet – Copper/Fiber

6.0 Contact Information

6.1 Extranet Contacts

Extranet sales contact information may be found at: <http://www.otcmarkets.com/traders-brokers/realtime-data/connection>

6.2 Datacenter Contacts

- SunGard Availability Services
 - Sales: Eugene Connett – (203) 750-8110 – Eugene.connet@sungard.com

6.3 OTC Technical and Sales Contacts

- Sales Inquiries
 - marketdata@otcmarkets.com
- Technical Support
 - techsupport@otcmarkets.com
 - (212) 896-4411
- Customer Connectivity
 - customerconnectivity@otcmarkets.com