



# Network Connection Specifications

**Version :** 1.08

**Date :** April 17, 2003

# Table of Contents

|  |    |
|--|----|
| Table of Contents .....  | 2  |
| 1. Overview .....  | 3  |
| 1.1 Available Environments .....   | 3  |
| 2. Connectivity .....  | 3  |
| 2.1 Test Access .....  | 3  |
| 2.2 Production Access .....  | 4  |
| 2.2.1 Direct Connect.....  | 4  |
| 2.2.1.1 Network Connectivity.....  | 4  |
| 2.2.1.2 Redundancy .....   | 4  |
| 2.2.2 Third Part Networks .....  | 5  |
| 2.3 Bandwidth Requirements .....   | 5  |
| 2.4 WAN IP Addressing .....  | 5  |
| 2.5 Host IP Addressing .....   | 5  |
| 2.6 IP Routing.....  | 5  |
| 2.7 Network Security.....  | 5  |
| Appendix 1. ....   | 7  |
| 1. BOX Point of Presence Sites .....   | 7  |
| 1.1 New York Site .....  | 7  |
| 1.2 Chicago Site.....  | 7  |
| 1.3 San Francisco Site .....   | 7  |
| Appendix 2 .....   | 8  |
| 1. Connection Details .....  | 8  |
| 1.1 VPN Connections .....  | 8  |
| 1.2 ISDN Connections.....  | 9  |
| 1.3 PPP Dialup .....   | 9  |
| 1.4 Production Connections.....  | 10 |
| Figure 1 : Typical VPN Connection .....                                      | 9  |
| Figure 2. Typical ISDN Connection.....                                       | 9  |
| Figure 3. Typical PPP Dialup Connection.....                                 | 10 |
| Figure 4. Typical production connection at BOX Point of Presence Sites ..... | 10 |

## Disclaimer

The information included in this document is believed to be accurate. The Boston Options Exchange (BOX) does not guarantee the completeness or accuracy of any information herein included. This document was produced with the understanding that BOX is providing information and not in any way providing engineering or other professional services.

## 1. Overview

This document outlines the specifications for connecting to the BOX trading networks. The applications available through the BOX networks include, but are not limited to:

| Service name | Description  |
|--------------|--|
| MMTP/SLE     | The native gateway for order and quote entry on BOX.   |
| FIX          | The FIX gateway for order entry on BOX.  |
| BOX-HSVF     | BOX High Speed Vendor Feed: the outbound market data feed.   |
| BOX-ATR      | BOX Automated Trade Reporting feed providing participants with “drop-copies” of all their trades on BOX. |

### 1.1 Available Environments

Clients can obtain access to the BOX test and production environments through separate production and test networks. Clients will need to connect to one or both depending on their needs.

## 2. Connectivity

### 2.1 Test Access

The BOX test environment is located on a test network separate from the production network. Access to the BOX test environment can be obtained using the following connectivity options:

- VPN access through the Internet is available.
- ISDN 64k on demand. ISDN service is only available to our Montreal location. Clients are assigned a single ISDN channel. The client will initiate the connection and will be responsible for any long distances charges.
- PPP modem dialup. Dialup service is only available to our Montreal location. Clients will be assigned a username and password and static IP address. The client will initiate the connection and will be responsible for any long distance charges.

- Third party networks. The test environment is also accessible via the Savvis and Radianz networks. Please clearly specify that access to the BOX Test Environment is being requested.

## **2.2 Production Access**

To obtain access to the BOX production environment, clients must connect to the BOX production network. Access to the production network can be obtained by one of the following methods. VPN connections will not be accepted to the production network. Access to the test environment is not available via the BOX production network.

### **2.2.1 Direct Connect**

A direct connection can be made to one or more of the BOX Points of Presence (POPs). A list of the POPs is available in Appendix 1.

#### **2.2.1.1 Network Connectivity**

Physical connectivity to the BOX production network is provided by a 10Mb Ethernet connection. The connection will be full duplex unless the client equipment cannot support this setting. In that case half duplex will be provided.

#### **2.2.1.2 Redundancy**

If the client wishes, BOX will accept multiple client connections for redundancy. At each location, BOX has redundant equipment and can therefore provide diverse connections to the BOX production network. For added redundancy, a client may also wish to install their redundant links to different POPs.

## 2.2.2 Third Party Networks

For a complete list of third party network providers offering connectivity to BOX, please visit our website at [www.bostonoptions.com/conn-tel.php](http://www.bostonoptions.com/conn-tel.php).

## 2.3 Bandwidth Requirements (at BOX launch date)

Bandwidth requirements are determined by the type of traffic the client requires:

| Type of Traffic  | Bandwidth required |
|--|--------------------|
| Simple order routing   | 128kbps            |
| HSVF Market Feed - Best Limit (including order routing)                      | 2.5mbps            |
| HSVF Market Feed - Five Best Limits (including best limit and order routing) | 4mbps              |
| NBBO*  | 1.5mbps            |

\* The requirements for the NBBO are in ADDITION to the bandwidth indicated for the other traffic types.

For testing, 64kbps is sufficient.

## 2.4 WAN IP Addressing

The IP network addresses assigned to the Ethernet links connecting the client equipment to the BOX trading network will be assigned by BOX unless the clients wish to supply their own addresses.

## 2.5 Host IP Addressing

The client must provide the IP addresses of its hosts that will connect to the BOX applications. If possible, the clients should supply public IP addresses assigned to them by the IANA. If public IP addresses are not available to the client, then the client may choose to use private (non-routable) addresses from the reserved IP address ranges as outlined in RFC1597 on the condition that the addresses do not conflict with any addresses currently used on the BOX networks.

## 2.6 IP Routing

Typically, IP routing will be done using static routes. In cases where dynamic routing is required, BGP will be used.

## 2.7 Network Security

The BOX trading networks and hosts are protected by the use of packet filtering and firewalls. The security measures in place are meant to protect the BOX trading networks and hosts from intentional or accidental access from client connections. These measures are in no way intended to provide security to the clients themselves. If clients feel they require additional security for their networks, they are encouraged to put in place the necessary security measures they feel appropriate.

# Appendix 1.

## 1. BOX Point of Presence Sites

There are several sites available in order to connect to the BOX production network. No test connections will be accepted to these sites.

### 1.1 New York Site

The New York site is located at:

*Boston Options Exchange  
c/o Switch & Data  
65 Broadway  
3rd Floor  
New York, NY  
10006  
NPA-NXX: 212-430*

### 1.2 Chicago Site

The Chicago site is located at:

*Boston Options Exchange  
c/o Level 3 Communications  
111 North Canal Street  
2nd Floor  
Chicago, Il  
60606  
NPA-NXX: 312-895*

### 1.3 San Francisco Site

The San Francisco site is located at :

*Boston Options Exchange  
c/o Level 3 Communications  
185 Berry St.  
2<sup>nd</sup> Floor  
San Francisco, CA  
94107  
NPA-NXX: 415-808*

## Appendix 2

### 1. Connection Details

This section describes the connection details for both the test and production networks.

#### 1.1 VPN Connections

VPN access is available to the BOX test environment only. Typically VPN connections are setup in tunnel mode between the client's VPN device and the BOX VPN routers. Over the VPN, traffic will then be routed between the clients internal hosts and the BOX test hosts. In order to initiate a VPN, the client must have a fixed Internet reachable IP address in order to be able to pass through our firewalls. For VPN connections, the following ISAKMP policies are accepted:

Policy 1:

|                       |                      |
|-----------------------|----------------------|
| encryption:           | 3DES                 |
| hash:                 | Secure Hash Standard |
| authentication:       | Pre-shared key       |
| Diffie-Hellman group: | #2 (1024 bit)        |
| lifetime:             | 7200 seconds         |

Policy 2:

|                       |                |
|-----------------------|----------------|
| encryption:           | DES            |
| hash:                 | MD5            |
| authentication:       | Pre-shared key |
| Diffie-Hellman group: | #1 (768 bit)   |
| lifetime:             | 7200 seconds   |

For VPN connections, the following IPSEC transform sets are accepted:

- esp-3des esp-sha-hmac
- esp-des esp-md5-hmac

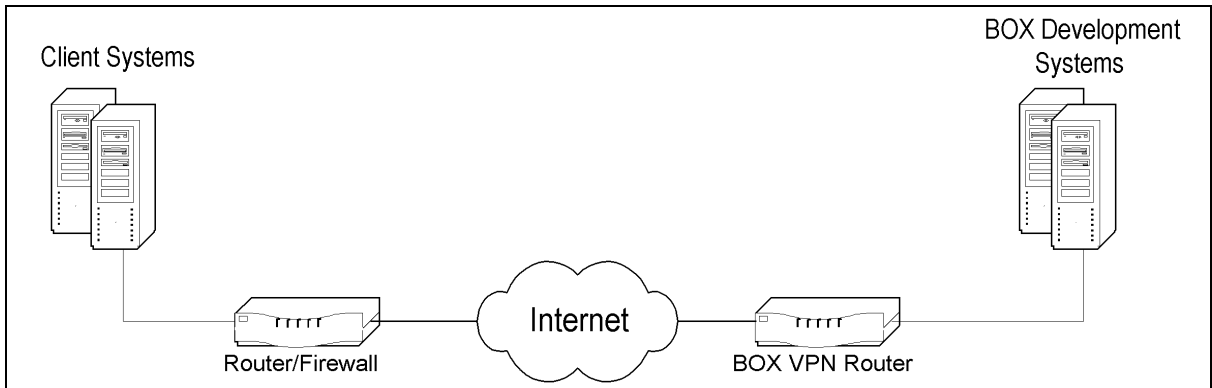


Figure 1. Typical VPN Connection

## 1.2 ISDN Connections

Typically ISDN connections are setup between the client's router and one of the BOX routers. ISDN connections may be used for accessing the BOX test environment and as backup links when connecting to the BOX production environment. It is strongly recommended that ISDN lines not be used for primary production access. ISDN connections are always initiated by the client.

For the BOX test environment, BOX will provide a 64k ISDN channel for access. These 64k channels are only available to our Montreal location. The client will be responsible for the ISDN line at his end and any toll charges which may apply. For the BOX production environment the client is responsible for supplying the ISDN line at his end as well as the ISDN line at one of the BOX POPs. The client is also responsible for providing the router and necessary ISDN termination equipment (NT-1).

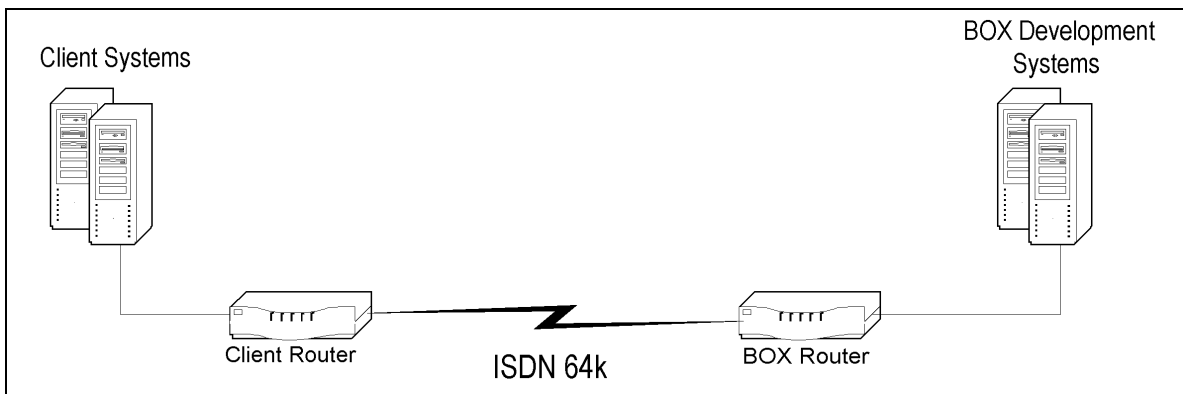


Figure 2. Typical ISDN Connection

## 1.3 PPP Dialup

PPP connections are available via modem dialup to our Montreal location and are only used for accessing the test environment. The client will be given a username and password and assigned an IP address. PPP connections are always initiated by the client. Any toll charges that may apply are the responsibility of the client. The client is responsible for configuring the appropriate PPP client software on their computer. Due to the number of

various PPP implementations available, no support can be given to clients requiring help setting up a PPP connection.

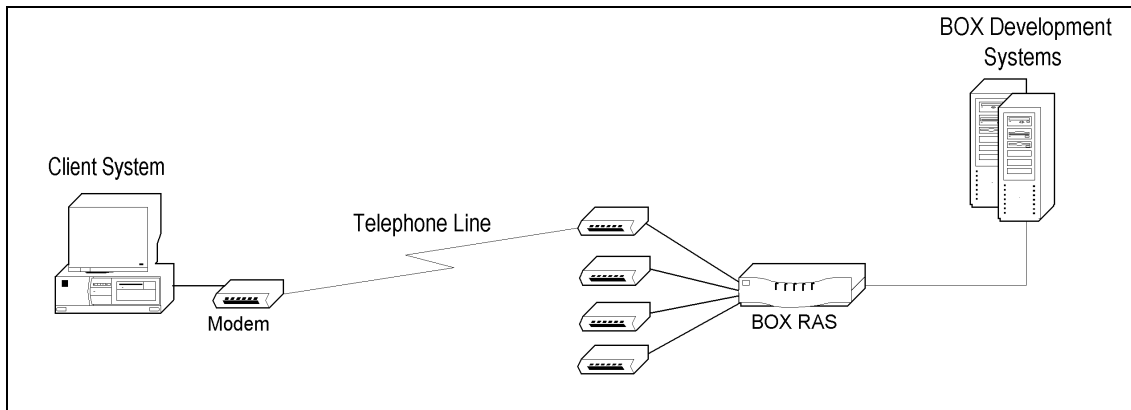


Figure 3. Typical PPP Dialup Connection

## 1.4 Production Connections

For production connections the client is responsible for ordering the appropriate telecommunications lines and equipment (typically routers). For each connection, 4RU of cabinet space will be provided in the BOX data cabinets in which to fit the client equipment. Equipment needs to be rack mountable in a standard 19" cabinet.

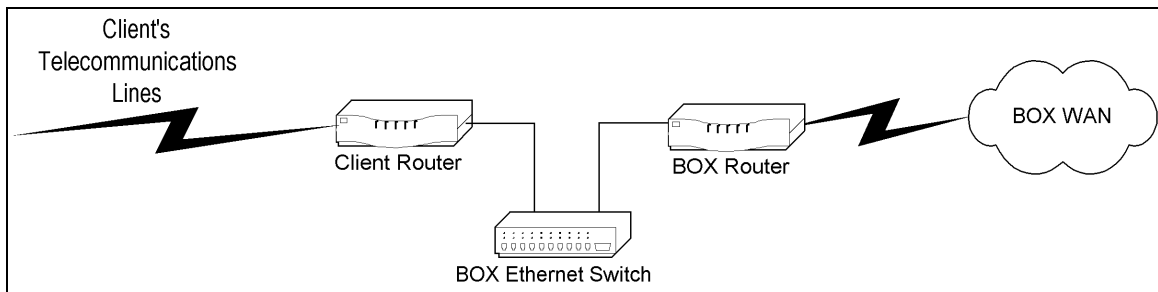


Figure 4. Typical production connection at BOX Point of Presence Sites.