



Technical Connectivity Guide

for

Global Clearing Link Participants

Version 2.9

©2004 The Clearing Corporation. All Rights Reserved.

All intellectual property, proprietary and other rights and interests in this publication and the subject matter hereof are owned by The Clearing Corporation including, without limitation, all patent, registered design, copyright, trademark and service mark rights. While reasonable care has been taken in the preparation of this publication to provide details that are accurate and not misleading at the time of publication, The Clearing Corporation and its respective servants and agents (a) do not make any representations or warranties regarding the information contained herein, whether express or implied, including without limitation any implied warranty of merchantability or fitness for a particular purpose or any warranty with respect to the accuracy, correctness, quality, completeness or timeliness of such information, and (b) shall not be responsible or liable for any third party's use of any information contained herein under any circumstances, or for any errors or omissions continued in this publication.

Abstract

This document describes the connection alternatives available to Clearing Corporation and Eurex Clearing AG members to connect to The Clearing Corporation (CCorp) from European cities.

Key Words

Global Clearing Link, Eurex Clearing AG (ECAG), The Clearing Corporation (CCorp), Eurex US, Eurex, Deutsche Börse Systems (DBS), Corente, Radianz.

TABLE OF CONTENTS

1	Introduction	3
2	Clearing Corporation Data	3
2.1	Graphical User Interface (GUI)	3
2.2	MQ Series	4
2.3	File Transfer Protocol (FTP)	4
3	Clearing Corporation Network Options	4
3.1	Network Structure	5
3.2	IP VPN Connections	6
3.3	Private IP Connections	7
3.3.1	Private Line Solution – DBS	8
3.3.2	Private Line Solution – Radianz	8
4	Support	10
4.1	Public Internet connections	10
4.2	Installations, changes, and disconnections	10
4.3	Network problem diagnosis and troubleshooting	10
4.4	Application problem diagnosis and troubleshooting	10
5	Pricing	11
5.1	Terms	11
5.1.1	DBS Disconnect Terms	11
5.1.2	Radianz Disconnect Terms	11
5.2	Internet IP VPN Pricing	11
5.3	Private Network Pricing	12
5.3.1	DBS Network	12
5.3.2	Radianz Network	13
5.3.3	Alternatives	13
6	Order and Disconnect Process	14

1 Introduction

All participants that clear through The Clearing Corporation (CCorp) and those that trade US dollar-denominated products cleared through Eurex Clearing AG, Frankfurt, (ECAG) must have a network connection with CCorp. This document describes the ways in which participants in the Global Clearing Link between CCorp and ECAG can establish a technical connection to the CCorp systems.

To make an informed network choice, participants must first understand the various data components transmitted between CCorp and clearing participants. Data types will be outlined and network alternatives will be presented.

Clearing participants must have a minimum of 64kbps bandwidth dedicated to CCorp. CCorp offers European participants a choice of connectivity options for machine-to-machine communication:

- Internet VPN solution using Corente software
- Private line solution from Deutsche Börse Systems AG, Frankfurt, (DBS)
- Private line solution from Radianz

Only one connection per clearing participant is required; any of the three (3) aforementioned methods is acceptable. The Clearing Corporation believes that the connectivity alternatives described here will deliver superior performance while allowing customers to leverage existing network investments, schedule network migrations to meet their own priorities, and meet diverse service level and price objectives.

2 Clearing Corporation Data

CCorp supports three types of data traffic: GUI, MQ, and FTP. Each transport has its own technical characteristics and is best suited for a particular type of business transaction. All CCorp data utilize Internet Protocol (IP) transport.

2.1 Graphical User Interface (GUI)

All of the CCorp user interfaces are web-based GUIs. The Allocation and Claims Transactions (ACT®)¹, New Trade Management (NTM), and Give-up Accounting (GAINS®)² systems are browser-based.

GUI traffic is more bandwidth-intensive than other CCorp data traffic, and is secured with encryption provided on a commercially available browser. These applications are best accessed over a connection that is a minimum of 512 kbps.

Due to the bandwidth-intensive nature of the GUI applications and the high cost of leased lines, CCorp strongly recommends that GUI access traverse the public Internet. CCorp user interfaces can be accessed via any commercially available web-browser that supports 128-bit encryption. Most CCorp customers access these applications over the Internet and are comfortable with browser-based encryption for security. If additional security is desired, the Corente VPN solution scales to any bandwidth and will provide enhanced security to the browser.

Customers who require only GUI application access (no MQ or FTP) can communicate with CCorp via a web-browser and the public Internet, without any additional software, hardware, or network connection.

¹ ACT® is a registered trademark of The Clearing Corporation

² GAINS® is a registered trademark of The Clearing Corporation and the Chicago Mercantile Exchange

2.2 MQ Series

All trade and post-trade management transaction interfaces are supported through IBM's MQ Series messaging software. These interfaces include:

- Back-office system trade feeds
- Give-up/take-up actions
- Trade notification
- Position management

MQ Series is a futures industry standard because it is highly efficient and guarantees message delivery. When a message has been transmitted, MQ software on the receiving machine acknowledges receipt and the sending machine goes to the next transaction. If the receiving machine is unavailable, MQ software on the transmitting machine holds the message until that machine becomes available.

A standard CCorp message is 1500 kilobytes. One message is required for each transaction. A secured connection of at least 64 kbps, which can also be shared with FTP communication, is recommended for MQ Series traffic.

Clearing participants transferring data through MQ are responsible for acquiring and installing MQ software on their systems.

2.3 File Transfer Protocol (FTP)

All file transmission interfaces are FTP-based. FTPs sessions are initiated by the participant's back-office systems, which "PUT" files to and "GET" files from a dedicated CCorp FTP server. The bulk of this data is transmitted after trading hours. FTP software is standard on all operating systems that support Internet protocol.

Participant files to be downloaded from CCorp vary in size from 4 kilobytes to 4 megabytes, depending on file type and trading activity. Larger files are transmitted after completion of end-of-day processing. A single secured 64 kbps connection may be used for MQ Series and FTP traffic.

3 Clearing Corporation Network Options

CCorp offers several connectivity alternatives for clearing participants. Those alternatives are:

- Public Internet via VPN software from Corente
- Private line hosted by DBS
- Private line hosted by Radianz

These options were developed to enable participants to make network decisions based on cost/benefit to their organizations. If it becomes apparent that the solution set needs to be expanded, CCorp will add choices.

Transport for all CCorp traffic is the Internet Protocol (IP). The optimal connectivity choice depends on data type, transaction volume, and customer policy. A secure connection to each clearing participant can be facilitated via the Internet or private line.

MQ and FTP traffic can be transported via an Internet Virtual Private Network (VPN) or private line. Alternatives for MQ and FTP traffic include a hosted and monitored Internet VPN solution, the Deutsche Börse Systems AG, Frankfurt (DBS) private network, and the Radianz Financial Industry Network. The Internet VPN is the least expensive option and can provide the highest bandwidth. Private line alternatives provide more consistent performance and enable clearing participants to leverage their investments in provider infrastructures.

3.1 Network Structure

Network security and high availability are cornerstones of the CCorp design. IP network connectivity with rich security offers a compelling cost proposition especially as the bandwidth is increased and international connections are factored in. In the past few years IP networks have become a very tried and tested technology option to support business critical trading options. Private line connections segregate traffic and are supported by strong SLAs for availability and response times. These lines can be encrypted. Internet connections must be encrypted.

Customer connections are aggregated by a network provider and delivered to CCorp through lines that are redundant on two levels. Both Internet and private line connections have redundant feeds into CCorp's primary data center in Chicago. Additional fail over is provided at the CCorp disaster recovery site, located in a Chicago suburb. To ensure the highest level of availability, all network connections are monitored 24 hours a day.

Public Internet Connections

The Clearing Corporation's Public Internet offering provides the following features:

- Software-based Virtual Private Network (VPN)
- Minimum of 168-bit 3 DES encryption
- End-to-end connectivity monitoring
- Issue management and escalation
- The connection is the responsibility of the customer to implement and support. The network provider will assist the customer with any configuration issues that might arise.

Private IP Connections

The Clearing Corporation's private network connections offer the following features:

- Redundant leased circuits
- Guaranteed bandwidth
- Diverse network providers where possible
- Route diversity where possible
- End-to-end connectivity monitoring
- Issue management and escalation

3.2 IP VPN Connections

The Clearing Corporation's Secure IP Network offering can be used for all CCorp traffic. This is the least expensive solution for MQ and FTP data. Using software from Corente, this offering leverages the participant's existing private IP and public Internet infrastructure. Bandwidth is governed by the participant's Internet connection, competition for that bandwidth from other firm traffic, and the performance variables that influence other Internet-based applications. One advantage of this solution is that firms with high bandwidth Internet connections may experience faster response times than those with lower bandwidth private circuits. This connection is the responsibility of the business partner to implement and support. Corente provides monitoring, software updates, security credential distribution, and alerts; CCorp provides IP address resolution.

The Corente Solution is designed to scale to address various networking challenges. The basic software solution offers the following capabilities:

- IP VPN Connectivity
- Credential creation, distribution and revocation
- High security and tamperproof administration
- Automated software upgrades
- Easy to configure NAT rules to address conflict resolution

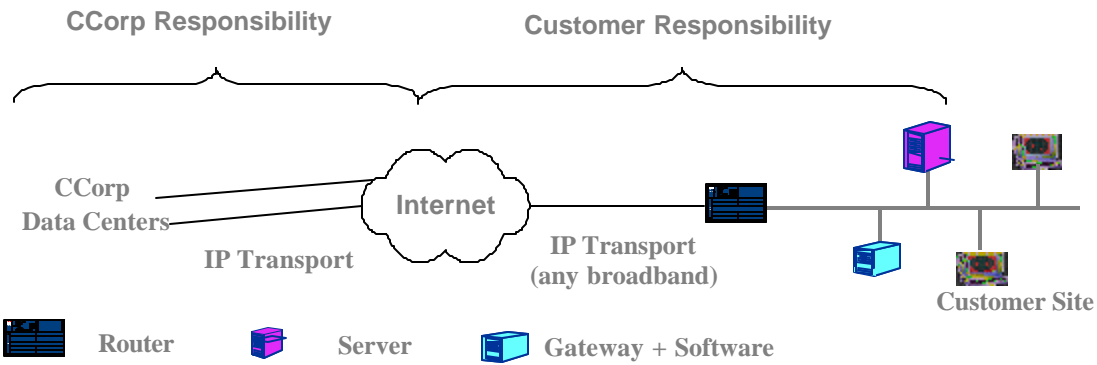
Additional features may be enabled to address additional networking challenges:

- Stateful Firewall
- Business continuity/hardware failover
- End-to-end application performance monitoring and management reporting
- Remote Access Capabilities
- Connectivity to other Clearing Corp. partners

The Secure IP Network solution requires a gateway server at the clearing participant location. Corente software running on the server provides the security capability and is required for the 24x7 monitoring and centralized management of the secure tunnel.

With the Secure IP Network solution, CCorp manages the IP address scheme. CCorp will ship a pre-configured gateway to the business partner. The business partner will install the machine, and Corente monitors connectivity between the business partner and CCorp. If a problem occurs with the network connection, the network service provider works with the business partner to resolve the issue. If a problem occurs with the gateway, Corente and CCorp work with the business partner to resolve the issue. Corente performs software upgrades as part of CCorp's monthly fee.

Public Broadband Network / Software VPN Design



Characteristics:

- IP Transport: Broadband Internet
- CoreNet monitors IPSec Tunnel (security tunnel)
- CCorp manages IPSec Tunnel
- Customer interfaces with its carrier of choice (ISP) – any existing Internet connection with at least 64kbps unused bandwidth is adequate.
- Customer uses its existing router(s) – devices used for Internet connection above
- Customer owns gateway hardware
- CCorp provides access to its facilities (ISP)
- Bandwidth is controlled by customer Internet connection

Notes for the VPN alternative:

- Gateway Software: Provides security capability (168 bit 3 DES encryption) and supports the 24 x 7 network monitoring.
- Appropriate firewall rules may need to be added to the customer's existing Internet connection to allow traffic through port 551.
- CCorp will designate IP addresses for network termination.
- A public IP address must be provided from the participant's Internet provider.

3.3 Private IP Connections

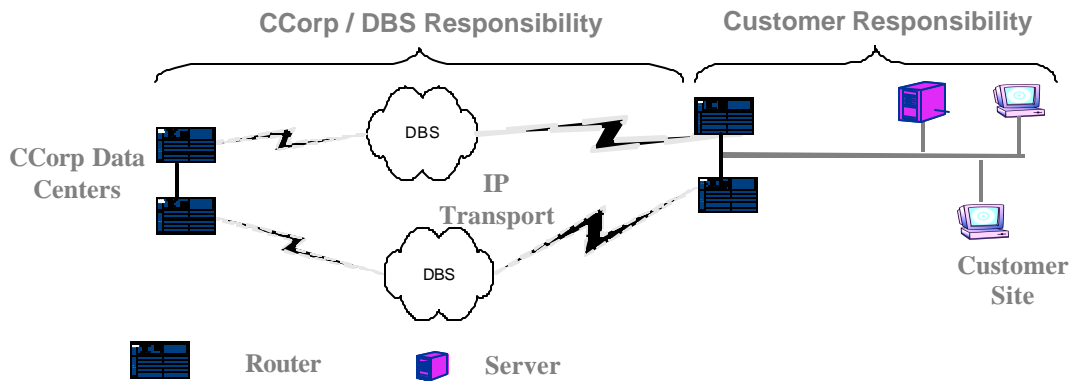
The CCorp offers several private network choices. These alternatives are more expensive than the Internet-based solution, but provide guaranteed bandwidth. The primary leased-line providers in Europe are Deutsche Börse Systems AG, Frankfurt (DBS) and Radianz, LLC. With these providers, most Clearing Link participants will be able to build on the infrastructures they use to communicate with Eurex, Reuters, or other businesses. The provider assumes monitoring, management, and performance responsibility for the network from source to destination.

3.3.1 Private Line Solution – DBS

For participants desiring to leverage the DBS network for US clearing, connectivity will be required to have, at a minimum, a 64 kbps channel dedicated to CCorp, as they have 64 kbps channels dedicated to Eurex AG and Eurex US. Higher bandwidths are available for firms desiring to use a private line for GUI transport.

In this offering, the customer installs, configures, and manages the redundant routers that reside on the clearing participant premises. DBS assumes responsibility for the circuit up to the participant's router.

DBS / Eurex Network Design



Characteristics:

- DBS provides two fully redundant dedicated circuits
- Customer provides and configures two fully redundant routers
- DBS monitors and manages end-to-end connectivity
- DBS manages and escalates carrier issues
- Business partner subscribes to bandwidth as needed (minimum 64 kbps)

Notes:

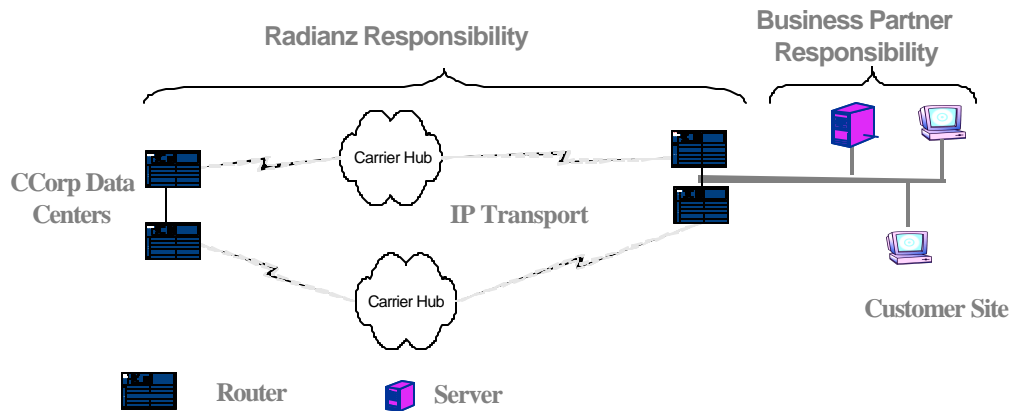
- Fully managed solution
- Primary IP Transport: Static E1 through primary carrier
- Backup IP Transport: Static E1 connection through secondary carrier
- Management Transport: IP transport mentioned above
- Appropriate firewall rules may need to be added to the customer's existing firewall to allow NTP protocol, protocol #50, and UDP port 500. Verification of appropriate firewall rules should be made with the CCorp technical staff.
- Customer configures hardware with DBS assistance.

3.3.2 Private Line Solution – Radianz

Participants choosing to leverage the Radianz Financial Industry Network for US clearing data will be required to have at least 64 kbps dedicated to CCorp. The Radianz network may have previously been installed at client offices for the purpose of delivering Reuters or other data. Higher bandwidths are available for firms desiring to use a private line for GUI transport.

The Radianz solution guarantees a minimum bandwidth but permits customer traffic to burst to use any unallocated bandwidth on the connection, typically an E1 that may also be leveraged by other companies. In this offering, the network provider installs, configures, and manages the redundant routers that reside on the clearing participant premises. Radianz assumes responsibility for the circuit through the Ethernet connection into the participant network.

Radianz Network Design



Characteristics:

- Radianz provides two fully redundant dedicated circuits
- Radianz provides two fully redundant dedicated routers
- Radianz manages end-to-end connectivity
- Radianz manages and escalates carrier issues
- Business partner subscribes to bandwidth as needed (minimum 64 kbps)

Notes:

- Fully managed solution
- Primary IP Transport: Static E1 or E3 through primary carrier
- Backup IP Transport: Static E1 or E3 connection through secondary carrier
- Management Transport: IP transport mentioned above
- Appropriate firewall rules may need to be added to the customer's existing firewall to allow NTP protocol, protocol #50, and UDP port 500. Verification of appropriate firewall rules should be made with the CCorp technical staff.
- Radianz or its agent will configure and install hardware. Physical access to the equipment must be provided to Radianz for service.

4 Support

CCorp will be the initial point of contact for all clearing-related support inquiries. Specifically, clearing participants should contact CCorp with any concerns about CCorp applications, the Internet VPN, or private IP connections. Please refer to Section 6 for contact information.

4.1 Public Internet connections

Clearing participants should work directly with an Internet Service Provider (ISP) to obtain a public Internet connection. Any ISP may be used, but CCorp recommends a bandwidth of 512 kbps or higher.

Clearing participant issues with their public Internet access should be directly addressed with the ISP.

4.2 Installations, changes, and disconnections

The destination clearing house (either CCorp or ECAG) will be the initial point of contact for dedicated circuit orders and changes. CCorp is the contact for all VPN orders and changes. Customers should follow the procedures outlined in Section 6 of this document.

Following order form submission, Eurex and CCorp will work with the customer and network provider to coordinate the required work and follow up with an end-to-end test. Eurex and CCorp will coordinate all provider visits to customer locations.

4.3 Network problem diagnosis and troubleshooting

CCorp network connections are monitored 24 hours a day, 7 days a week. If a customer experiences any difficulty accessing CCorp applications, the customer should notify CCorp immediately. CCorp will troubleshoot the issue and, if required, work with the appropriate provider to resolve.

4.4 Application problem diagnosis and troubleshooting

Any concern with CCorp application availability or performance should be directed to CCorp.

5 Pricing

Clearing participants who require only GUI access and use CCorp applications via the public Internet and a browser can do so at **no charge** to the clearing participant.

Clearing participants who require MQ and FTP access must obtain it via either the Internet VPN or private IP network. Pricing for these networks varies by connection type, participant location, and bandwidth required. Generally, 64 kbps bandwidth is sufficient for MQ traffic and file transfers.

5.1 Terms

There is no term commitment required for public Internet access to CCorp applications.

Private IP and Internet VPN connections require customer commitment to a minimum term of 12 months. If, for any reason, a clearing participant terminates a connection in the first 12 months, the clearing participant will be responsible for the full amount of the first year's financial obligation.

Disconnect terms vary by connection provider. For specifics, see the appropriate selection below.

The destination clearing house will bill all fees for private IP network connections (DBS and Radianz). CCorp will bill all fees for the Internet VPN solution.

5.1.1 DBS Disconnect Terms

Following the initial one-year commitment, a DBS network connection may be cancelled without charge, any time, provided 60 days' written notice is provided.

5.1.2 Radianz Disconnect Terms

Radianz requires a minimum commitment of one year per clearing participant, followed by automatically renewing one year commitments. If, for any reason, the customer terminates a connection before the 12-month term has been completed, the clearing participant will be responsible for the full amount of the remainder of the financial obligation due for the 12-month term.

5.2 Internet IP VPN Pricing

To install the Internet VPN, the clearing participant notifies CCorp that it wishes to use the Corente Internet-based solution. Participant contracts with a CCorp certified value-added-reseller (VAR) to purchase a machine that will be configured as a gateway. CCorp works with the VAR to configure the gateway. The gateway is shipped to the participant firm. The participant firm's technical staff, with assistance from CCorp or Corente, installs and supports this connection.

The basic CCorp offering includes all functionality required to transact business with CCorp:

- IP VPN Connectivity
- Credential creation, distribution and revocation
- High security and tamperproof administration
- Automated software upgrades
- Easy to configure NAT rules to address conflict resolution

As of August 30, 2004, fees for the VPN are:

Installation Fee	Monthly Fee
\$700, plus gateway hardware*	\$350

* Gateway hardware pricing may range from \$600 to \$2000, depending on customer model and style preference.

Partners wishing to take advantage of Corente software to address the following additional networking challenges may do so for the following monthly fees:

Service	Monthly Fee
Stateful Firewall	\$50
Business continuity/hardware failover	\$100
Connectivity to other Clearing Corporation partners	Contact CCorp for pricing
Remote Access Capabilities	Contact CCorp for pricing
End-to-end application performance monitoring and management reporting	Contact CCorp for pricing

5.3 Private Network Pricing

All fees will be paid to the destination clearing house. The key pricing determinants for both providers are location and bandwidth.

5.3.1 DBS Network

DBS groups European financial centres in 3 tiers. Pricing for connections in other cities will be evaluated on a case-by-case basis. Currently, the tiers are:

Tier 1: London

Tier 2: Frankfurt, Nurnberg, Munich, Amsterdam, Zurich, Geneva, and Paris

Tier 3: Helsinki, Madrid, Stuttgart, Berlin, Dusseldorf, Bonn, and Hamburg

All quoted prices include a pair of redundant private connections to a single customer site; e.g., specific building address. The customer furnishes and configures two routers.

Location	Installation Fee	64 KBPS Monthly	128 KBPS Monthly	256 KBPS Monthly	512 KBPS Monthly	1544 KBPS Monthly
Tier 1 Cities	\$2,000	\$1,300	\$1,700	\$2,200	\$3,000	\$4,900

Tier 2 Cities	\$2,000	\$1,500	\$1,900	\$2,500	\$3,400	\$5,600
Tier 3 Cities	\$2,000	\$1,700	\$2,300	\$3,100	\$4,000	\$6,600

5.3.2 Radianz Network

Most circuits are expected to be 64 kbps, bursting to E1. All quoted prices include a pair of redundant private connections to a single customer site; e.g., specific building address, and two routers. Radianz furnishes and configures the routers.

Radianz prices European financial centres in 4 zones. Rates for connections in other cities will be evaluated on a case-by-case basis. Currently, the zones are:

Zone 1: London

Zone 2: Frankfurt, Munich, Amsterdam, Zurich, Paris and Geneva

Zone 3: Helsinki, Madrid, Stuttgart, Berlin, Dusseldorf, and Hamburg

Zone 4: Nurnberg, Bonn

Zone	Installation Fee	64 KBPS Monthly	128 KBPS Monthly	256 KBPS Monthly	512 KBPS Monthly	1544 KBPS Monthly
1	\$2,000	\$1,300	\$1,800	\$2,400	\$3,600	\$6,300
2	\$2,000	\$1,500	\$2,000	\$2,800	\$4,100	\$7,300
3	\$2,000	\$1,700	\$2,400	\$3,400	\$4,800	\$8,500
4	\$2,000	\$2,300	\$3,500	\$5,500	\$8,700	\$15,000

5.3.3 Alternatives

If one of the above-mentioned networks cannot be expanded to a clearing participant site in a cost-effective and time-effective manner, another network provider will be found to deliver the requested service. Pricing for special-case locations may deviate from the tables above. Any custom solution will be priced as cost effectively as possible.

6 Order and Disconnect Process

To order an Internet VPN network connection, or change or disconnect an existing VPN connection, contact a Clearing Corporation Client Services and Support (CSS) representative.

To order a private network connection (DBS or Radianz), contact the destination clearing house (either Eurex AG or CCorp) support team.

Private network installation orders require a minimum lead time of six weeks; Internet VPN orders require a minimum of two weeks.

	CCorp Business Systems Group	Eurex Customer Support
Phone	312-786-5718	+49 69 211-11700
Fax	312-786-0152	+49 69 211-11701
email	css@clearingcorp.com	gcl.info@eurexchange.com

A sample Order/Change/Disconnect form follows. Form changes may be made independently of updates to this document. Please verify version level with your account representative, or download the form from the CCorp web site: <http://www.clearingcorp.com/>.



Please return to: Client Services and Support
 141 W. Jackson Blvd., Suite 1460
 Chicago, IL 60604
 312-786-5718
 css@clearingcorp.com

Network Request Form (Europe)

Function: Request new connections or removal of existing connections from The Clearing Corporation

Type of connection (circle one):

- a.) Corente Internet IP VPN
- b.) Private Network – DBS
- c.) Private Network – Radianz

Date: _____ Request (circle one) : Installation or Disconnect

Customer name: _____

Customer's (street or post box, city or town, country, postal code, and specific floor and/or site location):

Customer contact (responsible for telecom, network hardware, and network software implementation at customer location):

Name: _____ phone # _____ Email : _____

Name: _____ phone # _____ Email : _____

Circuit speed (if applicable) _____

Implementation notes (Specify any unusual requirements or time frames that could affect circuit or network hardware implementation):

PLEASE NOTE: Installation & disconnect fees apply to all network connections.

Version 1.2