CEF® Network Requirements and Security to the CEF® Systems Connection Agreement of Deutsche Börse AG

Effective as of 10.11.2025

Content

Document 1: CEF® – N7 Network Access Guide

This document provides an overview of the CEF® network access to CEF® Core and CEF® ultra+ services.

Document 2: Extended Market Data Service

This document explains the Extended Market Data Service (EMDS) and Replay Service.

CEF® – N7® Network Access Guide

Version   1.9

Date   September 2025

List of abbreviations

The following list is limited to terminology and abbreviations, which are specific to CEF connections. 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 Deutsche Börse Group's systems.
Co-location	Co-location refers to the Equinix FR2 data center Deutsche Börse back-end infrastructure is hosted. Participants can rent rack space from Equinix in specific co-location rooms close to the back-ends of the Exchange.
Exchange	Exchange refers to the respective Deutsche Börse Group's back-end systems.
iAccess	iAccess is a point-to-point connection through the public Internet with an IPSec-encrypted tunnel
Installation	An installation reflects parts of the Deutsche Börse network (N7) and has a unique installation ID assigned. Not more than two identical services correspond to a unique installation. In case of CEF® Core TCP/IP services Deutsche Börse assigns a unique /24 network to an installation.
ISP	Internet Service Provider
Participant	A participant is a Market Data + Services (MD+S) customer/member
NetOps	Deutsche Börse Group Network Operations
Redundant	A redundant connection is a connection in which two identical services are provided via two leased lines having the same installation assigned and the same bandwidth allocated.
TKAM	Technical Account Manager of Deutsche Börse

Contact information

Overview of contact information	
Website of Market Data + Services	www.mds.deutsche-boerse.com
Data Services	data.services@deutsche-boerse.com
Deutsche Börse Customer Technical Support (CTS)	Please contact your dedicated Technical Key Account Manager by using your VIP telephone number or via email: cts@deutsche-boerse.com

Table of contents

1. Introduction

This document is primarily intended for network and system administrators. It provides an overview of the CEF® Core network access to CEF® Core services.

The document contains the required technical background information to gain network access, such as destination IP addresses and port numbers for the configuration of firewalls.

1.1 Network Overview

To support the respective CEF® Core services, Deutsche Börse Group has established an efficient infrastructure representing a dedicated global IP network. Access from a participant location to these services must always be established via the Deutsche Börse Group's IP network.

Any participant connection to the back-end systems is established via Access Points (AP). APs, to which leased lines connect are located throughout the world in major financial centers.

This concept allows Deutsche Börse Group to extend its private network up to the boundary of the respective carrier demarcation point 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 an VPN Internet connection (iAccess).

The N7 network consists of two separate networks halves (A and B site) allowing redundant connectivity (dual line options). Redundant connections are strongly recommended.

To separate services and to support Quality of Service (QoS) concepts for services running on a leased line or via an iAccess Internet VPN, Deutsche Börse uses a concept based on traffic shaping.

1.2 Network Security

Security is achieved by executing several measures, one of which is the AP, which is the sole gateway between back-end hosts and participant installations. Several participant installations connect 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 Deutsche Börse routers to ensure that the individual participants systems cannot communicate with each other across the network. The AP acts as a shield between the participant device and the back-end hosts.

As shown in Figure 1, if participant A tries to access the network of participant B, then the AP will prevent any kind of communication in that direction.

In addition, the AP will stop any kind of unauthorized access to the back-end. In the case of access via an iAccess connection, the participant is encouraged to use firewalls for additional security.

Figure 1: 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 network service.

2. Procedures and Responsibilities

The following chapter deals with the procedures and responsibilities with regard to getting connected to the CEF back-end hosts in the course of the connectivity process. Once a connection has been ordered participants are kindly asked for their cooperation in taking the necessary preparatory steps which are described below. The three major activities in the course of connectivity process necessary for the participant to take part in are:

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

Please contact your Technical Account Manager (TKAM) if you have any questions or comments with regards to the consulting call, the end-to-end test or the connection activation.

2.1 Consulting Call

All participants who wish to connect to CEF back-end hosts need to arrange a consulting call with their TKAM and take part in subsequent testing (end-to-end test and connection activation).

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

- the participant is made aware of the relevant documentation

- the connection activation 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.

2.2 End-to-End Test

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

- the leased line ordered by Deutsche Börse and the cross connect ordered by the participant has been physically cabled

- the respective participant's router WAN interface or equivalent can be reached from the corresponding Deutsche Börse AP

- 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 leased 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 test, e.g. presence of remote hands in data centers

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.

Please note: During an end-to-end test a Deutsche Börse Group NetOps staff member will open the AP router port temporarily. After an end-to-end test the port on Deutsche Börse side will be shut again.

2.3 Connection Activation

The prerequisites for running a connection activation 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 router WAN interface must have been configured on basis of the router configuration template provided in the course of the connectivity process and discussed in the consulting call

The goals of performing a connection activation are:

- to take the respective network service between the participant edge device and the Deutsche Börse AP edge device into operation

- check connectivity with regards to the new or changed infrastructure between the participant and the CEF® Core back-end hosts

- to activate network service monitoring

After a successful connection activation, the respective ports will stay open.

A connection activation is attended by:

- a Deutsche Börse Group NetOps staff member

- 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 activation to take place.

2.4 Network Administration and Responsibilities

The following table provides an overview of the respective responsibilities:

Role owner	Responsibilities	Definition
Deutsche Börse	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 boundary of the carrier demarcation point. (includes cross connects within co-location rooms)
Participant	Cross Connects	Applies to all leased line connections where Deutsche Börse delivers a leased line up to the boundary of the carrier demarcation point at the participant's site (and outside co-location rooms in Equinix FR2)
	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 CEF back-end hosts (e.g. routers, workstations and other participant devices at participant sites)
	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
Equinix as service provider	External co-location service	Rack space for the participant's hardware components in specific co-location rooms at Equinix FR2. Housing contracts are concluded between Equinix and the respective participant. Deutsche Börse Group is not involved in the contractual relation between its participants and Equinix.

3. Network Connectivity (N7)

This chapter provides an overview of the connectivity options enabling participants to gain access to CEF® Core back-ends hosts.

3.1 Connection Types

Two connection types are offered to participants: Leased line and iAccess based connections.

3.1.1 Leased Line

CEF® Core connections with a service-specific dedicated bandwidth based on physical leased lines are provided. The type and the bandwidth of the underlying network connection is determined at the discretion of the Deutsche Börse deciding whether line sharing is to be applied.

Deutsche Börse provides bandwidth on a leased line. All leased line connections requested by participants will be ordered by the Deutsche Börse.

Please note:

- 1 Gbit/s Ethernet connections in co-location are provided as Single-Mode-Fiber (SMF). These SMF connections shall terminate on a layer 3 device.

- Leased lines (Ethernet) are always delivered in full duplex mode.

3.1.2 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 CISCO router and an N7 Access Point.

Please note that only CEF® Core TCP/IP connections are offered via iAccess (not CEF® Core Multicast services). Concerning the iAccess bandwidth please be referred to the MD+S connection portfolio.

3.2 Connection Options

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

- Standard connection – Redundant leased line connection

- Combined connection - one leased line connection plus iAccess (CEF® Core TCP/IP only - the assigned network service, /24 MD/router LAN and bandwidth must be the same)

- Single leased line connection

- iAccess connection

The participant router is supposed to meet the Deutsche Börse router feature requirements.

3.2.1 Standard Connection- Redundant Leased Line Connection

The setup of two leased lines offers the highest availability of all connection options. 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 each of the 2 connections in separate locations (split location). Deutsche Börse assigns the same /24 private IP address range to both connections (applicable for CEF® Core TC/IP connections). The provision, operation and administration of the interconnection between both participant locations (routers) are within the participant's responsibility.

3.2.2 Combined Connection - One Leased Line plus iAccess

This solution offers high availability (applicable for CEF® Core TCP/IP only - the assigned network service and bandwidth must be the same). 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 Deutsche Börse.

Deutsche Börse 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). Deutsche Börse assigns the same /24 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 (please see below).

3.2.3 Single Leased Line Connection

The single leased line connection provides a basic connection to the Deutsche Börse CEF back-end hosts. As the single line option does not allow for a connection failover, single leased line connections are normally not intended for production purposes but may be suitable for disaster recovery and participant's backup locations. A single line does have only access to the CEF® Core infrastructure linked to the respective network half.

3.2.4 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 Deutsche Börse Access Point.

Technical implementation:

For iAccess connections the participant's infrastructure must meet the connection requirements listed below:

- The Internet connection is acquired, installed, configured, operated and maintained by the participant using an ISP his choice.

- The Internet connection bandwidth must meet the iAccess bandwidth requirements

- A static, registered public Internet IP of the customers' Internet Service Provider (ISP) must be provided to Deutsche Börse (DBAG) during the connectivity process as the Exchange can only accept connections from predetermined IP addresses

- BGP WAN peering requires the participant to run a router at his premise (firewalls are not supported).

- To use iAccess a participant is required to run a Cisco router meeting the feature requirements of Deutsche Börse

- GRE over IPSec (encrypted tunnel) with an AES 256 bit key and dh group 21 is applied.

- DBAG uses an authentication process with a Public Key Infrastructure (PKI) and will provide the certificate (during the connection activation the participant router would need to connect to http://193.29.78.250:10081/cgi-bin/pkiclient.exe to download the certificate). The participant's router must support the sha2 hashing algorithm. Pre-shared keys are not in use.

3.2.5 10 Gbit/s Connections within Co-location Rooms

Deutsche Börse offers dedicated 10 Gbit/s Ethernet connections (cross connects in co-location rooms in Equinix FR2) to provide latency-sensitive applications with the fastest possible connection to T7.

Please note: One cross-connect option can serve only one type of market and the respective reference 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:

Role owner	Responsibilities	Definition
Deutsche Börse	Port in T7	One 10 Gbit/s port, provided at a patch field
Equinix as service provider	External co-location service	Rack and cabinet space for the participant's hardware components
Participant	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

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 Deutsche Börse switch is established.

- Participants are free to use any hardware vendor. Deutsche Börse 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 market per fiber, i.e. either CEF Ultra+ Eurex or CEF Ultra+ Xetra T7 Market Data.

- No Quality of Service (QoS[1]) 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 Deutsche Börse 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)

- The logical interface must be configured in the subnet assigned by Deutsche Börse (participant LAN).

4. CEF® Core Network Overview

The CEF® application is three-tier client/server architecture.

Application Server - The major functions of the CEF® application servers are to send data, ensure fault tolerance where applicable and shield the host from direct access.

Access Point (AP) - APs are installed in different locations. Each AP consists of one or more routers connecting to the CEF® Core application servers and to the participant installations.

Member Device (MD) - The MD allows members to access the CEF® Core application server. The MD is connected to the Exchange via a WAN network (leased line and/or iAccess). The bandwidth of a specific service depends on the member's functional requirements. Please be referred to the MD+S connection portfolio.

---

[1] The DSCP (Differentiated Services) field in the IP header may be used to signal that a market data packet contains potential trigger information.

All components of the CEF® Core back–end setup redundantly (Exchange systems, APs). The Exchange recommends setting up the participant installation redundantly including the connections to the Deutsche Börse APs.

Participants are responsible for the purchase, installation, administration and operation of their CEF® Core installation including MDs and routers. In general, routers connecting MDs to APs should be used for CEF® exclusively. A decreasing availability or performance may occur if the routers are shared with other applications.

4.1 Member Device Network Setup

The topology of the CEF® Core network is strictly hierarchic and symmetric. The networks of the associated AP belong to different CEF® Core IP networks (network half A or B). For this reason, only static routes are used as routing mechanism on a MD with dynamic routing not to be configured. The recommended configuration consists of two networks, the MD/router network and the member network. The address space for the MD/router LAN is assigned by the Deutsche Börse. The member network belongs to address space to be assigned by the participant/member. The main goal of this solution is to separate the member and the Exchange networks. The member network could be built of any LAN/WAN technology and use any kind of protocol available on the market.

Figure 2: Network Setup – Relationship of MD and CEF® Application Server

Please note: UDP multicast is used for some CEF services e.g. CEF ultra+ Xetra and CEF Ultra+ Eurex. The MD has to use IGMPv2 for the communication with the first hop router, i.e. the AP router. Each member can choose whether a separate network for the respective WAN connection is

preferred. If one MD/router LAN segment is operated it is recommend to suppress the PIM neighborhood on the member LAN infrastructure for MDs connecting to CEF services provided by UDP multicast.

4.1.1 Connection of Member Device to the CEF® Core Application Server

No network failover is supported. Failover mechanism should be implemented in the member application. There is no network connection between the networks of CEF® Core application servers residing in the Deutsche Börse network 91.251.33.0 and 91.251.34.0.

Connectivity to one of these networks can only be established via the connection to the respective AP. In case a member has two MDs and two connections into both CEF® Core networks (see figure 2) each MD connects via a separate WAN connection to the according application servers. In case of failure of one CEF® Core component (server, router, WAN connection) the concerned MD is supposed to establish a connection via the corresponding other infrastructure (router, WAN connection and AP). This can be performed by manually triggering an application restart or by putting in place an application logic programmed by the participant/member. The relationship between router, WAN connection and AP can be found on the configuration sheet (please contact your TKAM if required). The static route(s) is/are to be entered according to this configuration sheet.

CEF® Core, CEF® Core (Structured Products) and CEF® Core Eurex in **Standard CEF-Format** host IP addresses and ports are:

CEF® Service	Environment	CEF® Data Feed 1	CEF® Data Feed 2	Port	
				Nagle on	**Nagle off**
CEF® Core	Production	91.251.33.10 (Prod) 91.251.33.11 (Prod)	91.251.34.10 (Prod) 91.251.34.11 (Prod)	51005	51004
CEF® Core	Simulation	91.251.33.14 (Sim) 91.251.33.13 (Rsim)	91.251.34.14 (Sim) 91.251.34.13 (RSim)	51005	51004
CEF® Core (Börse Frankfurt Zertifikate)	Production	91.251.33.30 (Prod)	91.251.34.30 (Prod)	51003	51002
CEF® Core (Börse Frankfurt Zertifikate)	Simulation	91.251.33.15 (Sim) 91.251.33.13 (RSim)	91.251.34.15 (Sim) 91.251.34.13 (RSim)	51003	51002
CEF® Core (Eurex)	Production	91.251.33.16 (Prod) 91.251.33.89 (Prod)	91.251.34.16 (Prod) 91.251.34.97 (Prod)	51007	51006
CEF® Core (Eurex)	Simulation	91.251.33.12 (Sim) 91.251.33.13 (Rsim)	91.251.34.12 (Sim) 91.251.34.13 (RSim)	51007	51006

CEF® Core APA **in Standard CEF-Format** host IP addresses and port are:

CEF® Service	Environment	CEF® Data Feed 1	CEF® Data Feed 2	Port	
				Nagle on	Nagle off
CEF® Core (Trax APA, BMV, Nodal)	Production	91.251.33.6 (Prod)	91.251.34.4 (Prod)	n/a	51008
CEF® Core (Trax APA, BMV, Nodal)	Simulation	91.251.33.5 (Sim) 91.251.33.13 (RSim)	91.251.34.5 (Sim) 91.251.34.13 (RSim)	n/a	51008

The equivalent of the CEF ultra+ Xetra respectively the CEF ultra+ Eurex network service is described in more detail in a separate document "N7 Network Access Guide".

4.1.2 Recovery Functionality

Recovery Functionality CEF® Core and CEF® ultra+Xetra

A TCP protocol is used for CEF® Core connections for sending application requests/responses between the Deutsche Börse AP and participant installation via a reliable communication link. The data feed CEF® ultra+ Xetra applies TCP for its Trade Recovery functionality as well.

The following table contains host IP addresses for the Production and Simulation environments for the trade recovery of CEF ultra+ Xetra feeds.

Environment	Type of Data Feed	IP Address	Port
Production	CEF Data Feed 1	91.251.33.40	55003
Production	CEF Data Feed 2	91.251.34.40	
Simulation	CEF Data Feed 1	91.251.33.41	55003
Simulation	CEF Data Feed 2	91.251.34.41	

Replay Service for CEF® ultra+ Eurex

An additional 'Replay Service' is provided for CEF® ultra+ Eurex which allows users to 'recover' from data loss for the following data items:

- Intraday Settlement prices,
- Open Interest data,
- Single and multi-leg EurexOTC trade prices and,
- On-exchange trades from the new Eurex trading architecture

Multicast Channels and Replay cycles are described in the document: 'Eurex extended market data service manual'.

5. CEF® Core Multicast

CEF® Core Multicast is the real-time data feed of Deutsche Börse - Market Data + Services produced by Deutsche Börse's (DBAG) data dissemination system (hereinafter referred to as the CEF® Core Multicast System) and covers real-time price and index data.

The CEF® Core Multicast feed is only available for contracting parties having their principal office in the Asia-Pacific region (i.e. China, North Korea, South Korea, Mongolia, Japan, Vietnam, Laos, Cambodia, Burma, Thailand, Malaysia, Singapore, Indonesia, East Timor, Philippines, Sri Lanka, Maldives, Pakistan, India, Bengal, Nepal, Bhutan, Sikkim, Papua Neuguinea and any successor state to those countries).

5.1 Multicast Addresses and Ports

5.1.1 Production Multicast Addresses and Ports

	ASIA_DBAG_INDEX (CEF Prod ID = 5613)	ASIA_EUREX (CEF Prod ID = 5618)
Delta Stream A	224.0.113.16	224.0.113.18
Snapshot Stream A	224.0.113.17	224.0.113.19
Delta Stream B	224.0.113.32	224.0.113.34
Snapshot Stream B	224.0.113.33	224.0.113.35
Multicast-Port	51011	51012

	ASIA_STOXX_INDEX (CEF Prod ID = 5615)	ASIA_SPOT (CEF Prod ID = 5616)
Delta Stream A	224.0.113.20	224.0.113.22
Snapshot Stream A	224.0.113.21	224.0.113.23
Delta Stream B	224.0.113.36	224.0.113.38
Snapshot Stream B	224.0.113.37	224.0.113.39
Multicast-Port	51013	51014

5.1.2   Simulation Multicast Addresses and Ports

	ASIA_DBAG_INDEX (CEF Prod ID = 5613)	ASIA_EUREX (CEF Prod ID = 5618)
Delta Stream A	224.0.113.24	224.0.113.26
Snapshot Stream A	224.0.113.25	224.0.113.27
Delta Stream B	224.0.113.40	224.0.113.42
Snapshot Stream B	224.0.113.41	224.0.113.43
Multicast-Port	51021	51022

	ASIA_STOXX_INDEX (CEF Prod ID = 5615)	ASIA_SPOT (CEF Prod ID = 5616)
Delta Stream A	224.0.113.28	224.0.113.30
Snapshot Stream A	224.0.113.29	224.0.113.31
Delta Stream B	224.0.113.44	224.0.113.46
Snapshot Stream B	224.0.113.45	224.0.113.47
Multicast-Port	51023	51024

5.2   Service Availability

Please note: The CEF® Core Multicast feed is only available for contracting parties having their principal office in the Asia-Pacific region. All time stamps are in CET / CEST.

Service	Service Description	Availability	Start	End
CEF® Core Multicast	**CEF® Core Multicast Service**	Service technical available	**00:01 am**	**11:50 pm**
		Service not available	**11:50 pm**	**00:01 am**

Product	Product Description	Data Availability	Start	End
ASIA_DBAG_INDEX (CEF Prod ID = 5613)	**DAX, MDAX, TecDAX and SDAX indices calculated based on Xetra instruments**	Listing Data	**06:30 am**	**06:30 am**
		Price Data	**09:00 am**	**05:45 pm**
		Daily Statistics Data	**06:30 pm**	**06:30 pm**
ASIA_EUREX (CEF Prod ID = 5618)	**Most liquid Eurex futures and options for Asia-Pacific region**	Listing Data	**06:45 am**	**06:45 am**
		Price Data	**08:00 am**	**10:05 pm**
		Daily Statistics Data	**10:50 pm**	**10:50 pm**
ASIA_STOXX_INDEX (CEF Prod ID = 5615)	**Euro Stoxx 50 indices, Euro Stoxx 600 indices and Stoxx Europe 50 indices**	Listing Data	**07:00 am**	**07:00 am**
		Price Data	**09:00 am**	**06:00 pm**
		Daily Statistics Data	**11:03 pm**	**11:03 pm**
ASIA_SPOT (CEF Prod ID = 5616)	**DAX40 equities and other asian equities listed on Xetra**	Listing Data	**06:30 am**	**06:30 am**
		Price Data	**09:00 am**	**05:45 pm**
		Daily Statistics Data	**06:30 pm**	**06:30 pm**

6. CEF Ultra+ Eurex T7 - Broadcast Interfaces

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 EMDI/EOBI 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	Eurex T7	59086	Eurex T7	59087
Simulation	Eurex T7	59586	Eurex T7	59587

6.1 CEF Ultra+ Eurex T7 EMDI (Enhanced Market Data Interface)

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

The un-netted market data consumes considerably bandwidth. The required bandwidth depends primarily on the products market data must be delivered for.

Eurex EMDI 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. 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.

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.

6.1.1 EMDI Details Eurex T7

The following multicast group ranges and ports are used:

Env.	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.50.2-9 224.0.50.12-63 224.0.29.2-63	224.0.50.130-137 224.0.50.140-191 224.0.30.2-63	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.91.0/27	193.29.91.32/27	-	
Simulation	Multicast groups	224.0.50.96-105 224.0.50.108-127 224.0.29.96 - 127	224.0.50.224-233 224.0.50.236-255 224.0.30.96 - 127	Snapshot: 59500 Incremental: 59501	Snapshot: 59532 Incremental: 59533
	Source networks	193.29.89.0/27	193.29.89.32/27	-	

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.

6.2 CEF Ultra+ Eurex T7 OBO (Enhanced Order Book Interface)

The Enhanced Order Book Interface (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 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 (EMDI). In production the EOBI interface is available exclusively via 10 Gbit/s connections in Co-Location.

Similar to the Eurex T7 EMDI, Eurex T7 EOBI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Eurex T7 EMDI. Please note that Eurex T7 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.

6.2.1 EOBI Details Eurex T7

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

Env.	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Production	Multicast groups	224.0.114.32-63 224.0.114.144-149 224.0.114.152-159 224.0.29.128-191	224.0.114.64-95 224.0.114.160-165 224.0.114.168-175 224.0.30.128-191	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	224.0.114.96-107 224.0.114.110-111 224.0.114.176-191	224.0.114.112-123 224.0.114.126-127 224.0.114.192-207	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. EOBI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to EMDI.

Due to the internal configuration of 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 EOBI multicast feeds are identical to those for the EMDI, as listed there.

6.3 Eurex T7 EMDS (Extended Market Data Service)

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

The settlement price and open interest information is disseminated in three separate multicast groups whereby each stream receives a separate multicast address.

Similar to the EMDI, the 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 EMDI.

6.3.1 EMDS Details Eurex T7

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

Env.	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	59032
	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: Eurex T7 trades	224.0.50.79	224.0.50.207	Replay only: 59001	Replay only: 59033
	Source networks	193.29.91.192/28	193.29.91.208/28		

Env.	Description	Multicast groups Service A	Multicast groups Service B	Ports: US-allowed products	Ports: US-restricted products
Simulation	Multicast group: Ticker Feed	224.0.50.91	224.0.50.219	59500	59532
	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	Replay: 59501	Replay: 59533
	Source networks	193.29.89.192/28	193.29.89.208/28		

Please note that the rendezvous points for the Extended Market Data Service multicast feeds are identical to those for the EMDI, as listed in there.

6.4 Eurex T7 RDI (Reference Data Interface)

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. A unique identifier references every tradable object. 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 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 EMDI.

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

RDI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to EMDI. For details see there.

Please note that the rendezvous points for the RDI multicast feeds are identical to those for the EMDI, as listed in there.

6.4.1 RDI Details Eurex T7

The following multicast groups and ports are used:

Env.	Description	Multicast groups Service A	Multicast groups Service B	Ports
Production	Multicast groups: Snapshot data	224.0.50.0	224.0.50.128	59098
Production	Multicast groups: Incremental data	224.0.50.1	224.0.50.129	59099
Production	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
Simulation	Multicast groups: Incremental data	224.0.50.97	224.0.50.225	59599
Simulation	Source networks	193.29.89.192/28	193.29.89.208/28	-

6.5 CEF Ultra+ Eurex Real-time Analytics

Eurex Real-time Analytics are key figures calculated in real-time, which can optionally be received via a CEF Ultra+ Eurex EMDI connection.

Similar to the EMDI, Eurex Real-time Analytics 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.

6.5.1 Eurex Real-time Analytics Details

The following multicast groups and ports are used for Eurex Real-time Analytics:

Env.	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	-
Production	Eurex IOC Liquidity Indicator for Options	224.0.114.128	224.0.114.130	59001	59033
Simulation	Reference Data	224.0.114.17	224.0.114.25	59500	--
Simulation	Eurex IOC Liquidity Indicator for Options	224.0.114.129	224.0.114.131	59501	59533

The Eurex Real-time Analytics Multicast addresses use the same source networks and rendezvous points as for 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.

7. CEF Ultra+ Xetra T7 Broadcast Interfaces

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	185.102.253.252	185.102.253.253
Simulation	193.29.94.252	193.29.94.253

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. Cash T7 RDI, Cash T7 EMDI, and Cash T7 EOBI send 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 (Xetra T7)	59086	59087
Production (Börse Frankfurt T7	56086	56087
Simulation (Xetra T7)	59586	59587
Simulation (Börse Frankfurt T7)	56586	56587

7.1 CEF Ultra+ Xetra T7 EMDI (Enhanced Market Data Interface)

The Cash T7 EMDI provides un-netted price-level aggregated market data. It is UDP based and disseminates market data to participants over a multicast network. The un-netted market data consumes considerably bandwidth. The required bandwidth depends primarily on the products market data must be delivered for.

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.

Cash T7 EMDI 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.

Cash T7 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.

7.1.1 Cash T7 EMDI - Details for Xetra T7

The following multicast group ranges and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XETR** 224.0.160.0 - 63	**XETR** 224.0.162.0 - 63	Snapshot: 59000 Incremental: 59001
	Source networks	185.102.252.0/26	185.102.252.64/26	
Simulation	Multicast groups	**XETR** 224.0.164.0 - 27	**XETR** 224.0.165.0 - 27	Snapshot: 59500 Incremental: 59501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.1.2 Cash T7 EMDI - Details for Börse Frankfurt T7

The following multicast group ranges and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XFRA** 224.0.160.96 - 111	**XFRA** 224.0.162.96 - 111	Snapshot: 56000 Incremental: 56001
	Source networks	185.102.252.0/26	185.102.252.64/26	
Simulation	Multicast groups	**XFRA** 224.0.164.64 - 79	**XFRA** 224.0.165.64 - 79	Snapshot: 56500 Incremental: 56501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.1.3 Cash T7 EMDI - Details for Deutsche Börse Digital Exchange T7

The following multicast group ranges and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XETR** 224.0.169.0 **XETR** 224.0.169.1	**XETR** 224.0.169.16 **XETR** 224.0.169.17	Snapshot: 59000 Incremental: 59001
	Source networks	185.102.252.0/26	185.102.252.64/26	
Simulation	Multicast groups	**XETR** 224.0.169.8 **XETR** 224.0.169.9	**XETR** 224.0.169.24 **XETR** 224.0.169.25	Snapshot: 59500 Incremental: 59501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.2 CEF Ultra+ Xetra T7 OBO (Enhanced Order Book Interface)

Cash T7 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 Cash T7 EOBI interface provides a high-detail, high-bandwidth alternative to recipients of the Cash T7 EMDI interface.

In production, the Cash T7 EOBI interface is available exclusively via 10 Gbit/s connections in Co-Location.

Similar to Cash T7 EMDI, Cash T7 EOBI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Cash T7 EMDI. Please note that Cash T7 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.

Cash T7 EOBI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to EMDI. For details see there.

7.2.1 Cash T7 EOBI - Details for Xetra T7

The following multicast group ranges and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XETR** 224.0.160.128 - 191	**XETR** 224.0.162.128 - 191	Snapshot: 59000 Incremental: 59001
	Source networks	185.102.252.0/26	185.102.252.64/26	
Simulation	Multicast groups	**XETR** 224.0.164.128 - 155	**XETR** 224.0.165.128 - 155	Snapshot: 59500 Incremental: 59501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.2.2 Cash T7 EOBI - Details for Börse Frankfurt T7

The following multicast group ranges and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XFRA** 224.0.160.224 - 239	**XFRA** 224.0.162.224 - 239	Snapshot: 56000 Incremental: 56001
Production	Source networks	185.102.252.0/26	185.102.252.64/26	
Simulation	Multicast groups	**XFRA** 224.0.164.192 - 207	**XFRA** 224.0.165.192 - 207	Snapshot: 56500 Incremental: 56501
Simulation	Source networks	193.29.94.0/27	193.29.94.32/27	

7.3 Cash T7 EMDS (Extended Market Data Service)

For the cash markets, the Cash T7 EMDS interface provides Ticker data and an All Trade Price (ATP) stream, which disseminates in real time all trade prices for the T7 Cash.

Cash T7 EMDI, it is UDP based and disseminates the respective data to participants over a multicast network.

Like Cash T7 EMDI, the Cash T7 EMDS interface provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Cash T7 EMDI.

7.3.1 Cash T7 EMDS Details for Xetra T7

The following multicast groups and ports are used:

Env.	Description	Service A	Service B	Ports
Production	All Trade Prices (ATP)	**XETR** 224.0.161.64	**XETR** 224.0.163.64	59000 Replay: 59001
	Ticker feed	**XETR** 224.0.161.31	**XETR** 224.0.163.31	59000
	Source networks	185.102.253.128/28	185.102.253.144/28	
Simulation	All Trade Prices (ATP)	**XETR** 224.0.164.120	**XETR** 224.0.165.120	59500 (XETR) Replay: 59501 (XETR)
	Ticker feed	**XETR** 224.0.164.95	**XETR** 224.0.165.95	59500
	Source networks	193.29.94.192/28	193.29.94.208/28	

7.3.2 Cash T7 EMDS Details for Börse Frankfurt T7

The following multicast groups and ports are used:

Env.	Description	Service A	Service B	Ports
Production	All Trade Prices (ATP)	**XFRA** 224.0.161.72-75	**XFRA** 224.0.163.72-75	56000 Replay: 56001
	Source networks	185.102.253.128/28	185.102.253.144/28	
Simulation	All Trade Prices (ATP)	**XFRA** 224.0.164.122	**XFRA** 224.0.165.122	56500 Replay: 56501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.3.3 Cash T7 EMDS Details for Deutsche Börse Digital Exchange T7

The following multicast groups and ports are used:

Env.	Description	Service A	Service B	Ports
Production	All Trade Prices (ATP)	**XETR** 224.0.169.5	**XETR** 224.0.169.21	59000 Replay: 59001
	Source networks	185.102.253.128/28	185.102.253.144/28	
Simulation	All Trade Prices (ATP)	**XETR** 224.0.169.13	**XETR** 224.0.169.29	59500 Replay: 59501
	Source networks	193.29.94.0/27	193.29.94.32/27	

7.4 Cash T7 RDI (Reference Data Interface)

T7 offers an interface dedicated to reference data, the Cash T7 RDI. Cash T7 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.

Cash T7 RDI delivers reference data in message format. Similar to Xetra T7 EMDI, the interface is multicast based. As Cash T7 EMDI, Cash T7 RDI provides data feeds in a "live-live" concept by disseminating two services, A and B. Therefore, the same rules apply, as for Cash T7 EMDI.

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

Please note: The RDI reference data for Deutsche Börse Digital Exchange instruments can only be received via the XETR RDI feed.

Cash T7 RDI sends out technical heartbeat messages periodically on every multicast address to keep routing trees alive, similar to Cash T7 EMDI. For details see there.

Please note: That the rendezvous points for the Cash T7 RDI multicast feeds are identical to those for the Cash T7 EMDI, as listed in there.

7.4.1 Cash T7 RDI Details for Xetra

The following multicast groups and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups	**XETR** 224.0.161.0	**XETR** 224.0.163.0	Snapshot: 59098 Incremental: 59099
Production	Source networks	185.102.253.128/28	185.102.253.144/28	
Simulation	Multicast groups	**XETR** 224.0.164.224	**XETR** 224.0.165.224	Snapshot: 59598 Incremental: 59599
Simulation	Source networks	193.29.94.192/28	193.29.94.208/28	

7.4.2 Cash T7 RDI Details for Börse Frankfurt T7

The following multicast groups and ports are used:

Env.	Description	Service A	Service B	Ports
Production	Multicast groups: Snapshot data	**XFRA** 224.0.161.9	**XFRA** 224.0.163.9	56098
	Multicast groups: Incremental data	**XFRA** 224.0.161.10	**XFRA** 224.0.163.10	56099
	Source networks	185.102.253.128/28	185.102.253.144/28	
Simulation	Multicast groups: Snapshot data	**XFRA** 224.0.164.233	**XFRA** 224.0.165.233	56598
	Multicast groups: Incremental data	**XFRA** 224.0.164.234	**XFRA** 224.0.165.234	56599
	Source networks	193.29.94.192/28	193.29.94.208/28	

8. Network Usage Guidelines and List of IP Prefixes

8.1 Network Usage Guidelines

8.1.1 General considerations

To guarantee an orderly operation of the exchanges access network, the following usage guidelines are given and must be adhered to.

8.1.2 Market-data packet classification in the IP protocol layer

The EOBI market data feed utilizes packet classification in the IP protocol layer.

For this the DSCP (Differentiated Services) field in the IP header is used to signal that a market data packet contains potential trigger information. The DSCP based market-data packet classification is only available on 10 Gbit/s co-location connections.

The actual values for the DSCP field will be chosen from "Pool 2" of 16 codepoints reserved for experimental or local use (EXP/LU) as defined in RFC 2474, see also

https://www.iana.org/assignments/dscp-registry/dscp-registry.xhtml

Note, that there is still no true QoS, but customers may choose to evaluate the DSCP flags set by Eurex and Xetra.

8.1.3 IGMP Guidelines

The multicast services use IGMP v2 as defined in RFC2236. Our routers send general IGMP membership queries approximately every 120 seconds. Multicast receivers are expected to respond to those queries within the maximum response time sent in the membership query. If receivers do not respond, our routers will stop sending after 180 seconds.

Multicast clients must not exceed message rates of:

a) one IGMP message (join or membership report) every 120 seconds per multicast group; and physical port
b) an overall limit of 250 IGMP messages per second

8.2 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
Rendezvous points for Eurex EMDI, EUREX EOBI and Eurex RDI	
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 Extended Market Data Service and Eurex RDI	
193.29.91.192/28	IP source network for service A, production
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	
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

IP prefix	Description
Eurex EOBI	
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

IP prefix	Description
Rendezvous points for Cash Market EMDI, EOBI and RDI (XETR)	
185.102.253.252	Rendezvous point for service A, production
185.102.253.253	Rendezvous point for service B, production
193.29.94.252	Rendezvous point for service A, simulation
193.29.94.253	Rendezvous point for service B, simulation
Cash Market Extended Market Data Service and RDI (XETR)	
185.102.253.128/28	IP source network for service A, production
185.102.253.144/28	IP source network for service B, production
193.29.94.192/28	IP source network for service A, simulation
193.29.94.208/28	IP source network for service B, simulation
Cash Market EMDI (XETR)	
185.102.252.0/26	IP source network for service A, production
185.102.252.64/26	IP source network for service B, production
193.29.94.0/27	IP source network for service A, simulation
193.29.94.32/27	IP source network for service B, simulation
Cash Market EOBI (XETR)	
185.102.252.0/26	IP source network for service A, production
185.102.252.64/26	IP source network for service B, production
193.29.94.0/27	IP source network for service A, simulation
193.29.94.32/27	IP source network for service B, simulation

IP prefix	Description
Cash Market Rendezvous points for EOBI and RDI (Börse Frankfurt)	
185.102.253.252	Rendezvous point for service A, production
185.102.253.253	Rendezvous point for service B, production
193.29.94.252	Rendezvous point for service A, simulation
193.29.94.253	Rendezvous point for service B, simulation
Cash Market Extended Market Data Service and RDI (Börse Frankfurt)	
185.102.253.128/28	IP source network for service A, production
185.102.253.144/28	IP source network for service B, production
193.29.94.192/28	IP source network for service A, simulation
193.29.94.208/28	IP source network for service B, simulation
Cash Market EMDI (Börse Frankfurt)	
185.102.252.0/26	IP source network for service A, production
185.102.252.64/26	IP source network for service B, production
193.29.94.0/27	IP source network for service A, simulation
193.29.94.32/27	IP source network for service B, simulation
Cash Market EOBI (Börse Frankfurt)	
IP source network for service A, production	
IP source network for service B, production	
IP source network for service A, simulation	
IP source network for service B, simulation	

9. Change Log

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

Release	Published	Chapter, page	Change
21.0	Aug. 12th, 2025	4.1.1, 17	Added CEF® Core (Eurex) host IP addresses

T7 Release 14.0

Extended Market Data Service

Trade Prices, Settlement Prices and Open Interest Data

Manual

Version   1

Date   08. August 2025

Content

1. Introduction

The Trading System T7 provides market and reference data via a set of multicast interfaces.

In addition to the Market Data Interface (MDI) for netted market data, the Enhanced Market Data Interface (EMDI) for un-netted market data, Enhanced Order Book Interface (EOBI) and the Reference Data Interface (RDI) for reference data, the Extended Market Data Service (EMDS) is also provided.

All interfaces distribute information via UDP multicast, following FIX 5.0 SP2 semantics and are FAST 1.1/1.2 encoded (except EOBI). Messages are in general published on two identical services (A and B) with different multicast addresses (live-live concept).

The present document describes the Extended Marked Data Service for Xetra and Eurex.

The Extended Market Data Service provides participants of T7 with:

- Intraday Settlement prices and Open Interest data (for Derivatives only)

- Trade Price information

This document lists the multicast addresses and describes the message layouts of the interface. FAST 1.1 and 1.2 templates will be provided for this Interface on the Eurex website at www.eurex.com and on the Xetra website www.xetra.com.

Based on an internal, reliable data stream an All Trade Price (ATP) stream is offered which disseminates in real time all trade prices for the T7 cash markets.

Furthermore, an additional 'Replay Service' is provided which allows users to 'recover' from loss for the following data items:

- Intraday Settlement prices,

- Open Interest data and

- Trade prices from T7 (on-exchange and TES trades)

The Replay service is simply a re-send of the data that was sent out before in real-time to give applications a chance to re-capture data again in its full format. There is no linkage in sequence numbers etc. between the real-time data and the replay data. The replay service for the cash market products is based on the ATP stream mentioned above.

Concerning TES trades (trades from the T7 Entry Service) which under MiFID II regulations are eligible for *deferred publication* (e.g. due to the size of a block trade), the Replay service is the mechanism for publication via multicast channels. The only other feed disseminating deferred TES trade reports is CEF Core – there are no such trade messages available on EMDI, however. The deferred messages are of type Trade Price (TID=175).

As this service is based on multicast, no individual requests are possible. Instead these messages are sent out at predefined times in replay cycles which start with a heading 'start of service' message and end with a trailing 'end of service' message (MDReport message). The number of messages is provided at each start of a cycle. All replay messages are sequenced within the appropriate multicast channel. Each cycle for the Eurex replay service for the US-allowed and the US-restricted products is triggered separately. The replay service should be processed for each channel separately. There are

at least two replay cycles per multicast channel per trading day. Within one replay cycle the data is replayed several times directly in a row.

Please note: The present document explains the Extended Market Service only. The other market and reference data interfaces listed above are described in the Market and Reference Data Interfaces Manual, which explains the general rules regarding FIX messages, FAST encoding and the live-live concept.

The Extended Market Data Interface described in this manual has a version number. The version number is also listed at the beginning of the FAST XML templates.
This manual relates to the interface version number 140.000.000.

Details regarding the EMDS Service 'Ticker data' are described in the separate document 'T7 Extended Market Data Service - Underlying Ticker Data Manual'.

2. Multicast addresses

The Settlement prices, Open Interest and Trade prices are disseminated via the following multicast addresses and port combinations in the Deutsche Börse Group network:

2.1 Production multicast addresses and ports

2.1.1 Production multicast addresses for Real-time Service

Service	Multicast - A	Multicast - B	Ports
Settlement prices – Eurex T7	224.0.50.77	224.0.50.205	Eurex T7:
Adj. Open Interest – Eurex T7	224.0.50.78	224.0.50.206	US-allowed products: 59000 US-restricted products: 59032
Xetra trades (XETR) - ATP	224.0.161.64	224.0.163.64	59000
Xetra trades (XBUL) - ATP	224.0.161.76	224.0.163.76	59000
Xetra trades (XMAL) - ATP	224.0.161.77	224.0.163.77	59000
Xetra trades (XVIE) - ATP	224.0.161.68	224.0.163.68	59000
Xetra trades (XFRA) - ATP	224.0.161.72	224.0.163.72	56000

2.1.2 Production multicast addresses for Replay Service

Service	Multicast - A	Multicast - B	Ports
Settlement prices – Eurex T7	224.0.50.77	224.0.50.205	Eurex T7:
Adj. Open Interest – Eurex T7	224.0.50.78	224.0.50.206	US-allowed products: 59001 US-restricted products: 59033
Eurex T7 trades (incl. TES)	224.0.50.79	224.0.50.207	
Xetra trades (XETR) – ATP based	224.0.161.64	224.0.163.64	59001
Xetra trades (XBUL) – ATP based	224.0.161.76	224.0.163.76	59001
Xetra trades (XMAL) – ATP based	224.0.161.77	224.0.163.77	59001
Xetra trades (XVIE) – ATP based	224.0.161.68	224.0.163.68	59001
Xetra trades (XFRA) – ATP based (except prices without turnover)	224.0.161.72	224.0.163.72	56001

Non-disclosed (deferred) TES trades are disseminated under the same multicast addresses as the other T7 trades.

2.2 Simulation multicast addresses and ports

2.2.1 Simulation multicast addresses for Real-time Service

Service	Multicast - A	Multicast - B	Ports
Settlement prices – Eurex T7	224.0.50.93	224.0.50.221	Eurex T7: US-allowed products: 59500 US-restricted products: 59532
Adj. Open Interest – Eurex T7	224.0.50.94	224.0.50.222	
Xetra trades (XETR) - ATP	224.0.164.120	224.0.165.120	59500
Xetra trades (XBUL) - ATP	224.0.164.120	224.0.165.120	59520
Xetra trades (XMAL) - ATP	224.0.164.120	224.0.165.120	59510
Xetra trades (XVIE) - ATP	224.0.164.121	224.0.165.121	59500
Xetra trades (XFRA) - ATP	224.0.164.122	224.0.165.122	56500

2.2.2 Simulation multicast addresses for Replay Service

Service	Multicast - A	Multicast - B	Ports
Settlement prices – Eurex T7	224.0.50.93	224.0.50.221	Eurex T7: US-allowed products: 59501 US-restricted products: 59533
Adj. Open Interest – Eurex T7	224.0.50.94	224.0.50.222	
Eurex T7 trades (incl. TES)	224.0.50.95	224.0.50.223	
Xetra trades (XETR) – ATP based	224.0.164.120	224.0.165.120	59501
Xetra trades (XBUL) – ATP based	224.0.164.120	224.0.165.120	59521
Xetra trades (XMAL) – ATP based	224.0.164.120	224.0.165.120	59511
Xetra trades (XVIE) – ATP based	224.0.164.121	224.0.165.121	59501
Xetra trades (XFRA) – ATP based (except prices without turnover)	224.0.164.122	224.0.165.122	56501

Non-disclosed (deferred) TES trades are disseminated under the same multicast addresses as the other T7 trades.

2.3   Service availability

To prevent network overload in peak situations, the bandwidth is limited, which might cause small delays. The service will be technically available at least between 7:00 CET and 23:10 CET.

The Adjusted Open Interest will be available after 13:30 CET. The intraday Settlement Prices will be available as soon as they are determined by Eurex in the afternoon (different product groups have different schedules).

Replay dissemination schedule

Replay dissemination start time	Replay content
8:10 am CET	Eurex trades – 1st cycle
10:00 am CET	Eurex Settlement prices – 1st cycle
0:30 pm CET	Eurex Settlement prices – 2nd cycle
1:00 pm CET	Xetra trades – 1st cycle
1:30 pm CET	Xetra Frankfurt trades – 1st cycle
2:00 pm CET	Eurex Adjusted Open interest – 1st cycle Eurex Settlement prices – 3rd cycle
5:45 pm CET	Eurex trades – 2nd cycle
6:00 pm CET	Xetra trades – 2nd cycle
6:15 pm CET	Eurex Settlement prices – 4th cycle
6:30 pm CET	Eurex Adjusted Open interest – 2nd cycle
8:15 pm CET	Eurex trades – 3rd cycle
10:05 pm CET	Xetra trades – 3rd cycle
10:10 pm CET	Xetra Frankfurt trades – 2nd cycle
10:30 pm CET	Eurex trades – 4th cycle
10:40 pm CET	Eurex Settlement prices – 5th cycle
10:55 pm CET	Eurex Adjusted Open interest – 3rd cycle
11:00 pm CET	Eurex non-disclosed TES trades

3. Data and service messages

3.1 Settlement prices (TID = 172)

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgType	Y	string	Message type Always 'W' = MarketDataSnapshotFullRefresh
48	SecurityID	Y	Int64	Instrument ID from T7 Trading System
22	SecurityIDSource	Y	string	Source Identification Always 'M' = Marketplace-assigned Identifier
1300	MarketSegmentID	Y	uInt32	Product ID from T7 Trading System
<MDFullGrp> sequence starts				
268	NoMDEntries	Y	length	Defines the number of entries to follow.
269	> MDEntryType	Y	MDEntryType (enum)	Type of Market Data entry Always '6' = Settlement Price
270	> MDEntryPx	Y	decimal	Intraday Settlement Price
731	> SettlPriceType	Y	SettlPriceType (enum)	Settlement Supplement 1 = Final (Final Settlement) 2 = Theoretical (Daily Settlement)
273	> MDEntryTime	Y	timestamp	Time of Market Data entry
<MDFullGrp> sequence ends				

Note: The settlement prices of the previous business day are provided with Reference data feed RDI in the instrument snapshot message and the Reference data file (RDF).

3.2 Adjusted open Interest (TID = 171)

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgType	Y	string	Message type Always 'W' = MarketDataSnapshotFullRefresh
48	SecurityID	Y	Int64	Instrument ID from T7 Trading System
22	SecurityIDSource	Y	string	Source Identification Always 'M' = Marketplace-assigned Identifier
1300	MarketSegmentID	Y	uInt32	Product ID from T7 Trading System
<MDFullGrp> sequence starts				
268	NoMDEntries	Y	length	Defines the number of entries to follow. Here always '1'.
269	> MDEntryType	Y	MDEntryType (enum)	Type of Market Data entry Always 'C' = Open Interest
271	> MDEntrySize	Y	decimal	Adjusted Open Interest Quantity
273	> MDEntryTime	Y	timestamp	Time of Market Data entry
<MDFullGrp> sequence ends				

3.3   Trade prices (TID = 175)

For the dissemination of trades from the T7 Trading System template id 175 is used which closely resembles template id 94 that is defined for EMDI/MDI trades (DepthIncremental messages), however parts that relate to orderbook information have been removed. For prices without turnover (PWT) MDEntrySize (271) is not set.

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgType	Y	string	Message type Always 'X' = MarketDataIncrementalRefresh
34	MsgSeqNum	Y	uInt32	The sequence number is incremented per product across all message types on a particular feed.
49	SenderCompID	Y	uInt32	Unique ID of a sender.
1300	MarketSegmentID	Y	uInt32	Technical Product ID from T7 Trading System
<MDIncGrp> sequence starts				
268	NoMDEntries	Y	length	Defines the number of entries to follow. Here always '1'.
1024	> MDOriginType	Y	MDOriginType (enum)	Market Data origin 0 = Book (On-exchange trading) 1 = Off-Book (TES trades only)
279	> MDUpdateAction	Y	MDUpdate Action (enum)	Type of Market Data update action 0 = New 1 = Change 2 = Delete
269	> MDEntryType	Y	MDEntryType (enum)	Type of Market Data entry '2' = Trade 'B' = Trade Volume
48	> SecurityID	Y	Int64	Technical Instrument ID from T7 Trading System
22	> SecurityIDSource	Y	string	Source Identification Always 'M' = Marketplace-assigned Identifier
270	> MDEntryPx	N	decimal	Trade Price
271	> MDEntrySize	N	decimal	Quantity or trade volume when MDEntryType = "2" or "B". TES disclosed quantity when MDOriginType is 1 = Off-Book.
273	> MDEntryTime	N	timestamp	Official time of trade execution (in nanoseconds)
828	> TrdType	N	TrdType (enum)	Trade Type 0 = Regular Trade 1 = Block Trade / Large in Scale (LIS) 2 = Exchange for Physical (EFP) 12 = Exchange for Swap (EFS) 54 = OTC (not used) 55 = Exchange Basis Facility (obsolete)

				1000 = Vola Trade
				1001 = EFP-Fin Trade
				1002 = EFP-Index-Futures Trade
				1004 = Block Trade at Market
				1006 = Xetra/Eurex Enlight triggered Trade
				1007 = Block QTPIP Trade
				1017 = Delta Trade at Market (Delta TAM)
				1100 = Opening Auction Trade
				1101 = Intraday Auction Trade
				1102 = Volatility Auction Trade
				1103 = Closing Auction Trade
				1104 = Cross Auction Trade
				1107 = IPO Auction Trade
				1108 = Liquidity Improvement Cross
				1109 = Retail Auction Vola Trade
2667	> AlgorithmicTrade-Indicator	N	Algorithmic Trade-Indicator (enum)	A trade has to be flagged as "algorithmic", if at least one of the matched orders was submitted by a trading algorithm. Applicable for cash market products only. 1 = Algorithmic Trade
277	> TradeCondition	N	TradeCondition (set)	Defines the type of price for MDEntryPx. U = Exchange Last R = Opening Price AX = High Price AY = Low Price AJ = Official Closing Price AW = Last Auction Price k = Out of sequence BD = Previous Closing Price a = Volume Only BC = Trading on Terms of Issue SA = Special Auction TC = Trade At Close XR = Xetra Retail BB = Xetra MidPoint
442	> MultiLegReportingType	N	MultiLeg-Reporting-Type (enum)	Only applicable for TES trades of derivatives market products. 1 = Single Security 2 = Individual Leg of a Multileg Security - Used to report a TES leg trade price of a complex instrument trade 3 = Multi Leg Security - Used to report a TES trade price on the complex instrument.
28750	> MultiLegPriceModel	N	MultiLeg-PriceModel (enum)	Only applicable for TES trades of derivatives market products. 0 = Standard 1 = User Defined - Used to report TES leg trade prices entered by a user.
2445	> AggressorTime	N	timestamp	Entry time of the incoming order that triggered the trade. Only present for MDEntryType = 2.
2446	> AggressorSide	N	Aggressor-Side	Side of the incoming order that triggered the trade. Only present for MDEntryType = 2.

			(enum)	1 = Buy 2 = Sell
2449	> NumberOfBuyOrders	N	uInt32	Number of buy orders involved in this trade. Only present for MDEntryType=2 and Trade Condition other than "a" (Volume Only).
2450	> NumberOfSellOrders	N	uInt32	Number of sell orders involved in this trade. Only present for MDEntryType=2 and Trade Condition other than "a" (Volume Only).
28911	> NumberOfBuySides	N	uInt32	Number of buy sides involved in an off-exchange trade. Only present for MDOriginType 1 = Off-Book.
28912	> NumberOfSellSides	N	uInt32	Number of sell sides involved in an off-exchange trade. Only present for MDOriginType 1 = Off-Book.
6139	> TotalNumberOfTrades	N	uInt32	Total number of trades during the day. Only present for MDEntryType=2. Applicable for cash market products only. An increment of TotalNumberOfTrades is defined as the maximum of NumberOfBuyOrders (2449) and NumberOfSellOrders (2450) per trade.
28869	> RestingCxlQty	N	decimal	Quantity that was cancelled due to SMP. Only present for MDEntryType = 2.
278	> MDEntryID	N	uInt32	Represents the match step ID. This field is unique together with MarketSegmentID.
28873	> NonDisclosedTrade Volume	N	decimal	Contains the TES trade volume that is not displayed during the day. Only present for MDEntryType B = Trade Volume. Used when trade volume is finally disclosed and for recovery.
<Parties> (optional) sequence starts				
453	> NoPartyIDs	N	length	Number of PartyID (448), PartyIDSource (447), and PartyRole (452) entries. Here always '1'.
448	>> PartyID	N	string	Execution Venue ID
447	>> PartyIDSource	N	string	Market Identifier Code (ISO 10383) MIC Here always 'G'.
452	>> PartyRole	N	uInt32	Identifies the type or role of the PartyID (448) specified. Here always '73' (Execution Venue)
<Parties> (optional) sequence ends				
<MDIncGrp> sequence ends				

3.4 Packet header (TID = 77)

Each datagram contains a packet header which is used for identification of datagrams and is sent on a channel basis. Each header contains the following fields:

Field Name	FAST Data Type	Description
SenderCompID	uInt32	Unique id for a sender Each multicast channel uses the same logic. Constant value: • Standard Value • Failover Value
PacketSeqNum	ByteVector	Datagram/packet sequence number Contiguous. Can be used for gap detection. Sequenced for each multicast channel itself. The PacketSeqNum's in the packet header are contiguous per SenderCompID, multicast address and port combination.
SendingTime	ByteVector	Time at which this packet left the sender (in nanoseconds since epoch).

The following table shows the structure of the block header before FAST-decoding:

1 Byte	1 Byte	1 Byte	1 Byte	4 Bytes	1 Byte	8 Bytes
PMAP	TID	Sender Comp ID	Length	PacketSeqNum	Length	SendingTime
1	2	3	4	8	9	17

3.5 Extended technical heartbeat (TID = 170)

The heartbeat message is sent periodically as a 'line active' indicator when there are no messages generated on the feed for a preconfigured period of time. Each heartbeat contains the following fields:

Field Name	FAST Data Type	Description
SenderCompID	uInt32	Unique id for a sender. Each multicast channel uses the same logic. Constant value: • Standard Value • Failover Value
LastPacketSeqNum	uInt32	Contains the last PacketSeqNum of the corresponding multicast channel.

3.6 Market Data Report Message (TID = 152)

The MDReport message is used for the Replay Service. It is sent as a wraparound bracket for distributing the product and instrument snapshots. Since the replay service is also a dissemination cycle, start and end marks are needed. Each MDReport contains the following fields:

FIX Tag	FIX Field Name	Req'd	FAST Data Type	Description
35	MsgType	Y	string	U20 - MarketDataReport
2536	MDReportCount	N	uInt32	Count of messages in the replay cycle. Only sent for MDReportEvent 3, 5, 7 and 9
369	LastMsgSeqNumProcessed	N	uInt32	Number of the last processed message sequence number
2535	MDReportEvent	Y	MDReport Event (enum)	1 = Start of instrument reference Data (not used) 2 = End of instrument reference Data (not used) 3 = Start of off-market trades 4 = End of off-market trades 5 = Start of order book (exchange) trades 6 = End of order book (exchange) trades 7 = Start of open interest 8 = End of open interest 9 = Start of settlement prices 10 = End of settlement prices 11 = Start of statistics reference data 12 = End of statistics reference data 13 = Start of statistics (not used) 14 = End of statistics (not used)
60	TransactTime	Y	timestamp	Transaction Time

4.   Change log

No	Chapter, page	Date	Change
10.0	General	July 27, 2021	Creation of simulation version for T7 10.0, updated packet header to 75 and interface version number
10.1	General	Mar 08, 2022	Creation of simulation version for T7 10.1, added tag 731 (SettlPriceType) in chapter 3.1, updated packet header to 76 and interface version number
10.11	General	May 13, 2022	Creation of production version of T7 10.1
10.12	Ch. 3.1	May 23, 2022	SettlPriceType set to mandatory
11.00	General	July 27, 2022	Creation of simulation version for T7 11.0, removed MDSecPx in Ch. 3.1
11.01	Ch. 2.3	Aug 23, 2022	Added a third replay cycle at 10:05 CET for Xetra trades
11.02	General	Oct 04, 2022	Creation of production version of T7 11.0
11.1	General	Feb 14, 2023	Creation of simulation version for T7 11.1, updated packet header to 75 and interface version number
11.11	General	Mar 30, 2023	Creation of production version of T7 11.1
12.0	General + Ch. 3.3	Aug 09, 2023	Creation of simulation version for T7 12.0, updated packet header to 76 and interface version number, added TradeCondition XR (Xetra Retail) + removed BB (Midpoint trade), added trdType 1017 (Delta TAM)
12.01	General	Sep 04, 2023	Updated version numbering to 'Version 1'
12.02	General	Sep 25, 2023	Updated version number to 'Version 2'
12.1	General	Feb 05, 2024	Creation of version 1 for T7 12.1
12.11	Ch. 2	Feb 28, 2024	Integration of multicast addresses for DBDX
12.12	General	Apr 08, 2024	Updated version number to 'Version 2'
13.0	General + Ch. 3.3	Jul 09, 2024	Creation of simulation version for T7 13.0, updated packet header to 75 and interface version number, added TradeCondition BB (Xetra Midpoint)
13.0	Ch. 3.3	Jul 23, 2024	Added new fields NumberOfBuySides (28911) and NumberOfSellSides (28912)
13.01	Ch. 2 + Ch. 3.3	Sep 13, 2024	Updated version number to '2', removed Xetra source DBDX
13.1	General	Feb 07, 2025	Creation of version 1 for T7 13.1
14.0	General	Jun 11, 2025	Creation of version 1 for T7 14.0, updated type of field SettlPriceType (731), added Retail auction vola TrdType
	Ch. 2.3	Aug 08, 2025	Added three additional replay cycles for Eurex Settlements