Access to Eurex Exchange's T7, Eurex Clearing and Eurex Repo's F7

Network Configuration Guide

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1. List of abbreviations

The following list is limited to terminology and abbreviations, which are specific to Eurex. Basic IT terminology, such as FTP, TCP etc., is not explained in this document, which is aimed at technical roles (administrators) at participant sites.

Abbreviation or term	Description
AP	Access Point: One of its functions is to route data transactions to and from the back ends of the Exchange.
CIC	Clearing Interface Channel: A network configuration bundling Eurex Clearing interfaces.
Co-location	Co-location refers to a data center accommodating both, the Eurex back end infrastructure and the trading installations of Eurex participants. Deutsche Börse is providing such services in cooperation with Equinix Germany GmbH as a partner. Participants can rent rack space from Equinix in specific co-location rooms close to the back ends of the Exchange.
Common Report Engine	The Common Report Engine (CRE) allows the centralized provision of reports. Participants can retrieve reports and files from this report server using SFTP. The Common Report Engine is the sole source for reports from Eurex Exchange's T7, Eurex Classic and Eurex Clearing's C7.
Eurex EMDI	Eurex Enhanced Market Data Interface
Eurex EOBI	Eurex Enhanced Order Book Interface
Eurex ETI	Eurex Enhanced Trading Interface
Eurex MDI	Eurex Market Data Interface
Eurex RDI	Eurex Reference Data Interface
Exchange	Exchange refers to Eurex as the provider of Exchange services for derivatives trading.
F7 API	Eurex Repo's F7 application programming interface
iAccess	iAccess is the Internet based access for Eurex participants using an encryption tunnel. Please note, iAccess is not identical to the new Internet based GUI access.
ISP	Internet Service Provider
Participant	A participant is a clearing member or a non-clearing member that is connected to the Eurex market.
MIC	Multi Interface Channel: A network configuration bundling Eurex interfaces.

Abbreviation or term	Description
NetOps	Deutsche Börse Group Network Operations
TKAM	Technical Key Account Manager of Deutsche Börse
User	A user is a trader that logs into a Eurex system. e.g. into T7.

2. Introduction

This document is intended for participants' network administrators and provides an overview of the network access options to Eurex Exchange, Eurex Repo and Eurex Clearing. The document contains the required technical background information to gain network access to Eurex, such as router equipment information and port numbers for the configuration of firewalls.

Please note that this document focuses exclusively on the connectivity options introduced together with Eurex Exchange's T7, Eurex Repo's F7and the Eurex Clearing interfaces. This document does not provide information on legacy concepts such as the MISS infrastructure.

A description of network options for the Eurex legacy connections as well as other markets of Deutsche Börse Group, such as Xetra, please refer to the respective document "Network access to Exchange applications" also available on the Eurex Clearing or Xetra website:

www.eurexclearing.com -> Technology- > Eurex Clearing classic system -> System documentation -> Network, interfaces & reports -> Network

Eurex designed the new network connectivity concept to reflect the requirements of the new interface landscapes with the following components:

- High-bandwidth participant lines, based on Ethernet technology to address the higher bandwidth requirements of Eurex Exchange's T7.
- The Multi Interface Channel (MIC) for trading, clearing and market data interfaces and a new Clearing Interface Channel (CIC) for clearing services.
- Introduction of the Eurex GUI Channel for the T7 generation of GUI solutions and for the new Eurex Clearing GUIs.
- Eurex Repo's F7 channel to connect to the F7 trading GUI and the F7 API.

2.1 Eurex Exchange's T7 interface landscape

The launch of Eurex Exchange's T7 in December 2012 introduced a new trading interface landscape, replacing the existing trading interfaces. Legacy concepts such as the MISS infrastructure and VALUES API ceased to exist at the end of 2013.

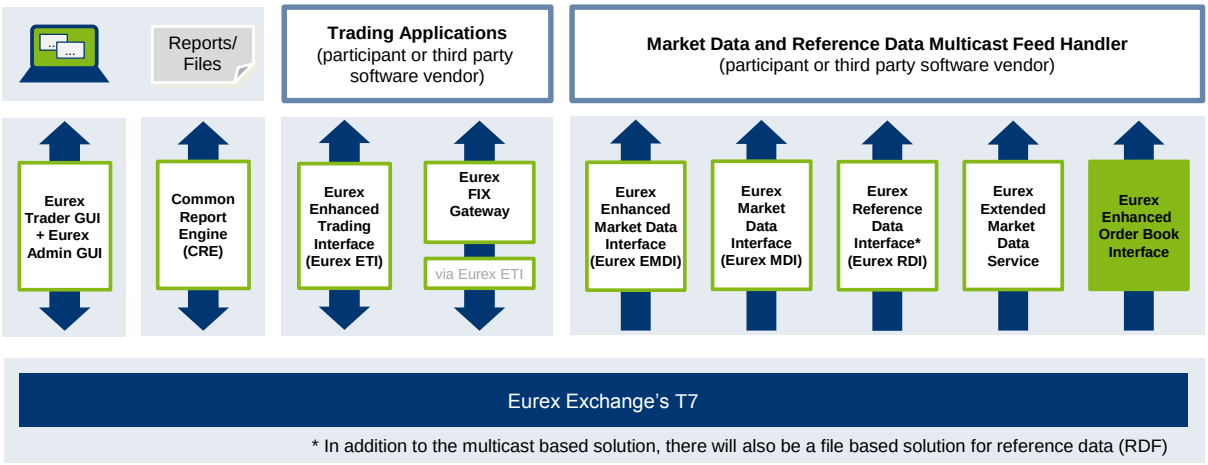


Figure 1: Interface landscape of Eurex Exchange's T7.

2.2 Eurex Clearing interface landscape

In addition to the new trading interface landscape, new interfaces have also been introduced on the Eurex Clearing side, such as the Eurex Clearing FIXML Interface and the Eurex Clearing FpML Interface.

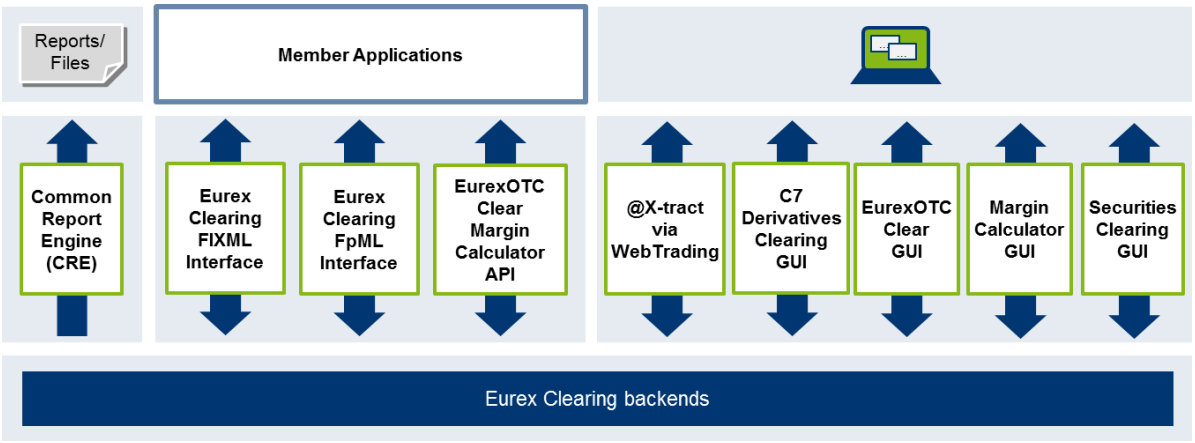


Figure 2: Eurex Clearing interface landscape

Over time the new interface landscape will completely replace the legacy interfaces for clearing services.

2.3 Eurex Repo's F7 interface landscape

Eurex Repo's F7 system replaces the previous Eurex Repo trading platform introducing a new F7 trading GUI and an F7 API allowing third party software to connect to the new platform.

2.4 Network overview

In order to support the respective Eurex[1] services, Deutsche Börse Group has established an efficient infrastructure representing a dedicated global IP network. Access from a participant location to Eurex must always be established via the Deutsche Börse Group's IP network.

Any participant connection to the back end systems must be established via Access Points (AP). APs, to which leased lines connect, are located throughout the world in major financial centers where Eurex participants are concentrated.

This concept allows Eurex to extend its private network up to the demarcation point of the carrier at the participant's site. Each AP is connected to the respective hosts via redundant leased lines. Participants are connected to an AP via dedicated leased lines and/or via the Internet.

2.4.1 Network security

Security is achieved by executing a number of measures, one of which is the AP which is the sole gateway between Eurex back end hosts and participant installations. Several participant installations are connected to the same AP. The functions and procedures implemented for an AP act as a firewall.

Typical IP services, such as Telnet, FTP, Finger, SMTP and RPC are not available via an AP. Passive and active security mechanisms are designed for all Eurex routers to ensure that the individual systems of the participants cannot communicate with each other across the network. The AP acts as a shield between the participant device and the back end hosts of Eurex.

As shown in Figure 3, if Participant A tries to access the network of Participant B, then the AP will prevent any kind of communication in that direction.

Also, the AP will stop any kind of unauthorized access to the back end. In the case of access via a VPN Internet connection, the participant is encouraged to use firewalls for additional security.

[1] The Deutsche Börse Group's network not only provides an IP backbone for Eurex, but also for other markets of the Deutsche Börse Group.

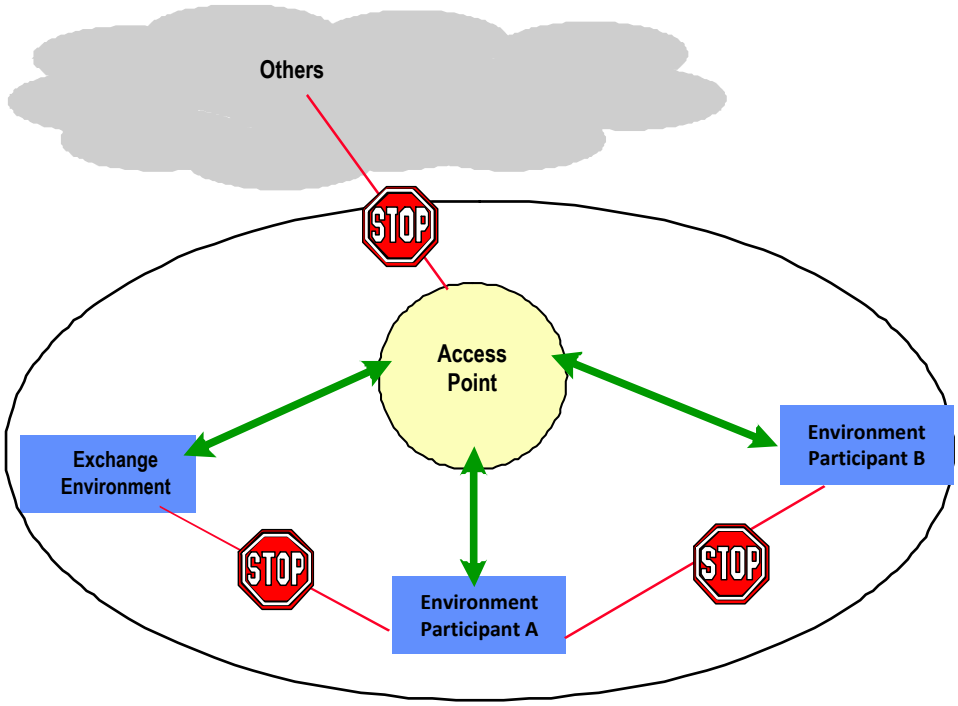


Figure 3: Access Point setup.

Two security features are established on all AP routers:

- Accessibility control feature: The IP networks belonging to installations of different participants are not reachable by others through the AP network.
- Transport control feature: The AP network only transports data belonging to the application-specific connection.

2.4.2 Network failover/Last mile redundancy

Eurex provides dual line options. Network failover is provided for the Layer 2 cross-site solution for the Eurex FIXML Clearing Interface, the Eurex Clearing FpML Interface, the EurexOTC Clear Margin Calculator API and the Enhanced Risk Solution.

To further enhance Eurex T7 connectivity, Eurex offers redundant access to both sides of the Eurex ETI Trading Gateway, Eurex FIX Gateway and Common Report Engine infrastructure via a Eurex MIC and to both sides of the T7 Trader and Admin GUI servers via a Eurex GUI channel.

The last mile redundancy enhancement facilitates a network routing failover in case a single circuit fails, while previously the client application was required to manage a failover to the other infrastructure side itself.

Excluded from this enhancement are combined access, iAccess, E1/T1 connections, 10Gbit/s co-location connections and single line connections.

As a result of this improved last line redundancy the following IP prefixes are propagated via both Eurex Exchange's T7 Ethernet WAN MIC/GUI connections in a dual connection setup.

	Simulation	Production
GUI Proxy Servers prefixes	193.29.89.224/28 193.29.95.224/28	193.29.91.224/28 193.29.93.224/28
Eurex ETI Trading Gateways prefixes	193.29.89.64/27 193.29.89.128/27 193.29.89.96/27 193.29.89.160/27	193.29.91.64/27 193.29.91.128/27 193.29.91.96/27 193.29.91.160/27
Common Reporting Engine prefixes	193.29.90.64/27 193.29.90.96/27	
FIX Gateway prefixes	90.150.253.0/24 90.151.253.0/24	

This enhancement also enables Eurex Participants to additionally increase their redundancy by using two instances of a redundant gateway protocol such as HSRP or VRRP in the Eurex T7 member LAN, thus avoiding impact of a member router failure.

Things to consider regarding last mile redundancy setup:

- When using a first hop gateway protocol such as HSRP or VRRP, the following should be considered.
  - Two HSRP/VRRP groups are recommended where each Eurex facing router has one active group, so that static routes on servers/firewalls for side 1 prefixes point to the side 1 active group virtual IP, and for side 2 prefixes to the side 2 active group virtual IP.
  - Care should be taken to ensure that the active groups and static routes are aligned with the primary paths for side 1 or 2.
- If only one HSRP/VRRP group is used and the server static routes use this virtual IP address, then the use of the BGP local-preference feature should be considered, to give the A prefixes preference over the A circuit and B over the B circuit.
- If BGP routing filters are used on the routers facing Eurex Exchange's T7 connectivity, the filters will need to be adapted to take advantage of the A/B failover via one circuit.
- If the new A/B failover is not desired, then BGP routing filters can be used to only enable the routes for the relevant side.

3. Procedures and responsibilities

The following chapter deals with the procedures and responsibilities with regard to getting connected to the Eurex back ends. Participants who would like to get connected are kindly asked for their cooperation in taking the necessary preparatory steps which are described below. The three major activities which are necessary for the participant to take part in are:

- consulting call
- end-to-end test
- connection test

Please contact your Technical Key Account Manager (TKAM) if you have any questions or comments with regard to the consulting call, the end-to-end test or the connection test (see chapter 8.1 for general contact information).

3.1 Getting connected

The following aspects are essential for participants who would like to get access to T7 and the Eurex Clearing back ends. The participant is asked to:

- choose the desired access options (see chapter 4) and order the connection with Eurex by placing the connectivity order in the Member Section under member.eurexchange.com or member.eurexclearing.com
- acquire and configure the necessary hardware (router and switches, see chapter 7),
- cooperate with the dedicated TKAM of Deutsche Börse Group and
- ensure that he has received and has access to the respective router configuration.

3.2 Consulting call

All participants who wish to connect to T7, F7 and/or Eurex Clearing need to arrange a consulting call with their TKAM and take part in subsequent testing (end-to-end test and connection test).

The aim of a consulting call is to make sure that:

- the participant is made aware of the relevant documentation,
- the connection test is being properly prepared,
- firewall and other restrictions and rules on the participant side are known and observed,
- open questions from the participant are answered by the TKAM or a Deutsche Börse Network Operations (NetOps) staff member,
- a final safety and sanity check before any changes are made.

A consulting call is attended by:

- the respective TKAM in charge,
- a Deutsche Börse Group NetOps staff member,
- a participant's network engineer having access to hardware and configurations to be tested,
- a project manager or assistant on the participant side (optional).

The TKAM will get in touch with his or her participant contact person to set up the date and time for the consulting call to take place.

3.3 End-to-end test

The goal of an end-to-end test is to make sure that:

- the participant line has been physically cabled,
- data from one end can get through to the other end,
- avoidable incidents or problems arising from malfunctioning physical connections can be prevented.

The prerequisites for performing an end-to-end test are as follows:

- The participant line must have already been delivered,
- The participant must have the line terminating on a device for which he may use temporary equipment, e.g. laptops,
- The participant must take care of all necessary on-site planning for the end-to-end connection test, e.g. presence of remote hands in data centers,
- Routers and trading services are excluded from the test.

An end-to-end test is attended by:

- a Deutsche Börse Group NetOps staff member and
- a participant's network engineer who is on-site.

The TKAM will get in touch with his or her participant contact person to set up the date and time for the end-to-end test to take place.

3.4 Connection test

The prerequisites for running a connection test are as follows:

- The consulting call must have been scheduled and must have taken place.
- The end-to-end test must have been run.

The goals of performing a connection test are:

- to check connectivity with regard to the new or changed infrastructure between Eurex and the participant,
- to activate line monitoring.

A connection test is attended by:

- a Deutsche Börse Group NetOps staff member and
- a participant's network engineer who is on-site.

The TKAM will get in touch with his or her participant contact person to agree upon the date and hour for the connection test to take place.

3.5 Network administration and responsibilities

The following table provides an overview of the respective responsibilities.

Role owner	Responsibilities	Definition
Eurex	Network administration and operation	Applies to network from back end to boundary of the carrier demarcation point at the participant's site
	All leased line connections	Procurement, installation and maintenance up to the demarcation point (includes cross connects in conjunction with co-location services)
Participant	Internet connection	Selection and provision of the Internet connection, selection of own Internet Service Provider (ISP)
	Internet connectivity and installation/configuration	Processing of Incidents and Problems
	External hardware	Administration and operation of equipment beyond the connection to Eurex (e.g. routers, workstations and other participant devices at participant sites)

4. Network connectivity

This chapter provides an overview of the connectivity options enabling participants to gain access to Eurex applications. In addition it also provides technical background information regarding the available connection types and connection.

4.1 Connection types

Eurex offers three connection types to its participants: Leased line based connections, iAccess (VPN) connections and native Internet connections.

4.1.1 Leased lines

Eurex provides connections with a service-specific dedicated bandwidth based on physical leased lines. The type and the bandwidth of the underlying network connection is determined at the discretion of the Exchange deciding whether line sharing with other Eurex services is to be applied (e.g. CCP services in addition to Eurex services on the same physical line). The following leased line connection types exist:

Leased line type	Specification	Available service/interface
E1	2 Mbit/s	**Multi Interface Channel** (Eurex MDI, Eurex ETI, Eurex FIX Gateway, Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface, Eurex Admin GUI, Eurex Extended Market Data Service), **Clearing Interface Channel** (Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface), **Common Report Engine**, **Risk Data Channel** (Eurex Enhanced Risk Solution, Eurex OTC Clear Margin Calculator API), Eurex Repo's F7 GUI, Eurex Repo's F7 API.
T1	1.5 Mbit/s	
Ethernet	10 Mbit/s with copper connectivity	**Multi Interface Channel** (Eurex MDI, Eurex ETI, Eurex FIX Gateway, Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface, Eurex Admin GUI, Eurex Extended Market Data Service), **Clearing Interface Channel** (Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface), **GUI Channel**, **Common Report Engine**, **Risk Data Channel** (Eurex Enhanced Risk Solution, Eurex OTC Clear Margin Calculator API), Eurex Repo's F7 GUI, Eurex Repo's F7 API.
	100 Mbit/s with copper connectivity	**Multi Interface Channel** (Eurex MDI, Eurex EMDI, Eurex RDI, Eurex ETI, Eurex FIX Gateway, Eurex Clearing FpML Interface, Eurex Clearing FIXML Interface, Eurex Admin GUI, Eurex Extended Market Data Service), **Clearing Interface Channel** (Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface), **GUI Channel**, **Common Report Engine**, **Risk Data Channel** (Eurex Enhanced Risk Solution, EurexOTC Clear Margin Calculator API), Eurex
	1 Gbit/s with copper connectivity or fiber connectivity	

Leased line type	Specification	Available service/interface
		Repo's F7 GUI, Eurex Repo's F7 API.
	10 Gbit/s with fiber connectivity (co-location only)	Type 1 - Market data interfaces: Eurex MDI, Eurex EMDI, Eurex RDI, Eurex Extended Market Data Service, Eurex Enhanced Order Book Interface Type 2 - Transaction interfaces: Eurex ETI, Eurex FIX Gateway, Eurex Clearing FIXML Interface, Eurex Admin GUI, Common Report Engine, Eurex Clearing FpML Interface

The following GUIs can be accessed via the GUI Channel: Eurex Trader GUI, Eurex Admin GUI, WebTrading GUIs, C7 Derivatives Clearing GUI, EurexOTC Clear GUI, Securities Clearing GUI and the EurexOTC Margin Calculator GUI.

The Eurex Admin GUI can also be accessed via the Multi Interface Channel and via the Transaction Services channel of a 10 GB connection.

Please note:

- 1 Gbit/s Ethernet connections in co-location are provided with an RJ45 presentation. These copper connections shall terminate on a layer 3 device.
- 10 Gbit/s Ethernet connections in co-location are provided as Single-Mode-Fiber (SMF).
- Leased lines are always delivered in full duplex mode.

4.1.2 iAccess (VPN)

The connection type iAccess is a point-to-point connection through the public Internet with an IPSec-encrypted tunnel building a virtual private network (VPN) between the participant's network and a Eurex Access Point. In order to use iAccess the participant is required to run a Cisco router at his own premises.

Please note that the GUI Channel is not offered on iAccess.

Specification	Available service
1.5, 2 or 5 Mbit/s as part of a combined connection with a leased line	**Multi Interface Channel** (Eurex MDI, Eurex Extended Market Data Service, Eurex ETI, Eurex FIX Gateway, Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface, Eurex Admin GUI), **Clearing Interface Channel** (Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface), **Risk Data Channel** (Eurex Enhanced Risk Solution, EurexOTC Clear Margin Calculator API)
5 Mbit/s for single iAccess connection	

The VPN connection with a 256 bit AES[2] encryption ensures a secure data transfer over the Internet. Eurex uses an authentication process with a Public Key Infrastructure (PKI) thus enabling communication in a closed user group.

The participant's infrastructure must meet the following connection requirements:

- An Internet connection is required from an ISP of the participant's choice. The bandwidth of the Internet connection should meet the bandwidth requirements of the iAccess connection.
- Internet access must be established by a router. The router for the Internet connection must meet the requirements of Eurex (see chapter 7).

  A static, registered public Internet IP address must be available at the participant's Internet connection (to be requested from the respective ISP). The encryption mechanism used for iAccess requires a static public IP address.

4.1.3 Native Internet

The native Internet connection type does not rely on an encrypted VPN through the Internet (see preceding chapter on iAccess), as these services (e.g. Eurex Trader GUI, Common Report Engine) have a self-contained encryption mechanism for their traffic.

Specification	Available service
Bandwidth requirements dependent on the service used	Common Report Engine, Eurex Trader GUI, Eurex Admin GUI, WebTrading, C7 Derivatives Clearing GUI, EurexOTC Clear GUI, EurexOTC Margin Calculator GUI, Securities Clearing GUI and future GUI solutions, Eurex Repo's F7 GUI, Eurex Repo's F7 API.

This type of connection is characterized by open internet traffic and does not have to be used exclusively for access to Eurex. Eurex recommends a dedicated Internet connection or a shared connection. Any connection to an ISP may be used. However, on the Eurex side the usable bandwidth is limited to the bandwidth offered for the respective service.

4.2 Connection options

Connection types are combined into connection options offered by Eurex and include the following combinations:

- Two leased lines as standard connection
- Combined connection - one leased line plus iAccess
- Single leased line connection
- iAccess connection

[2] Existing connections are using a 168 bit 3DES encryption. The participant can continue to use this encryption.

- Native Internet connection
- 10 Gbit/s connections within co-location

4.2.1 Two leased lines as standard connection

The following setup of two leased lines offers the highest availability of all connection options the participant can choose from.

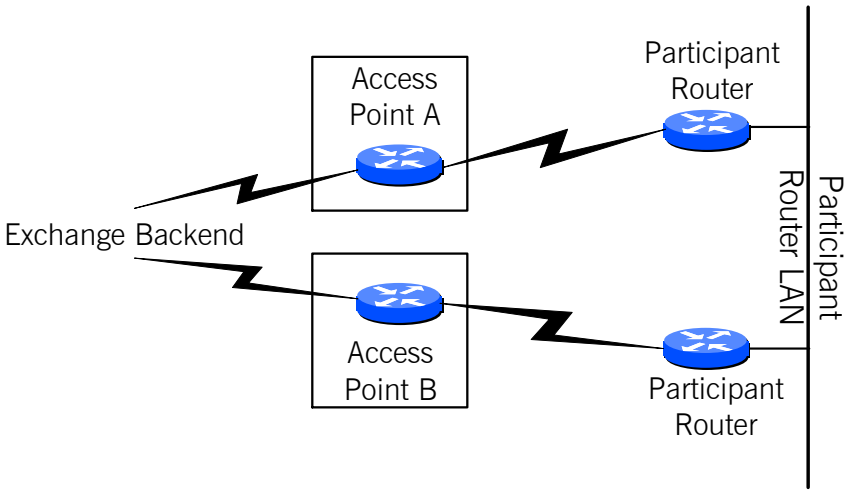


Figure 4: Connection via two leased lines

Technical implementation:

Eurex provides bandwidth on a leased line. If possible, two leased lines are ordered from different providers with separate infrastructure (separate cabling and technical components, i.e. dual rail concept). In geographic areas where multiple telecommunication providers are not available, measures ensuring the highest possible degree of redundancy are taken.

It is possible to terminate both connections in separate locations (split location). Eurex assigns the same private IP address range to both connections.

The provision, operation and administration of the interconnection between both participant locations (routers) are within the participant's responsibility.

Please see chapter 7 for router equipment recommendations for the various types of connections.

4.2.2 Combined connection - one leased line plus iAccess

This solution offers high availability. The leased line is normally used as the primary connection and the iAccess connection is mostly used for backup purposes. However, both connections have equal rights connecting to Eurex.

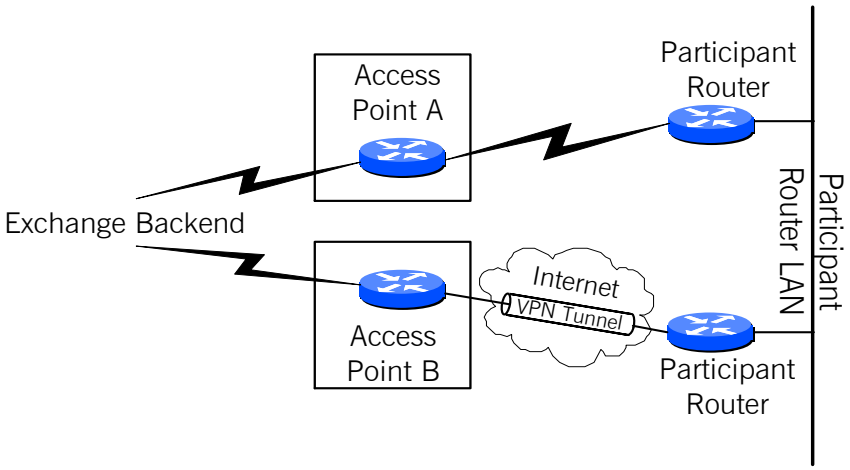


Figure 5: One leased line plus iAccess connection

Technical implementation:

Eurex provides bandwidth on a leased line whereas the participant is responsible for the provision and availability of the Internet connection. It is possible to terminate both connections in separate locations (split location). Eurex assigns the same private IP address range to both connections. The provision, operation and administration of the interconnection between both participant locations are the participant's responsibility.

The iAccess portion of the connection relies on an encrypted Internet VPN which is why the participant router must be a Cisco model meeting the requirements of Eurex (see chapter 7).

4.2.3 Single leased line connection

The single leased line connection provides a basic connection to the Eurex back end. As the single line option does not allow for a line failover, single leased line connections are normally not intended for trading installations but may be suitable for disaster recovery and participant's backup locations. A single line does not have full access to the infrastructure. In addition, participants are at a disadvantage if they only take a single line for market data.

Please note that Eurex Clearing members are required to have redundant connections to Eurex, such as connections with two leased lines or combined connections (one leased line and one iAccess connection) or two iAccess connections.

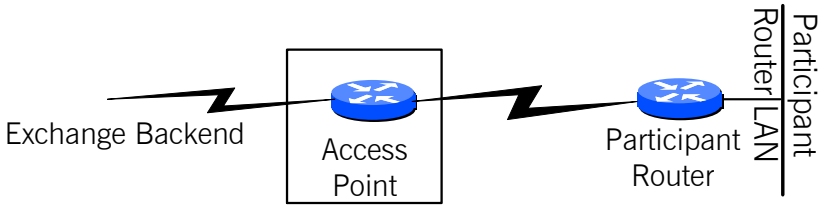


Figure 6: Single leased line connection

Technical implementation:

Eurex provides bandwidth on a leased line. The participant router is supposed to meet the router requirements of Eurex (see chapter 7).

4.2.4 iAccess connection

The connection option iAccess is a permanent point-to-point connection through the public Internet with an IPSec-encrypted tunnel building a virtual private network (VPN) between the participant's network and a Eurex Access Point.

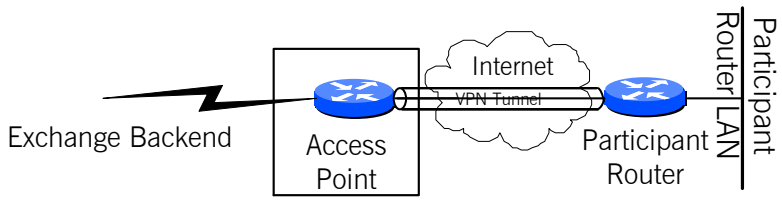


Figure 7: iAccess connection

Technical implementation:

In order to use iAccess the participant is required to run a router at his own premise. The router establishes a 256 bit AES encrypted IPSec VPN connection. An authentication process with a Public Key Infrastructure (PKI) is used.

The participant's infrastructure must meet the following connection requirements:

- The Internet connection must be from an ISP of the participant's choice.
- The Internet connection bandwidth must meet the VPN requirements.
- The router used to establish the Internet connection must meet the requirements in chapter 7.
- A static, registered public Internet IP address for the encryption mechanism must be used.

4.2.5 Native Internet connection

The native Internet connection is suitable for Eurex applications with a self-contained encryption mechanism for the participant's traffic, which does not rely on an encrypted VPN through the Internet, such as the Eurex Trader GUI, the C7 Derivatives Clearing GUI or the Common Report Engine.

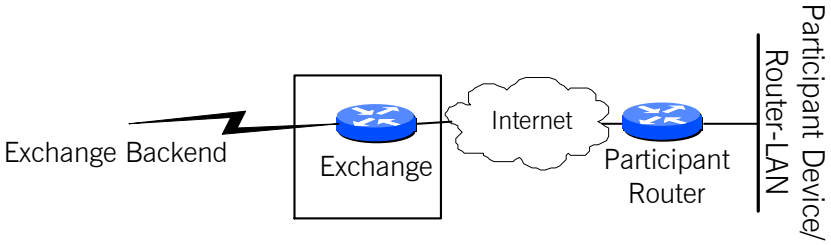


Figure 8: Native Internet connection

Technical implementation:

This connection option is based on open and unencrypted Internet traffic. The available bandwidth is primarily determined by the participant's individual Internet access. The respective Eurex service defines how much bandwidth is required (for instance, the bandwidth required per open Eurex Trader GUI screen). The participant is responsible for the provisioning of his Internet connection.

4.2.6 10 Gbit/s connections within co-location

Eurex offers 10 Gbit/s Ethernet dedicated cross connects in co-location to provide latency-sensitive applications with the fastest possible connection to Eurex Exchange's T7. Two separate 10 Gbit/s connection options are available:

- Type 1 – Market and reference data for Eurex EMDI, Eurex MDI, Eurex EOBI, Eurex Extended Market Data Service, and Eurex RDI (Simulation and Production)
- Type 2 – Transactions allowing access for Eurex ETI, Eurex FIX Gateway, Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface, Eurex Admin GUI and Common Report Engine (Simulation and Production)

Please note: One cross-connect option can serve only one type of data, either market and reference data or transaction data.

The 10 Gbit/s connection offering is coupled with co-location services provided by Equinix as the service provider in the co-location data center. Roles and responsibilities are defined as follows:

Service	Provisioning/Action	Role owner
Port in Eurex switch	One 10 Gbit/s port, provided at a patch field	Eurex
External co-location service	Rack and cabinet space for the participant's hardware components	Equinix as service provider
Connection between patch field in participant rack and participant device	Providing and operating own hardware devices as well as the connection within the participant rack	Participant

Technical implementation:

Eurex participants are able to operate dedicated 10 Gbit/s cross connects for each interface as a direct port (1) or switch port (2) connection, as indicated in the figure below.

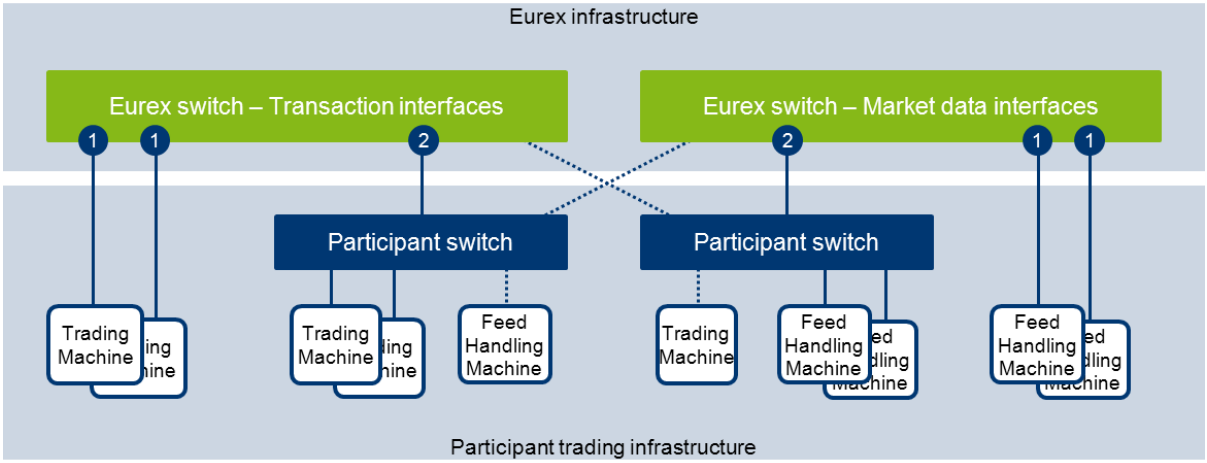


Figure 9: 10 Gbit/s peerless layer 2 connection to server or switch

The 10 Gbit/s connections are characterized as follows:

- 10 Gbit/s connections are always provided as Single-Mode-Fiber (SMF).
- A 10 Gbit/s connection is based on a peerless layer 2 connection with no support for routing or PIM protocols.
- 10 Gbit/s connections allow for a direct connection of a server or via an own layer 2 switch. In both options, a direct connection to the Eurex switch is established.
- Participants are free to use any hardware vendor. Eurex does not make any restrictions.
- Each connection has a /25 subnet (participant LAN) assigned. Two connections form a redundant pair having two consecutive /25 subnets are assigned via different APs.
- Provision of only one service type per fiber, i.e. either Eurex Enhanced Market Data Interface or Eurex Enhanced Trading Interface.
- No Quality of Service (QoS) mechanisms are supported by 10 Gbit/s connections.

The 10 Gbit/s connections allow connecting either a layer 2 switch or a server directly to the Eurex switch. If a server is connected, the following prerequisites apply:

- Provide access to both Simulation and Production environments.
- Connected servers need a logical interface, e.g. a physical Network Interface Card (NIC) or a virtual dot1Q interface.
- The logical interface must be configured in the subnet assigned by Eurex (participant LAN).

5. Service separation by channels

In order to separate services and to support Quality of Service (QoS) concepts for services running on a leased line or via an iAccess Internet VPN, Eurex uses a concept based on traffic shaping. This includes the configuration of a Multi Interface Channel, a Clearing Interface Channel, a GUI Channel, and Risk Data Channel.

5.1 Multi Interface Channel

The Multi Interface Channel (MIC) as a separation of bandwidth using traffic shaping mechanisms combines Eurex interfaces. To avoid any interference of multicast based market/reference data and transactional data within a MIC, a traffic shaping mechanism is used to separate market/reference data from the transactional interfaces (from 5 Mbit/s MIC onwards).

In addition to the MIC a leased line can carry more channels, such as a GUI Channel or channels for Xetra or other exchanges of Deutsche Börse Group, all separated by traffic shaping mechanisms. However, the MIC cannot be on the same leased line/iAccess connection as the Clearing Interface Channel. The following figure provides an exemplary overview of the channel configuration for high and low bandwidth lines.

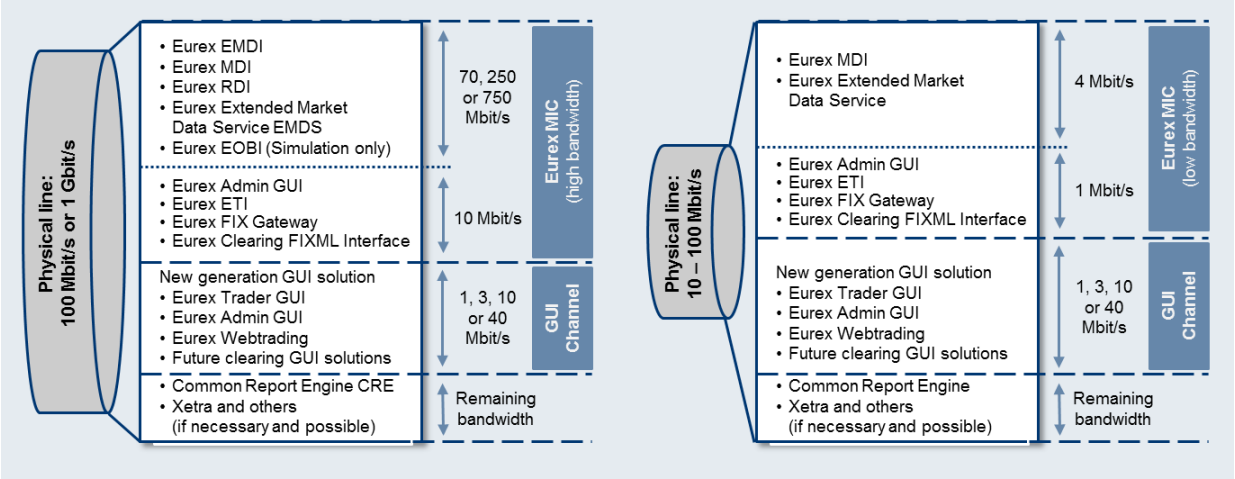


Figure 10: Configuration of MIC and additional channels on two types on leased lines

5.1.1 Eurex Interfaces on a MIC

Within a Eurex MIC access to the following Eurex interfaces is possible:

- Eurex EMDI (Enhanced Market Data Interface, only on high bandwidth MICs)
- Eurex RDI (Reference Data Interface, only on high bandwidth MICs)
- Eurex MDI (Market Data Interface)
- Eurex Extended Marked Data Service
- Eurex Admin GUI

- Eurex ETI (Enhanced Trading Interface)
- Eurex FIX Gateway
- Eurex Clearing FIXML Interface
- Eurex Clearing FpML Interface

Please note: In order to access the WebSphere MQ infrastructure for the Eurex Clearing FIXML Interface and Eurex Clearing FpML Interface, a z/OS channel is required. Please contact your TKAM for further details.

5.1.2 Bandwidth

The availability of the Eurex market data interface for un-netted market data (Eurex EMDI) and reference data (Eurex RDI) within a MIC depends on the bandwidth of the leased line the MIC is configured on.

MICs are currently offered in various bandwidth options:

- 760 Mbit/s for un-netted market data via the Eurex EMDI is recommended to provide un-netted market data for a broad set of options (all market data) and futures products and for reference data via the Eurex RDI.
- 260 Mbit/s for un-netted market data via the Eurex EMDI is suitable for a subset of options and futures products and for reference data via the Eurex RDI.
- 80 Mbit/s for un-netted market data via the Eurex EMDI is suggested for futures products and only a small subset of options products (e.g. for users in the United States) and for reference data via the Eurex RDI.
- 5 Mbit/s (2 or 1.5 Mbit/s in some regions) for netted market data via the Eurex MDI only. Un-netted market data via the Eurex EMDI and reference data via the Eurex RDI are not available in this configuration (reference data must be obtained from the reference data file).

Please note that Eurex MDI and the Eurex Extended Market Data Service are available for all bandwidth options. Eurex EOBI is available on 10 Gbit/s lines only.

5.2 Clearing Interface Channel

The Clearing Interface Channel (CIC) is based on exactly the same technology as the MIC. The CIC is available for customers of Eurex Clearing which have no legal contract with Eurex Frankfurt in order to enable these customers access to the Eurex Clearing FIXML Interface and the Eurex Clearing FpML Interface. The CIC and the MIC cannot share the same leased line/iAccess connection.

Please note that from a legal point of view, access to CCP 64kbit/s connection is part of the Clearing Interface Channel. However, the technical access to CCP might be implemented differently.

The following figure provides an exemplary overview of the channel configuration:

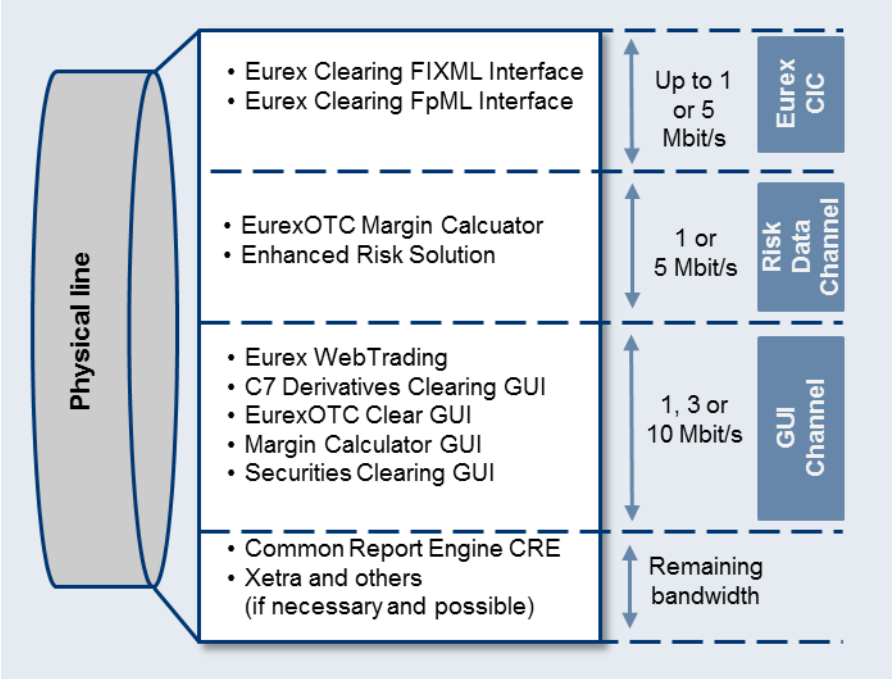


Figure 11: Configuration of CIC and additional channels

5.2.1 Eurex Clearing Interfaces on a CIC

Within a Eurex Clearing CIC access to the following Eurex Clearing interfaces are possible:

- Eurex Clearing FIXML Interface
- Eurex Clearing FpML Interface

5.2.2 Bandwidth

CICs are currently offered in various bandwidth options:

- Up to 1 Mbit/s
- 5 Mbit/s

5.3 GUI Channel

Access to the Eurex Exchange's T7 and new Eurex Clearing GUI solutions (e.g. Eurex Trader GUI, Eurex Admin GUI, C7 Derivatives Clearing GUI and WebTrading) is available via the GUI Channel on leased lines or via Internet connections.

A GUI Channel can be ordered in the Member Section with various bandwidth options. Eurex currently offers 1 Mbit/s, 3 Mbit/s, 10 Mbit/s and 40 Mbit/s GUI Channels. The 40 Mbit/s GUI Channel is not offered for Eurex Clearing only members.

The maximum bandwidth requirement per open Eurex T7 GUIs or for one WebTrading session is approximately 300 Kbit/s. Based on this assumption a maximum of three concurrently open Eurex T7 GUIs/WebTrading sessions can be used per 1 Mbit/s GUI Channel.

Technically, a GUI Channel on a leased line is configured using traffic shaping mechanisms, similar to the Multi Interface Channel.

Please note: A GUI Channel can be ordered in conjunction with a MIC or as a stand-alone product. Eurex currently offers the stand-alone GUI channel with 5 Mbit/s, 10 Mbit/s and 40 Mbit/s.

In addition to the GUI Channel configured on a leased line, access to the Eurex Trader GUI, Eurex Admin, WebTrading, C7 Derivatives Clearing GUI, EurexOTC Clear GUI, the EurexOTC Clear Margin Calculator GUI and the Securities Clearing GUI is also possible via Internet connections.

Eurex does not limit the number of open GUIs that can be used via Internet connections and the limitation depends on the bandwidth of the participant's Internet access.

5.4 Risk Data Channel

The Risk Data Channel combines network traffic for the risk related systems of Eurex Clearing. Figure 11 provides an exemplary overview of the channel configuration.

5.4.1 Eurex Clearing Interfaces on the Risk Data Channel

Within a Risk Data Channel access to the following Eurex Clearing interfaces is possible:

- Enhanced Risk Solution
- EurexOTC Clear Margin Calculator API

5.4.2 Bandwidth

The Risk Data Channel is currently offered in various bandwidth options:

- 1 Mbit/s: This bandwidth is sufficient for the Enhanced Risk Solution or for low bandwidth requirements for the EurexOTC Clear Margin Calculator API.
- 5 Mbit/s: This bandwidth is recommended for a shared usage of the Enhanced Risk Solution and the EurexOTC Clear Margin Calculator API or for high bandwidth requirements for the EurexOTC Clear Margin Calculator API.

Please note: In order to access the WebSphere MQ infrastructure for the EurexOTC Clear Margin Calculator API, a z/OS channel is required. Please contact your TKAM for further details.

5.5 Eurex Repo's F7 Channel

A single dedicated channel for Eurex Repo's F7 can be placed on a leased line alone or together with an existing Multi Interface channel.

5.5.1 Eurex Repo's F7 Interfaces on a Eurex Repo's F7 channel

Within a Eurex Repo F7 channel, access to the following Eurex Repo F7 interfaces is possible:

- Eurex Repo F7 Trading GUI
- Eurex Repo F7 API

5.5.2 Bandwidth

The Eurex Repo F7 channel is currently offered in various bandwidth options depending on the number of users running over the channel.

Number of active users	Bandwidth Option
1	0.5 Mbit/s
Up to 2	1.0 Mbit/s
Up to 6	3.0 Mbit/s
Up to 12	5.0 Mbit/s
Up to 25	10.0 Mbit/s

6. Eurex interfaces

Trading services are provided by Eurex Exchange's T7 trading architecture. Eurex Clearing will initially continue to use the current system and will migrate functions to its new C7 Clearing infrastructure. This technical separation leads to different interfaces to be supported for different purposes.

To use both Eurex trading and clearing services, participants require access to both systems:

- For order book trading of any Eurex products, access to T7 is necessary.
- For clearing purposes (trade maintenance, position management, etc.) access to the Eurex classic system must be maintained.
- For the usage of functionality offered by the new Eurex Clearing C7 system, access to the Eurex Clearing C7 system is required.

Access to Eurex trading and clearing interfaces is only possible using the connection options as described in chapter 4.2 with the configuration of a Multi Interface Channel or a Clearing Interface Channel and a GUI Channel respectively as described in chapter 5.

To gain access to the Eurex interfaces, connections to certain servers/gateways identified by certain IP addresses and ports and/or multicast IP addresses must be allowed from the participant's network. This chapter describes the Eurex Exchange's T7 trading and Eurex Clearing interfaces and lists IP addresses and ports necessary for access via these interfaces.

The following table contains an overview of the available interfaces of Eurex Exchange's T7, the Eurex Clearing interfaces and common interfaces:

Eurex Exchange's T7 interfaces	Eurex Enhanced Trading Interface Eurex FIX Gateway Eurex Enhanced Market Data Interface Eurex Enhanced Order Book Interface Eurex Market Data Interface Eurex Extended Market Data Service Eurex Reference Data Interface Eurex Trader GUI Eurex Admin GUI
Eurex Clearing interfaces	Eurex Clearing FIXML Interface Eurex Clearing FpML Interface Eurex Enhanced Risk Solution EurexOTC Clear Margin Calculator API @X-tract GUI via WebTrading C7 Derivatives Clearing GUI EurexOTC Clear GUI EurexOTC Clear Margin Calculator GUI Securities Clearing GUI
Common services	Common Report Engine

6.1 Eurex Exchange's T7 interfaces

6.1.1 Eurex Enhanced Trading Interface (Eurex ETI)

The Eurex ETI is an asynchronous message-based interface. A connection between participants and Eurex is established via a TCP/IP connection. The interface is session-oriented. A session is established between the participants' machine and a Eurex ETI gateway.

In order to establish a session with a trading gateway, a TCP/IP connection to a connection gateway must be established first. The connection gateway provides the connection parameters for the assigned primary and secondary gateway to be used for trading purposes. This process is described on a high level in the diagram below.



Figure 12: Eurex ETI session logon process

The gateway infrastructure of Eurex is built redundantly, as indicated in the figure below. A set of gateways including a connection gateway, trading gateways for low frequency (LF) sessions and trading gateways for high frequency (HF) sessions is primarily attached to one line connection of a participant. A redundancy link between side A and side B ensures network failover for redundant two leased line installations.

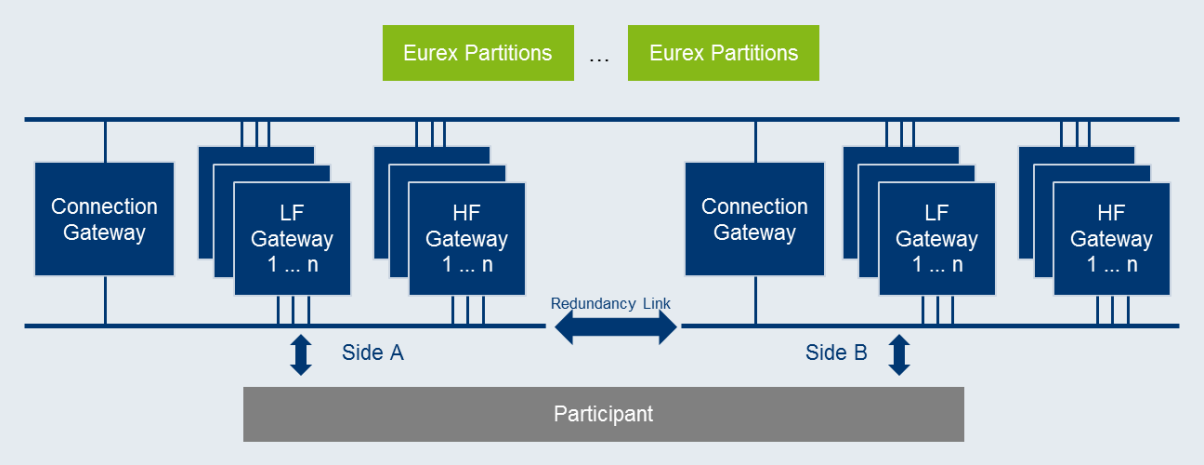


Figure 13: Eurex ETI gateway infrastructure

For this reason, participants are advised to order a redundant leased line setup (connection option with two leased lines). If one leased line connection fails, the other connection gateway and the corresponding set of LF and HF trading gateways can still be accessed.

The IP addresses of the trading gateway and the connection gateway assigned per session are to be obtained as follows:

- The IP address of the connection gateway is provided during the ordering process for a Eurex ETI session (in addition to other connection parameters, such as the session password).
- The IP address of the gateway to be used for a trading session is assigned by the connection gateway during the logon process (as described above).
- The IP subnets of the IP addresses the connection gateways and the gateways for trading purposes are assigned in and the respective ports are listed in the table below. Please note that the IP subnets for HF trading gateways are different from the IP subnets of the other gateways.

Environment	Gateway type	IP subnets		Ports	Protocol
		Side A	Side B		
Production	HF trading gateways	193.29.91.128/27	193.29.91.160/27	19006	TCP/IP
	LF trading gateways	193.29.91.64/27	193.29.91.96/27		
	Connection gateways	193.29.91.64/27	193.29.91.96/27	19008	TCP/IP
Simulation	HF trading gateways	193.29.89.128/27	193.29.89.160/27	19506	TCP/IP
	LF trading gateways	193.29.89.64/27	193.29.89.96/27		
	Connection gateways	193.29.89.64/27	193.29.89.96/27	19508	TCP/IP

IP addresses of the Eurex ETI gateways in production are listed in the table below:

Environment	Gateway #	Gateway type	Participant connection	IP address
Production	H02	HF trading gateway	Side A	193.29.91.129
	H04	HF trading gateway	Side A	193.29.91.130
	H06	HF trading gateway	Side A	193.29.91.131
	H08	HF trading gateway	Side A	193.29.91.132
	H10	HF trading gateway	Side A	193.29.91.133
Production	H12	HF trading gateway	Side A	193.29.91.134
	H14	HF trading gateway	Side A	193.29.91.135
	H16	HF trading gateway	Side A	193.29.91.136
	H01	HF trading gateway	Side B	193.29.91.161
	H03	HF trading gateway	Side B	193.29.91.162
	H05	HF trading gateway	Side B	193.29.91.163
	H07	HF trading gateway	Side B	193.29.91.164
	H09	HF trading gateway	Side B	193.29.91.165
	H11	HF trading gateway	Side B	193.29.91.166

Environment	Gateway #	Gateway type	Participant connection	IP address
	H13	HF trading gateway	Side B	193.29.91.167
	H15	HF trading gateway	Side B	193.29.91.168
	L02	LF trading gateway	Side A	193.29.91.65
	L04	LF trading gateway	Side A	193.29.91.66
	L06	LF trading gateway	Side A	193.29.91.67
	L01	LF trading gateway	Side B	193.29.91.97
	L03	LF trading gateway	Side B	193.29.91.98
	L05	LF trading gateway	Side B	193.29.91.99
	C02	Connection gateway	Side A	193.29.91.65
	C01	Connection gateway	Side B	193.29.91.97

IP addresses of the Eurex ETI gateways in simulation are listed in the table below:

Environment	Gateway #	Gateway type	Participant connection	IP address
Simulation	H01	HF trading gateway	Side A	193.29.89.129
	H03	HF trading gateway	Side A	193.29.89.130
	H02	HF trading gateway	Side B	193.29.89.161
	H04	HF trading gateway	Side B	193.29.89.162
	L01	LF trading gateway	Side A	193.29.89.65
	L03	LF trading gateway	Side A	193.29.89.66
	L05	LF trading gateway	Side A	193.29.89.67
	L07	LF trading gateway	Side A	193.29.89.68
Simulation	L02	LF trading gateway	Side B	193.29.89.97
	L04	LF trading gateway	Side B	193.29.89.98
	L06	LF trading gateway	Side B	193.29.89.99
	L08	LF trading gateway	Side B	193.29.89.100
	C01	Connection gateway	Side A	193.29.89.65
	C02	Connection gateway	Side B	193.29.89.97

6.1.2 Eurex FIX Gateway

The FIX connection between a Eurex participant's infrastructure and the Eurex FIX Gateway is established via a TCP/IP connection.

The Eurex FIX Gateway infrastructure is built redundantly, as indicated in the diagram below. One set of gateways is primarily attached to one line connection of a participant. A redundancy link between side A and side B ensures network failover for redundant two leased line installations.

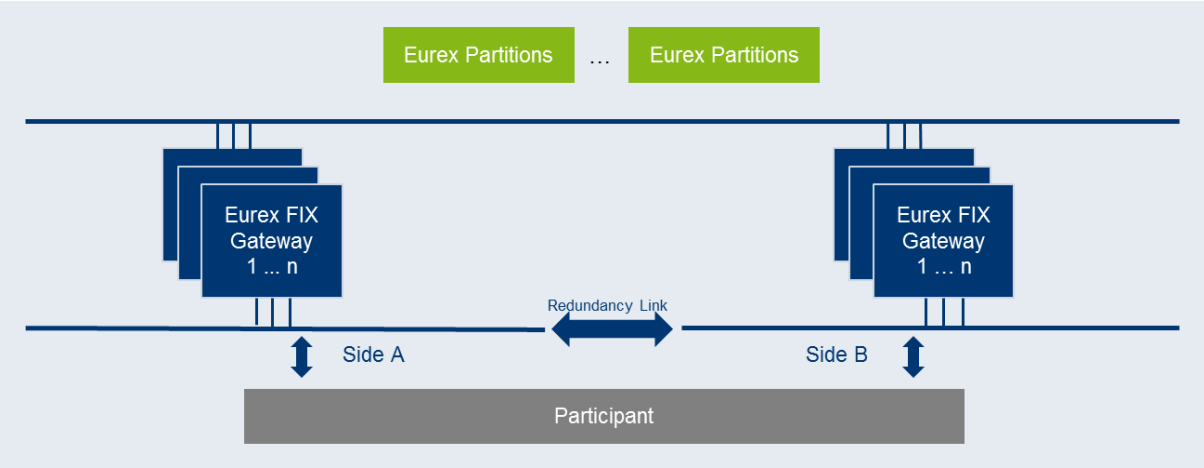


Figure 14: Eurex FIX Gateway infrastructure

For this reason, participants are advised to order a redundant leased line setup (connection option with two leased lines). If one leased line connection fails, the other Eurex FIX Gateway can still be accessed.

For each FIX session, two individual IP addresses and port numbers per environment (simulation and production) are assigned and provided during the ordering process of the FIX session, one for a primary gateway and one for a secondary gateway. Only the assigned gateways accept connection requests from clients using a respective session ID.

Participants may choose any of the two assigned IP address and port number combinations. However, Eurex suggests using the primary gateway IP address as the primary connection and the secondary gateway IP address as the backup connection. The participant is free to use any source address from its assigned member LAN.

Please note that a simultaneous logon with the same SenderCompID (49) to both gateways is not possible.

The following IP addresses in the respective IP subnets are assigned for the Eurex FIX gateways:

Environment	Connection option	IP addresses	IP subnets	Ports	Protocol
Production	Leased line - side A	90.150.253.31	90.150.253.0/24	individually assigned	TCP/IP
	Leased line - side A (for future use)	90.150.253.43			
	Leased line - side B	90.151.253.31	90.151.253.0/24		
	Leased line - side B (for future use)	90.151.253.43			
Simulation	Leased line - side A	90.150.253.32	90.150.253.0/24	individually assigned	TCP/IP
	Leased line - side B	90.151.253.32	90.151.253.0/24		

6.1.3 Eurex and EEX Market Data Interface (MDI)

The Eurex MDI provides netted price-level aggregated market data. It is a flexible, transparent, UDP based interface which disseminates market data from Eurex Exchange's T7 to participants over a multicast network. The messaging protocol used by Eurex MDI is fully compliant to the FIX protocol version 5.0 SP2 and the interface conforms to the FAST (FIX Adapted for Streaming) protocol version 1.2 principles for efficient bandwidth utilization.

The interface provides participants with the information in form of data feeds. The data feeds match to multicast groups, participants can join to receive market data for certain product groups.

Eurex MDI data feeds are distributed in a "live-live" concept by disseminating two services, A and B. Both services are identical in terms of the information provided, but utilize different multicast groups. Only one service (A or B) is transmitted per leased line connection. Each service (A or B) is linked to the transmitting leased line. Service A is available on side A and service B is available on side B. An automatic failover of the respective service in case of a line failure is not possible.

Due to the inherent unreliable nature of the delivery mechanism of the UDP protocol, packets may be lost in transmission, arrive out of order or may be duplicated. Participants are advised to subscribe to both services simultaneously on different leased lines to reduce the possibility of data loss.

The following multicast group ranges and ports are used for the Eurex MDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.50.64-74 224.0.29.72-79	224.0.50.192-202 224.0.30.72-79	59000	59032
	Source networks	193.29.91.192/28	193.29.91.208/28	-	
Simulation	Multicast groups	224.0.50.80-90 224.0.29.88-95	224.0.50.208-218 224.0.30.88-95	59500	59532
	Source networks	193.29.89.192/28	193.29.89.208/28	-	

The following multicast groups and ports are used for the EEX MDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.50.66	224.0.50.194	59000	59032
	Source networks	193.29.91.192/28	193.29.91.208/28	-	
Simulation	Multicast groups	224.0.50.82	224.0.50.210	59500	59532
	Source networks	193.29.89.192/28	193.29.89.208/28	-	

Due to the use of PIM Sparse Mode and any source multicast using IGMPv2 a rendezvous point for each multicast feed is required. The rendezvous points are as follows:

Environment	Rendezvous point Service A	Rendezvous point Service B
Production	193.29.91.252/32	193.29.91.253/32
Simulation	193.29.89.252/32	193.29.89.253/32

In addition to messages containing functional content, technical heartbeat messages (also called technical beacon messages) are sent out periodically on every multicast address. The purpose of the technical heartbeat message is to keep routing trees alive, i.e. this message prevents routers from dropping multicast packages. Eurex MDI sends the technical heartbeat messages on specific ports. The ports are listed in the table below.

Environment	Service A - technical heartbeat	Service B - technical heartbeat
Production	59086	59087
Simulation	59586	59587

6.1.4 Eurex Enhanced Market Data Interface (EMDI)

The Eurex Enhanced Market Data Interface provides un-netted price-level aggregated market data. Similar to the Eurex MDI, it is UDP based and disseminates market data from Eurex Exchange's T7 to participants over a multicast network.

As the un-netted market data consumes considerably more bandwidth, the bandwidth requirements for the Eurex EMDI are much higher than for the Eurex MDI. The required bandwidth depends primarily on the products market data must be delivered for.

Similar to the Eurex MDI, Eurex EMDI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Eurex MDI. Please note that in contrast to the Eurex MDI, the Eurex EMDI disseminates market data via service A for products configured on even partitions first and market data via service B for products on odd partitions first.

The following multicast group ranges and ports are used for the Eurex EMDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.50.0-63 224.0.29.0-63	224.0.50.128-191 224.0.30.0-63	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.91.0/27	193.29.91.32/27	-	
Simulation	Multicast groups	224.0.50.96-127 224.0.29.96-127	224.0.50.224-255 224.0.30.96-127	Snapshot: 59500 Incremental: 59501	Snapshot: 59532 Incremental: 59533
	Source networks	193.29.89.0/27	193.29.89.32/27	-	

The following multicast groups and ports are used for the EEX EMDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	Snapshot: 224.0.50.10 Incremental: 224.0.50.11	Snapshot: 224.0.50.138 Incremental: 224.0.50.139	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.91.0/27	193.29.91.32/27	-	
Simulation	Multicast groups	Snapshot: 224.0.50.106 Incremental: 224.0.50.107	Snapshot: 224.0.50.234 Incremental: 224.0.50.235	Snapshot: 59500 Incremental: 59501	Snapshot: 59532 Incremental: 59533
	Source networks	193.29.89.0/27	193.29.89.32/27	-	

For the highest degree of flexibility in subscribing market data and to enable an optimal bandwidth utilization, snapshot and incremental data is disseminated via different multicast groups.

Eurex EMDI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to Eurex MDI. For details see chapter 6.1.3.

Please note that the rendezvous points for the Eurex EMDI multicast feeds are identical to those for the Eurex MDI, as listed in chapter 6.1.3.

6.1.5 Eurex Enhanced Order Book Interface (EOBI)

The Eurex Enhanced Order Book Interface (Eurex EOBI) provides the entire visible order book, by publishing information on each individual order and quote side, along with executions and state information in real-time and in an un-netted manner. The Eurex EOBI interface is available for a selected group of Eurex benchmark Futures products, and provides an additional alternative to recipients of the Eurex Enhanced Market Data Interface (Eurex EMDI). In production the Eurex EOBI interface is available exclusively via 10 Gbit/s connections. In simulation Eurex EOBI will be offered not only via 10 Gbit/s connections but additionally via 1 Gbit/s connections, which allow access from non-proximity sites.

Similar to the Eurex MDI, Eurex EOBI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Eurex MDI. Please note that in contrast to the Eurex MDI, the Eurex EOBI disseminates market data via service A for products configured on even partitions first and market data via service B for products on odd partitions first.

The following multicast group ranges and ports are used for the Eurex EOBI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.114.32-63 224.0.114.144-159	224.0.114.64-95 224.0.114.160-175	Snapshot: 59000 Incremental: 59001	Snapshot 59032 Incremental: 59033
	Source networks	193.29.88.64/27 193.29.91.0/27	193.29.88.96/27 193.29.91.32/27		
Simulation	Multicast groups	224.0.114.96-111 224.0.114.176-191	224.0.114.112-127 224.0.114.192-207	Snapshot: 59500 Incremental: 59501	Snapshot: 59532 Incremental: 59533
	Source networks	193.29.89.0/27	193.29.89.32/27		

For the highest degree of flexibility in subscribing market data and to enable an optimal bandwidth utilization, snapshot and incremental data is disseminated via different multicast groups.

Eurex EOBI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to Eurex MDI. For details see chapter 6.1.3.

Due to the internal configuration of Eurex EOBI, market data can originate from one of two source networks. The dissemination of EOBI market data for a particular product will only originate from one of the source networks and will remain constant throughout the trading day

Please note that the rendezvous points for the Eurex EOBI multicast feeds are identical to those for the Eurex MDI, as listed in chapter 6.1.3.

6.1.6 Eurex Extended Market Data Service (EMDS)

The Eurex Extended Market Data Service provides Ticker data, Eurex Off-book trade prices, settlement prices and intraday open interest information. Similar to the Eurex EMDI and Eurex MDI, it is UDP based and disseminates the respective data to participants over a multicast network.

The Eurex Off-book trade price, settlement price and open interest information is disseminated in three separate multicast groups whereby each stream receives a separate multicast address.

Similar to the Eurex MDI and Eurex EMDI, the Eurex Extended Market Data Service provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Eurex MDI and Eurex EMDI.

The following multicast groups and ports are used for the Eurex Extended Market Data Service:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast group: Ticker Feed	224.0.50.75	224.0.50.203	59000 Replay: 59001	59032 Replay: 59033
	Multicast group: Settlement prices	224.0.50.77	224.0.50.205		
	Multicast group: Intraday open Interest data	224.0.50.78	224.0.50.206		
	Multicast group: On-exchange and Off-book trade prices	224.0.50.79	224.0.50.207		
	<Reserved for future usage:>	224.0.29.64-71	224.0.30.64-71	Replay only: 59001	Replay only:59033
	Source networks	193.29.91.192/28	193.29.91.208/28		
	Multicast group: Ticker Feed	224.0.50.91	224.0.50.219	-	

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Simulation	Multicast group: Eurex Off-book trade prices	224.0.50.92	224.0.50.220	59500 Replay: 59501	59532 Replay: 59533
	Multicast group: Settlement prices	224.0.50.93	224.0.50.221		
	Multicast group: Intraday open Interest data	224.0.50.94	224.0.50.222		
	Multicast group: On-exchange trade prices	224.0.50.95	224.0.50.223		
	<Reserved for future usage:>	224.0.29.80-87	224.0.30.80-87	Replay only: 59501	Replay only: 59533
	Source networks	193.29.89.192/28	193.29.89.208/28		
				-	

Please note that the rendezvous points for the Eurex Extended Market Data Service multicast feeds are identical to those for the Eurex MDI, as listed in chapter 6.1.3.

6.1.7 Eurex Market Signals

Eurex Market Signals are key figures calculated in real-time which can optionally be received via a Multi Interface Channel (MIC) or 10Gbit/s market data connection in co-colocation. Eurex Market Signals are intended to support Exchange participants in their trading decisions. For more information, please refer to the separate Eurex Market Signals document which is available on the Eurex website.

Similar to the Eurex MDI, Eurex EMDI and the Eurex Extended Market Data Service, Eurex Market Signals data is also disseminated via a "live-live" concept with two services, A and B. As a result, the same rules apply as for the other feeds.

The following multicast groups and ports are used for the Eurex Market Signals:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Reference Data	224.0.114.1	224.0.114.9	59000	-
	Eurex IOC Liquidity Indicator for Options	224.0.114.128	224.0.114.130	59001	59033
	Intraday Volatility Forecast	224.0.114.132	224.0.114.136	59001	59033
	Risk Alerts	224.0.114.134	224.0.114.138	59001	59033
Simulation	Reference Data	224.0.114.17	224.0.114.25	59500	--
	Eurex IOC Liquidity Indicator for Options	224.0.114.129	224.0.114.131	59501	59533
	Intraday Volatility Forecast	224.0.114.133	224.0.114.137	59501	59533
	Risk Alerts	224.0.0.114.135	224.0.114.139	59501	59533

The Eurex Market Signals Multicast addresses use the same source networks and rendezvous points as for Eurex EMDI. Participants should however be aware that for existing installations, the multicast group to rendezvous point definitions (typically an Access Control List) will need to be expanded.

6.1.8 Eurex and EEX Reference Data Interface (RDI)

Eurex Exchange's T7 offers an interface dedicated to reference data, the Eurex RDI. The Eurex RDI provides reference data for instruments that are available for trading on T7 and delivers data on a product and instrument level. Every tradable object is referenced by a unique identifier. In addition, the data delivered contains the technical configuration, e.g. multicast group and port combinations for both market data interfaces for all products and instruments.

Please note: The multicast group (address) and port combinations per product must be processed every day, as this assignment is subject to change on a daily basis.

The Eurex RDI delivers reference data in message format. Similar to the Eurex EMDI, the interface is multicast based. As the Eurex MDI and Eurex EMDI, the Eurex RDI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Eurex MDI and Eurex EMDI.

Multicast groups and ports for the reference data feeds do not change during trading hours.

The following multicast groups and ports are used for the Eurex RDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports
Production	Multicast groups: Snapshot data	224.0.50.0	224.0.50.128	59098
	Multicast groups: Incremental data	224.0.50.1	224.0.50.129	59099
	Source networks	193.29.91.192/28	193.29.91.208/28	-
Simulation	Multicast groups: Snapshot data	224.0.50.96	224.0.50.224	59598
	Multicast groups: Incremental data	224.0.50.97	224.0.50.225	59599
	Source networks	193.29.89.192/28	193.29.89.208/28	-

The following multicast groups and ports are used for the EEX RDI:

Environment	Description	Multicast groups Service A	Multicast groups Service B	Ports
Production	Multicast groups: Snapshot data	224.0.29.0	224.0.30.0	59098
	Multicast groups: Incremental data	224.0.29.1	224.0.30.1	59099
	Source networks	193.29.91.192/28	193.29.91.208/28	-
Simulation	Multicast groups: Snapshot data	224.0.29.96	224.0.30.96	59598
	Multicast groups: Incremental data	224.0.29.97	224.0.30.97	59599
	Source networks	193.29.89.192/28	193.29.89.208/28	-

For the highest degree of flexibility in subscribing reference data, snapshot and incremental data is disseminated via different multicast groups.

Eurex RDI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to Eurex MDI. For details see chapter 6.1.3.

Please note that the rendezvous points for the Eurex RDI multicast feeds are identical to those for the Eurex MDI, as listed in chapter 6.1.3.

6.1.9 Eurex Admin GUI and Eurex Trader GUI

There are two graphical user interfaces available for Eurex Exchange's T7:

- The Eurex Trader GUI for on-exchange trading and Eurex trade entry service.
- The Eurex Admin GUI for user maintenance, maintenance of entitlements and Transaction Size Limits (TSL) on user/trader level. The Eurex Admin GUI is always provided within a MIC, even if GUI Channel is configured on the same line.

Both GUIs can be accessed via leased line connections or alternatively through the Internet (Native Internet connection). The T7 GUI solution relies on Oracle/Sun Java WebStart technology for the delivery of the software to the participant. The necessity for the deployment of software kits and installation on the participant's side is obsolete.

Access to the following servers is necessary in order to access the T7 GUI solution. This affects the setup of the network firewall from a customer point of view:

1. Access to the dedicated GUI webpage and the Java WebStart server behind is required to download the Java applet (JAR file).
2. Access to the crypto proxy server (for Internet) or the proxy server (for leased lines) is required to access Eurex via the Eurex Trader GUI and Eurex Admin GUI.

6.1.9.1 Access to the GUI webpage

To initiate the Java WebStart process a state-of-the-art web browser needs to be started to access the dedicated GUI webpage, which can be reached by the URL addresses provided in the tables below.

Clicking on the link "Eurex Trader GUI" initiates the Java WebStart mechanism to download the GUI Java applet (JAR file) from the WebStart server. Java WebStart verifies if the current version of the GUI is already present in the local cache of the participant's client computer.

If the latest version has already been downloaded during a previous launch, the cached version is used with no download being necessary. If a newer version is available on the WebStart server, then it will be downloaded automatically and stored in the cache to be used in the future.

Browsing to the GUI webpage is based on TCP/IP on port 80. The following addresses are used for Internet or leased line connections:

GUI webpage

Connection option	URL / IP addresses	Ports	Protocol
Internet	*http://webgui.eurexchange.com*	80	TCP/IP
Leased line	*http://193.29.93.173*	80	TCP/IP

Transferring the JAR file via Java Web Start is based on TCP/IP on port 80 or port 443 (SSL). To serve that purpose, two sets of Java Web Start servers are used: one for Internet and one for leased line connections.

Java Web Start Server

Connection option	IP addresses	IP subnets	Ports	Protocol
Internet	193.29.90.190	n/a	80 / 443	TCP/IP
Leased line	193.29.93.173	193.29.93.160/28	80 / 443	TCP/IP

As the Eurex Java Web Start server only has one common source IP subnet for both sides (lines), customers with dual connectivity to Eurex should consider the use of a redundant gateway protocol such as Cisco's HSRP or VRRP functionality in the participant LAN for the IP gateway address to the above network, to ensure connectivity in the case of a participant router failure.

6.1.9.2 Access to the Eurex proxy servers

Once the GUI application has been started within the local Java Virtual Machine, the following network communication between the client computer and the receiving Eurex proxy servers will be used for further communication:

Environment	Connection option	IP addresses	IP subnets	Ports: Eurex Trader GUI	Ports: Eurex Admin GUI	Protocol
Production	Internet	193.29.90.203 193.29.90.204	193.29.90.192/27	80	80	TCP/IP
	Leased line - side A	193.29.91.225 193.29.91.226	193.29.91.224/28	8089	80	TCP/IP
	Leased line - side B	193.29.93.225 193.29.93.226	193.29.93.224/28			
Simulation	Internet	193.29.90.235 193.29.90.236	193.29.90.224/27	80	80	TCP/IP
	Leased line - side	193.29.89.22	193.29.89.224/2	8089	80	TCP/IP

Environment	Connection option	IP addresses	IP subnets	Ports: Eurex Trader GUI	Ports: Eurex Admin GUI	Protocol
	A	5	8			
	Leased line - side B	193.29.95.225	193.29.95.224/28			

If a firewall is used, the ports above must be configured. For load balancing reasons the subnets with possible proxy IP addresses are listed. Potential firewalls should allow traffic to the specified subnets.

Please note that the GUI applications encrypt the data sent over the Internet. Although port 80 is used, firewalls will not be able to read the content (payload) of the TCP/IP packets sent on this port.

For encryption and authentication a SSH-2 key pair has to be created and the public key has to be uploaded to Eurex via the web portal in the Member Section under *member.eurexchange.com*. Please consult the GUI manual for further details on SSH-2 key pair creation and upload.

If traffic of the participant is sent through local proxy servers, the proxy server's details need to be configured within the login screen of the GUI. Please consult the GUI manual for further details on how to configure the GUI for Internet usage via local proxy servers.

For leased lines connections the local IP-address for GUI connections is expected to be within the assigned participant LAN.

Technical implementation can be done by placing a proxy server in the participant LAN, taking on one side the connections to the trading desks, and on the other side residing in the assigned participant LAN. Alternatively, Network Address Translation (NAT) protocols can be implemented in the trading participant's network to shield the in-house networks and translate them to addresses in the assigned participant LAN.

6.2 Eurex Clearing interfaces

The following chapter contains the relevant information regarding ports and IP addresses for the Eurex Clearing interfaces.

- The **Eurex Clearing FIXML Interface** provides a highly flexible, standards-compliant and cost-effective interface that allows Eurex participants to perform post-trade modifications and allows Eurex Clearing members to perform their clearing responsibilities.
- The **Eurex Clearing FpML Interface** provides EurexOTC Clear participants with a highly flexible way of entering and modifying their EurexOTC Clear trades.
- The **EurexOTC Clear Margin Calculator API** allows the members to assess the impact of simulated trades on their margin requirement for EurexOTC Clear.
- The **Enhanced Risk Solution** provides Eurex Clearing members (general clearer and direct clearers) with a near-time risk data distribution service.
- **WebTrading** offers access to the @X-tract GUI which is still needed to perform post-trade modifications and clearing responsibilities for a limited period of time.
- The C7 **Derivatives Clearing GUI**, the **EurexOTC Clear GUI**, the **EurexOTC Clear Margin Calculator GUI** and the **Securities Clearing GUI** allow access to the respective services offered by Eurex Clearing.

In order to access one of these interfaces, a certificate needs to be generated and its public key needs to be uploaded into the Member Section of Eurex Clearing at member.eurexclearing.com. Please refer to the documentation of the corresponding interface about instructions for the certificate generation procedure. The private key of the generated certificate needs then to be used by the corresponding application. For the WebTrading service, Eurex Clearing will generate a user-bound certificate which can be ordered in the Member Section of Eurex Clearing at member.eurexclearing.com.

As the Eurex Clearing FIXML Interface, the Eurex Clearing FpML Interface, the Enhanced Risk Solution, the EurexOTC Clear Margin Calculator API or the Eurex Clearing GUI infrastructure have only one common source IP subnet for both data centers, participants with dual connectivity to Deutsche Börse should be aware that the use of Dynamic NATing on their Cisco Edge router towards Deutsche Börse may lead to connection difficulties resulting from asymmetrical routing.

If this is the case, participants have to adjust the routing metrics in such a way that symmetrical routing is ensured. Also, with dual connectivity to Deutsche Börse, the use of Cisco's HSRP functionality in the participant LAN for the IP gateway address to the new networks should be considered. In this way, connectivity in the event of a participant router failure can be ensured.

Please note: In order to access the WebSphere MQ infrastructure of the Eurex Clearing FIXML Interface, Eurex Clearing FpML Interface or the EurexOTC Clear Margin Calculator API, a z/OS channel is required. Please contact your TKAM for further details.

6.2.1 Eurex Clearing FIXML Interface

The following IP addresses and ports must be used for the connection to the Eurex Clearing FIXML Interface:

Environment	IP addresses	IP subnets	Ports	Protocol
Production	90.162.253.100	90.162.253.0/24	10070	TCP/IP
Simulation	90.162.253.101	90.162.253.0/24	10170	TCP/IP

The Eurex Clearing FIXML Interface uses server certificates signed by a trusted Certificate Authority (CA). The public keys of the server certificates must be downloaded once from the Eurex website www.eurexclearing.com. These certificates are available under the following path:

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

The certificates of the root CA signing the server certificates can be downloaded from:

https://www.verisign.com/support/verisign-intermediate-ca/secure-site-intermediate/index.html

6.2.2 Eurex Enhanced Risk Solution Interface

The following IP addresses and ports must be used for the connection to the Enhanced Risk Solution:

Environment	IP addresses	IP subnets	Ports	Protocol
Production	90.164.253.100	90.164.253.0/24	18080	TCP/IP
Simulation	90.164.253.101	90.164.253.0/24	18181	TCP/IP

The Enhanced Risk Solution uses server certificates signed by a trusted Certificate Authority (CA). The public keys of the server certificates must be downloaded once from the Eurex website www.eurexclearing.com. These certificates are available under the following path:

www.eurexclearing.com -> Technology -> Eurex Clearing classic system -> System documentation.

The certificates of the root CA signing the server certificates can be downloaded from:

https://www.verisign.com/support/verisign-intermediate-ca/secure-site-intermediate/index.html.

6.2.3 Eurex Clearing FpML Interface

The following IP addresses and ports must be used for the connection to the Eurex Clearing FpML Interface:

Environment	IP addresses	IP subnets	Ports	Protocol
Production	90.162.253.110	90.162.253.0/24	18475	TCP/IP
Simulation	90.162.253.111	90.162.253.0/24	18575	TCP/IP

The Eurex Clearing FpML Interface uses server certificates signed by a trusted Certificate Authority (CA). The public keys of the server certificates must be downloaded once from the Member Section of the Eurex Clearing website member.eurexclearing.com. These certificates are available under the following path using https:

member.eurexclearing.com -> Clearing Resources -> Releases -> EurexOTC Clear -> Interest Rate Swaps -> IRS Release 3.0 -> Interfaces -> Eurex Clearing FpML Interface.

The certificates of the root CA signing the server certificates can be downloaded from:

https://www.verisign.com/support/verisign-intermediate-ca/secure-site-intermediate/index.html

6.2.4 EurexOTC Clear Margin Calculator API

The following IP addresses and ports must be used for the connection to the EurexOTC Clear Margin Calculator API:

Environment	IP addresses	IP subnets	Ports	Protocol
Production	90.164.253.110	90.164.253.0/24	18475	TCP/IP
Simulation	90.164.253.111	90.164.253.0/24	18575	TCP/IP

The OTC Clear Margin Calculator API uses server certificates signed by a trusted Certificate Authority (CA). The public keys of the server certificates must be downloaded once from the Member Section of the Eurex Clearing website member.eurexclearing.com. These certificates are available under the following path using https:

member.eurexclearing.com -> Clearing Resources -> Releases -> EurexOTC Clear -> Interest Rate Swaps -> IRS Release 3.0 -> Interfaces -> Eurex Clearing FpML Interface.

The certificates of the root CA signing the server certificates can be downloaded from:

https://www.verisign.com/support/verisign-intermediate-ca/secure-site-intermediate/index.html

6.2.5 Eurex Clearing GUIs

In order to access the Eurex Clearing GUIs, a state-of-the-art web-browser is needed. In order to access the @X-tract GUI, which is available only with the WebTrading service, either a Citrix plug-in or Java needs to be installed.

Access to the Eurex Clearing GUIs is possible through an internet connection or through a leased line connection. Accessing the Eurex Clearing GUIs using leased line requires a GUI Channel. Please refer to chapter 5.3 for further details about a GUI Channel.

In order to use WebTrading, a user-bound certificate needs to be ordered in the Member Section of Eurex Clearing at member.eurexclearing.com. Eurex Clearing will then generate the corresponding certificate which then can be downloaded from the Member Section. This certificate is password protected and needs to be imported into the browser.

In order to access the C7 Derivatives Clearing GUI, EurexOTC Clear GUI, the EurexOTC Clear Margin Calculator GUI or the Securities Clearing GUI, a certificate needs to be generated and its public key needs to be uploaded into the Member Section of Eurex Clearing at member.eurexclearing.com. For instructions about the certificate generation process, please refer to the Clearing GUIs Access Guide which is available for download on the Eurex Clearing website at

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

6.2.5.1 WebTrading

WebTrading offers access to the @X-tract GUI. Deutsche Börse as the technical provider of the WebTrading service offered authentication via token until July 2013. Since then, certificates for authentication purposes are generated and provided. Existing tokens for authentication purposes are still supported and should be used until there is a need to migrate to certificates.

Tokens allow accessing the WebTrading infrastructure via internet only. Certificates can be used to access the WebTrading infrastructure via internet and via leased lines. Access via leased line and via internet is possible using the same certificate.

WebTrading is using the same URL for the Production and Simulation environments.

The following table shows the connection details for connecting to the WebTrading service via internet using tokens.

URL	Port	Protocol
https://webtrading.deutsche-boerse.com	443/tcp	https

The following table shows the connection details for connecting to the WebTrading service via internet using certificates.

URL	Port	Protocol
https://webtrading-cert.deutsche-boerse.com	443/tcp	https

The following table shows the connection details for connecting to the WebTrading service via leased line using certificates.

URL	IP Address	Port	Protocol
https://webtrading-line.deutsche-boerse.com	193.29.93.177	443/tcp	https

Please note for connections via leased line: In order to allow a success handshake of the ssl-protocol, the Citrix server certificate needs to be verified by the browser. This means that the hostname webtrading-line.deutsche-boerse.com and the corresponding IP address need to be known to the browser. For certificate access via internet and for token access, this is done automatically using the name resolution of the internet name servers of Deutsche Börse Group. However, this fails for leased lines. Therefore, this name resolution needs to be configured in the Member network, e.g. in the local /etc/hosts file or in the member name-server.

6.2.5.2 C7 Derivatives Clearing GUI

In order to access the C7 Derivatives Clearing GUI, a certificate needs to be generated and uploaded into the Member Section. The same certificates can be used to access the C7 Derivatives Clearing GUI infrastructure via internet or via leased line. For instructions about the certificate generation process, please refer to the Clearing GUIs Access Guide which is available for download on the Eurex Clearing website at

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

The following table shows the connection details for connecting to the Derivatives Clearing GUI via internet:

Environment	URL	Ports
Production	https://production.eurexclearing.com:8443/C7_GUI/	8443/tcp
Simulation	https://simulation.eurexclearing.com:9443/C7_GUI/	9443/tcp

The following table shows the connection details for connecting to the Derivatives Clearing GUI via leased line:

Environment	URL	IP Address	Ports
Production	https://production.vpn.eurexclearing.com:8443/C7_GUI/	193.29.93.171	8443/tcp
Simulation	https://simulation.vpn.eurexclearing.com:9443/C7_GUI/	193.29.93.172	9443/tcp

6.2.5.3 EurexOTC Clear GUI

In order to access the EurexOTC Clear GUI, a certificate needs to be generated and uploaded into the Member Section. The same certificates can be used to access the EurexOTC Clear GUI infrastructure via internet or via leased line. For instructions about the certificate generation process, please refer to the Clearing GUIs Access Guide which is available for download on the Eurex Clearing website at

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

The following table shows the connection details for connecting to the EurexOTC Clear GUI via internet:

Environment	URL	Ports
Production	*https://production.eurexclearing.com:8443/OTC_GUI/*	8443/tcp
Simulation	*https://simulation.eurexclearing.com:9443/OTC_GUI/*	9443/tcp

The following table shows the connection details for connecting to the EurexOTC Clear GUI via leased line:

Environment	URL	IP Address	Ports
Production	*https://production.vpn.eurexclearing.com:8443/OTC_GUI/*	193.29.93.171	8443/tcp
Simulation	*https://simulation.vpn.eurexclearing.com:9443/OTC_GUI/*	193.29.93.172	9443/tcp

6.2.5.4 EurexOTC Clear Margin Calculator GUI

In order to access the EurexOTC Clear Margin Calculator GUI, a certificate needs to be generated and uploaded into the Member Section. The same certificates can be used to access the EurexOTC Clear Margin Calculator GUI infrastructure via internet or via leased line. For instructions about the certificate generation process, please refer to the Clearing GUIs Access Guide which is available for download on the Eurex Clearing website at

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

The following table shows the connection details for connecting to the EurexOTC Clear Margin Calculator GUI via internet:

Environment	URL	Ports
Production	*https://production.eurexclearing.com:8443/Margin_Calculator/*	8443/tcp
Simulation	*https://simulation.eurexclearing.com:9443/Margin_Calculator/*	9443/tcp

The following table shows the connection details for connecting to the EurexOTC Clear Margin Calculator GUI via leased line:

Environment	URL	IP Address	Ports
Production	*https://production.vpn.eurexclearing.com:8443/Margin_Calculator/*	193.29.93.171	8443/tcp
Simulation	*https://simulation.vpn.eurexclearing.com:9443/Margin_Calculator/*	193.29.93.172	9443/tcp

6.2.5.5 Securities Clearing GUI

In order to access the Margin Calculator, a certificate needs to be generated and uploaded into the Member Section. The same certificates can be used to access the Securities Clearing GUI infrastructure via internet or via leased line. For instructions about the certificate generation process, please refer to the Clearing GUIs Access Guide which is available for download on the Eurex Clearing website at

www.eurexclearing.com -> Technology -> Eurex Clearing's C7 -> System documentation.

The following table shows the connection details for connecting to the Securities Clearing GUI via internet:

Environment	URL	Ports
Production	*https://production.eurexclearing.com:8443/LOGIN_GUI/*	8443/tcp
Simulation	*https://simulation.eurexclearing.com:9443/LOGIN_GUI/*	9443/tcp

The following table shows the connection details for connecting to the Securities Clearing GUI via leased line:

Environment	URL	IP Address	Ports
Production	*https://production.vpn.eurexclearing.com:8443/LOGIN_GUI/*	193.29.93.171	8443/tcp
Simulation	*https://simulation.vpn.eurexclearing.com:9443/LOGIN_GUI/*	193.29.93.172	9443/tcp

6.3 Common Report Engine

The Common Report Engine is the sole source for end-of day trading reports and files.

The Common Report Engine is an FTP server that can be accessed using the Secure File Transfer Protocol (SFTP) from the SSH-suite. Access to the Common Report Engine is either possible via leased lines or via the Internet (Native Internet Access).

A connection to the Common Report Engine can be established with the following parameters:

Connection option*	Gateway IP addresses	IP subnets	Ports: Participant area	Ports: Public area	Protocol
Internet	193.29.90.129	n/a	2222	2221	TCP/IP
Leased line - side A	193.29.90.65	193.29.90.64/27			
Leased line - side B	193.29.90.97	193.29.90.96/27			

* Leased lines connecting to Access Points in Singapore and Hong Kong as well as iAccess connections do not provide connectivity to the Common Report Engine. Native Internet access should be used instead.

Please note that the bandwidth on a leased line available for the Common Report Engine is determined by the configured MIC itself.

6.4 Eurex Repo's F7 Interfaces

Both, the browser based GUI and the F7 API can connect to Eurex Repo's F7 system either via leased line or via Internet.

In either case client authentication will be done by using x.509 certificates. The certificate will be used to encrypt all data transmitted between the browser based GUI or any third party application.

6.4.1 Eurex Repo's F7 Trading GUI

Eurex Repo's F7 GUI can be accessed via links or URLs. These URLs differ based on the type of connection (Leased line vs. Internet) and based on the environment (Production vs. Simulation).

Any of these four URLs can be placed in the bookmarks of the user's browser, or placed as links on the desktop.

Environment	Type	URL
Simulation	Leased Line	https://simulation.vpn.eurexrepo.com:9443/TRADING_GUI
	Internet	https://simulation.eurexrepo.com:9443/TRADING_GUI
Production	Leased Line	https://production.vpn.eurexrepo.com:8443/TRADING_GUI
	Internet	https://production.eurexrepo.com:8443/TRADING_GUI

6.4.2 Eurex Repo's F7 API

The F7 API connection gateways are accessed via direct IP addresses. These IP addresses differ based on the type of connection (Leased line vs. Internet) and based on the environment (Production vs. Simulation).

Environment	Type	IP Address	Port
Simulation	Leased Line	193.29.95.217	11575
	Internet	193.29.90.166	11575
Production	Leased Line	193.29.95.218	11475
	Internet	193.29.90.167	11475

7. Router hard- and software recommendations

The following sections deal with router recommendations for the different types of connections. All routers must be capable of handling multicast.

7.1 E1 and T1 participant connections

E1 and T1 participant connections ordered by Eurex are presented with a RJ45 jack (balanced - 120Ω impedance) and the pin layout 1, 2; 4, 5. In case a RJ45 jack cannot be provided by the carrier, a BNC jack (unbalanced - 75Ω impedance) will be provided. In this case, a BALUN could be necessary on the participant side to match the router interface impedance and the leased line impedance. Please refer to the table below.

Cisco E1 cards VWIC-1MFT-E1 and VWIC-2MFT-E1 are not supported, as they do not support clear channel E1 connections.

The following devices have been tested for E1 and T1 connections:

Device type	Tested software version
2811, 2821, 2851	12.3(8)T, 12.4(20)T
2911, 2921, 2951	15.0(1)M1, 15.4(1)T3
3825, 3845	12.3(11)T, 12.4(20)T
3925, 3945	15.0(1)M1

7.2 iAccess participant connections

The following devices have been tested for iAccess connections:

Device type	Tested software version
2811, 2821, 2851	12.3(8)T, 12.4(20)T
2911, 2921, 2951	15.0(1)M1, 15.4(1)T3
3825, 3845	12.3(11)T, 12.4(20)T
3925, 3945	15.0(1)M1

Please note that the router for iAccess must have a software image that supports IPSEC/AES.

7.3 Ethernet connections with Multicast

If Deutsche Börse multicast services are transmitted and if the activated overall bandwidth on Deutsche Börse leased line(s) provide the applicable bandwidth, the following layer 3 networks equipment may be used by participants.

The devices were tested without additional features such as NAT or QoS, and only with single multicast replication.

7.3.1 Leased lines with up to 10 Mbit/s Multicast configured

Device type	Tested software version
2811, 2821, 2851	12.3(8)T, 12.4(20)T
2901, 2911	15.0(1) M1, 15.4(1)T3
3825 or 3845	12.3(11)T, 12.4(20)T

7.3.2 Leased lines with up to 100 Mbit/s Multicast configured

Device type	Tested software version
2951	15.0(1) M1, 15.4(1)T3
3925 or 3945	15.0(1) M1

7.3.3 Leased lines with up to 1000 Mbit/s Multicast configured

Device type	Tested software version
ASR 1002, 1004 or 1006	12.2.(33)XNA1, 15.1(3)S1, 15.4(3)2a
4948	12.2(46)SG
4900M	12.2.(46)SG, 12.2(54)SG
Catalyst 6500 with sup 720	12.2(33)SXI8, 15.1(2)SY2
Nexus 3064	Not yet tested
7600	12.2 (33) SRD2, 15.3(3)S2

8. Appendix

8.1 Contact information

Overview of contact information	
Website for T7	*www.eurexchange.com*
Website for Eurex Clearing	*www.eurexclearing.com*
Website for F7	www.eurexrepo.com
Member services & admission	+49-(0)69-211-11700
Eurex customer technical support	Please contact your dedicated Technical Account Manager by using your VIP telephone number or via email: cts@deutsche-boerse.com

8.2 Sources of information

For further information concerning the Eurex interfaces, as described in chapter 6, please visit the Eurex website (*www.eurexchange.com*) and the Eurex Clearing website (*www.eurexclaring.com*). The websites provide documents, such as circulars, functional and technical descriptions with additional pieces of information regarding participant-specific system configuration details.

The following table contains a list of references in regard to functional and technical documents.

Chapter reference or topic	What it is about	Link
Documentation for T7	Multiple topics	*www.eurexchange.com* > Technology
Documentation for Eurex Clearing	Multiple topics	*www.eurexclearing.com* > Technology
Documentation for Eurex Repo's F7	Multiple topics	www.eurexrepo.com > Technical Support

8.3 List of IP prefixes

IP prefixes (source IP networks, rendezvous points, etc.) are described in this document within the chapters of the respective interfaces. The following list merges all the IP prefixes relevant for leased line connections and advertised over both sides.

IP prefix	Description
Eurex ETI (chapter 6.1.1)	
193.29.91.128/27	IP subnet of Eurex ETI HF trading gateways, production, side A
193.29.91.64/27	IP subnet of Eurex ETI trading and connection gateways, production, side A
193.29.89.128/27	IP subnet of Eurex ETI HF trading gateways, simulation, side A
193.29.89.64/27	IP subnet of Eurex ETI trading and connection gateways, simulation, side A
193.29.91.160/27	IP subnet of Eurex ETI HF trading gateways, production, side B
193.29.91.96/27	IP subnet of Eurex ETI trading and connection gateways, production, side B
193.29.89.160/27	IP subnet of Eurex ETI HF trading gateways, simulation, side B
193.29.89.96/27	IP subnet of Eurex ETI trading and connection gateways, simulation, side B
Eurex FIX Gateway (chapter 6.1.2)	
90.150.253.0/24	IP subnet of Eurex FIX Gateways, production and simulation, side A
90.151.253.0/24	IP subnet of Eurex FIX Gateways, production and simulation, side B
Rendezvous points for Eurex MDI (chapter 6.1.3), Eurex EMDI (chapter 6.1.4), EUREX EOBI (chapter 6.1.5), Eurex RDI (chapter 6.1.8)	
193.29.91.252/32	Rendezvous point for service A, production
193.29.91.253/32	Rendezvous point for service B, production
193.29.89.252/32	Rendezvous point for service A, simulation
193.29.89.253/32	Rendezvous point for service B, simulation
Eurex MDI (chapter 6.1.3), Eurex Extended Market Data Service (chapter 6.1.6) and Eurex RDI (chapter 6.1.8)	
193.29.91.192/28	IP source network for service A, production

IP prefix	Description
193.29.91.208/28	IP source network for service B, production
193.29.89.192/28	IP source network for service A, simulation
193.29.89.208/28	IP source network for service B, simulation
Eurex EMDI (chapter 6.1.4)	
193.29.91.0/27	IP source network for service A, production
193.29.91.32/27	IP source network for service B, production
193.29.89.0/27	IP source network for service A, simulation
193.29.89.32/27	IP source network for service B, simulation
Eurex EOBI (chapter 6.1.5)	
193.29.88.64/27	IP source network for service A, production
193.29.88.96/27	IP source network for service B, production
193.29.89.0/27	IP source network for service A, simulation
193.29.89.32/27	IP source network for service B, simulation
Eurex Trader GUI and Eurex Admin GUI (chapter 0)	
193.29.93.160/28	IP subnet of Java Web Start server, production and simulation
193.29.91.224/28	IP subnet of Eurex proxy servers, production, side A
193.29.93.224/28	IP subnet of Eurex proxy servers, production, side B
193.29.89.224/28	IP subnet of Eurex proxy servers, simulation, side A
193.29.89.224/28	IP subnet of Eurex proxy servers, simulation, side B
Eurex Clearing GUIs (chapter 6.2.5)	
193.29.93.160/28	C7 Derivatives Clearing GUI, EurexOTC Clear GUI, EurexOTC Clear Margin Calculator and Securities Clearing GUI via leased line
Eurex WebTrading (chapter Fehler! Verweisquelle konnte nicht gefunden werden.**)**	

IP prefix	Description
193.29.93.176/29	Eurex WebTrading via leased line
Eurex Clearing FpML Interface (chapter 6.2.3)	
90.162.253.0/24	IP subnet, production and simulation
Eurex Clearing FIXML Interface (chapter 6.2.1)	
90.162.253.0/24	IP subnet, production and simulation
EurexOTC Clear Margin Calculator API (chapter 6.2.4)	
90.164.253.0/24	IP subnet, production and simulation
Enhanced Risk Solution (chapter 6.2.2)	
90.164.253.0/24	IP subnet, production and simulation
Common Report Engine (chapter 6.3)	
193.29.90.64/27	IP subnet, side A
193.29.90.96/27	IP subnet, side B
Eurex Repo's F7 Trading GUI (chapter 6.4.1)	
	IP subnet, production and simulation
	IP subnet, production and simulation
Eurex Repo's F7 API (chapter 6.4.2)	
	IP subnet, production and simulation
	IP subnet, production and simulation

9. Change log

The change log serves as a record of the latest major changes.

No	Date	Chapter, page	Change
1.0	18 July 2012	-	Creation of document
1.0.1	23 August 2012	6.1.1	Correction of one port number for Eurex ETI in production.
		6.1.7	Modification of IP addresses for GUI webpage and Java Web Start Server. Correction of port numbers and IP addresses for Eurex proxy servers.
1.0.2	10 Oct 2012	5.3	New chapter on the FTP Channel.
		6.1 – 6.3	Several tables modified for better readability.
		6.1.1	IP addresses of Eurex ETI gateways added.
		6.1.2	Side (1 and 2) information for IP subnet information and IP addresses added for Eurex FIX Gateway.
		6.1.7	IP subnet information added to table on Java Web Start server access; side (1 and 2) information and simulation IP addresses added to connection table for Eurex proxy servers.
		6.2.1	IP subnet information added to IP address table of Eurex Clearing FIXML Interface.
		6.2.3	IP addresses and IP subnets modified for Eurex FpML Interface following the single IP address scenario.
		6.3	Side (1 and 2) information added to IP subnet information and port for new public area of Common Report Engine added.
		8.3	New appendix: List of prefixes for leased line connections.
1.0.3	17 Dec 2012	6.1.2	Two additional IP addresses added for future use of the Eurex FIX Gateway.
		6.1.3, 6,1,4, 6.1.5	Ports for technical heartbeats in Eurex MDI, Eurex EMDI and Eurex RDI added.
		6.1.7.1	URL modified for GUI webpage via leased lines and Internet.
1.0.4	15 Jan 2013	6.1.4, 6.1.6	Reflecting the changes to multicast groups used for snapshot and incremental data, as introduced in circular 007/13

2.0.0	27.08.2013	General	Changed new trading architecture to T7
		General	Added C7
		General	Addition of EOBI
		General	Updated for T7 release 2.0
2.0.1	06.09.2013	6.1.3 / 6.1.6	Corrected Multicast group ranges for Eurex MDI and added the replay service to Eurex Extended Market Data Service chapter
2.0.3	21.10.2013	6.1.6	Added New Ticker Feed to Eurex Extended Market Data Service chapter
		6.1.4	Extended multicast address range for Eurex EMDI
		General	Fixed document version mismatch
2.0.4	28.10.2013 & 27.11.2013	6.1.5	Added TCP/IP ports for US restricted products
		6.1.5	Addition of two further source networks for the Eurex EOBI production feed
		6.1.6	Corrected Multicast group Service B of new ticker feed
		6.1.8.2	Added IP addresses of two further leased line proxy servers
2.0.5	24.01.2014	General	Added Clearing Interface Channel, Risk Data Channel and EurexOTC Clear Margin Calculator Interface
		4.1.2	Updated encryption for iAccess connections
		6.2.5.11	Network access information for the Securities Clearing GUI via leased line
2.0.6	11.02.2014	6.1.8.2	Correction of the second IP addresses for simulation access to the Eurex proxy servers
2.0.7	02.04.2014	6.2.5	Restructured chapter
		6.2.5.2	Added URL for the Derivatives Clearing GUI
2.0.8	17.07.2014	1	Added F7 API
		2.3	Added Repo's F7 Interface landscape
		4.1.1	Added Eurex Repo's F7 interfaces
		5.5	Added Eurex Repo's F7 Channel chapter
		6.4	Added Eurex Repo's F7 Interfaces chapter
		8.1/8.2	Added Eurex Repo resources

2.0.9	07.08.2014	6.1.3, 6.1.4, 6.1.6	Added additional values for multicast ranges used for the Enhanced Market Data Interface (EMDI), Market Data Interface (MDI) and Extended Market Data Services (EMDS).
2.0.10	06.10.2014	6.1.7	Addition of the multicast addresses for Eurex Market Signals.
2.0.11	01.09.2015	7.	Adaptions to Router hard- and software recommendations
2.0.12	06.09.2015	6.	Minor typing error corrections.
2.0.13	10.09.2015	6.1.7	Additional information about Eurex Market Signals.
2.0.14	02.10.2015	6.1.7	Update for Eurex Market Signals.
2.0.15	10.08.2016	6.1.5	Enhancement of the EOBI market data interface to include selected options (OKS2) and single stock futures.
2.0.15	16.08.2016	6.1.3	Addition of EEX MDI multicast addresses.
2.0.15	16.08.2016	6.1.4	Addition of EEX EMDI multicast addresses.
2.0.15	16.08.2016	6.1.8	Addition of EEX RDI multicast addresses.
2.0.15	24.08.2016	6.3.1	No FTP channel for Eurex MIC any more
2.0.15	24.08.2016	5.6	FTP Channel chapter removed
20.15	25.08.2016	5.0	Mention of FTP Channel removed.
20.15	23.11.2016	6.1.6.	Removed Off-book trade price MC Group