

# **T7 Disaster Recovery Concept 2021 - update**

**Interface Configuration Details** 

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#### 1 Introduction

This document provides an overview of Deutsche Börse's disaster recovery concept for the T7 trading system. It contains the required technical background information as well as functional features and limitations to enable participants to continue trading in a DR situation.

Please note: Chapter 2 and 3 describe the general set up of <u>real DR scenarios</u> whereas chapter 5 focuses on the <u>DR test exercise</u>, describing which interfaces and functionalities are in scope of the disaster recovery test exercise and which are not.

Participation in the T7 disaster recovery test exercise is not only strongly recommended by Deutsche Börse but it is also seen as an essential part of the industry's disaster recovery readiness.

Therefore, Deutsche Börse kindly requests all Trading Participants to take part in the T7 disaster recovery test.

For an overall description of T7 network options, please refer to the document "N7 Network Access Guide", also available on the Eurex and Xetra website:

www.eurex.com -> Support -> Initiatives & Releases -> T7 Release 9.1 -> Network Access

<u>www.xetra.com</u> -> Technology -> T7 Trading architecture -> System documentation -> Release 9.1 -> Network Access

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### 2 Disaster recovery scenarios

### 2.1 Status quo

The following drawing describes the different connection possibilities to the primary data centre.

Three types of customer installations have to be considered:

- Customer installations inside the primary data centre (co-location)
- Customer installations connecting to the Frankfurt Access Point (customers in Germany)
- Customer installations connecting to remote Access Points (London, Chicago, etc.)

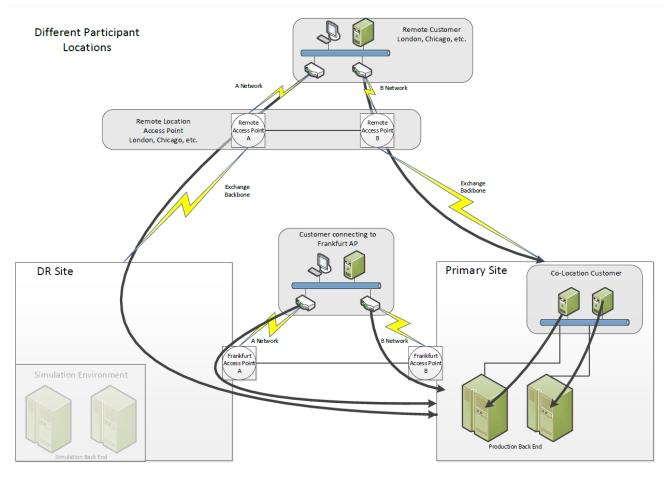


Figure 1: All three types of customer installations and their redundant connectivity to the T7 production back ends.

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### 2.2 DR scenario 1 - Total loss of primary data centre

Figure 2 displays the result of a DR scenario that renders the whole facility of the primary data centre inaccessible.

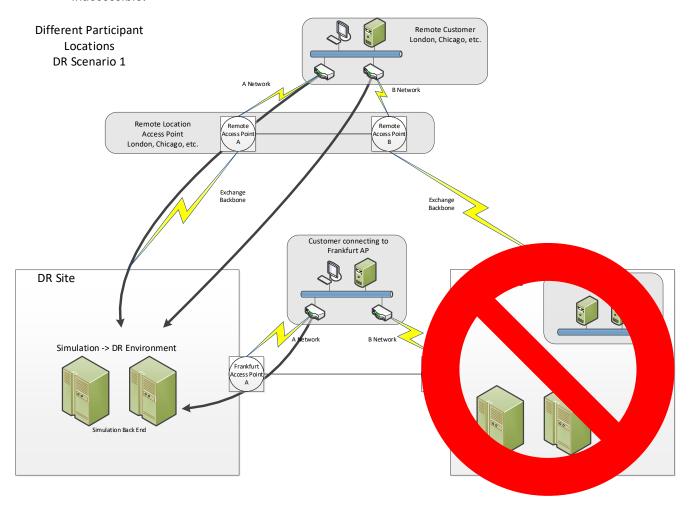


Figure 2: Disaster recovery scenario 1

In such a scenario, customer installations connecting to remote access points (i.e. London, Chicago, etc.) will continue to use both leased lines connecting them to the local access point. The local access point continues to use backbone lines to Frankfurt which are terminating in the secondary data centre.

Customer installations connecting to the Frankfurt access point will be able to continue to use a single leased line connecting to the access point half located in the secondary data centre.

Customer installations within the primary data centre are considered to be non-functional in this DR scenario.

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### 2.3 DR scenario 2 - Partial loss of primary data centre, co-location still accessible

Figure 3 displays the result of a DR scenario that renders the T7 back end of the primary data centre (FR2) inaccessible. The co-location facility is still accessible. Co-location customers are still able to access the DR data centre.

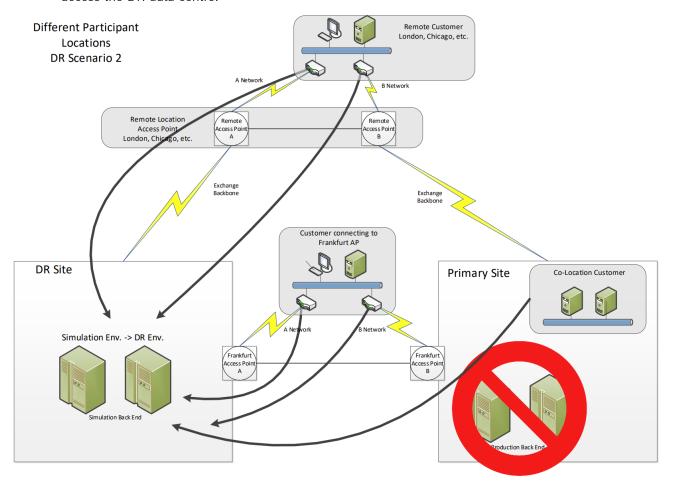


Figure 3: Disaster recovery scenario 2

In such a scenario, only the T7 back end located in the primary data centre will be considered to be non-functional.

Customer installations connecting to remote access points (i.e. London, Chicago, etc.) will continue to use both leased lines connecting them to the local access point. The local access point continues to use backbone lines to Frankfurt which are terminating in the secondary data centre.

Customer installations connecting to the Frankfurt access point will continue to use both leased lines connecting them to the access point half located in the secondary data centre.

Co-location customers will be able to continue to use their existing connection to the secondary data centre to access the DR environment.

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#### 3 General considerations

In a disaster recovery scenario, the T7 infrastructure regularly used for T7 simulation will be re-used to serve as T7 disaster recovery production infrastructure.

The switch of the back ends and the transfer of reference data will not be instantaneous but is expected to take up to two hours.

While most T7 interfaces will be available in the disaster recovery scenario, several conceptual differences to regular production exist and have to be accounted for.

#### 3.1 Functional

- Order books will be empty after switch to the DR environment.
- IDs (MatchStepID, EventID etc.) are reset and start from "1" again. Timestamps must be used to detect duplicate IDs.
- OrderIDs are based on timestamps, no further action required.
- Trades of the current business day will not be transferred to T7 DR System but can still be inquired from the respective Clearing systems.
- T7 DR system will start with an empty trade data base. However, all Trades reported in DR will start with an offset of 10.000.000.
- Intraday defined strategies will not be transferred to the T7 DR system.
- Number of partitions in DR is lower than in Production and therefore the product assignment to partitions will differ
- A new reference data file (RDF) will be produced during DR start up and will be published by the DR back end (as well as further intraday updates) onto the Common Report Engine into the respective production directory.

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### 3.2 Configuration for DR

#### 3.2.1 Same as Production

- User IDs, ETI and FIX (LF) sessions will be used from production.
- All TCP and UDP Ports will be the same as for normal production.
- GUI Java WebStart Server will be the same as for normal production.
- Existing FIX Gateway implementation (planned to be decommissioned in 2022): A-side subnet will be the same as for normal production.
- Multicast Groups will be the same as for normal production for the following T7 broadcast interfaces<sup>1</sup>:
  - Market Data Interface (MDI)
  - Enhanced Market Data Interface (EMDI)
  - Extended Market Data Service (EMDS)
  - o Market Signals (MS) derivatives market only
  - o Reference Data Interface (RDI)
- Rendezvous Points (RP) will be the same as for normal production<sup>1</sup>.
- Technical Heartbeats will be the same as for normal production<sup>1</sup>.
- CRE A-Side Subnet will be the same as for normal production.

### 3.2.2 Differ from Production

- ETI Trading Gateway and Partition Specific Gateway Subnets will differ from regular production.
- New FIX LF Gateway Subnets (introduced with T7 Release 9.0) will differ from regular production
- GUI Landing Pages and (Crypto) Proxy Servers will differ from regular production.
- Stream-A multicast groups for Enhanced Order Book Interface (EOBI) will differ from regular production (Stream B for EOBI is not available).
- Source IP addresses will differ from regular production for the following T7 broadcast interfaces:
  - Market Data Interface (MDI)
  - o Enhanced Market Data Interface (EMDI)
  - Enhanced Order Book Interface (EOBI)
  - Extended Market Data Service (EMDS)
  - Market Signals (MS) derivatives market only
  - o Reference Data Interface (RDI)

<sup>&</sup>lt;sup>1</sup>Stream B Multicast Groups, Rendezvous Points and Technical Heartbeats will only be available for DR scenario 2

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### 3.2.2.1 Enhanced Order Book Interface (EOBI)

Deutsche Börse offers the possibility to receive EOBI data in case of a Disaster Recovery scenario.

Customers connecting via leased line, who have access to the regular "A" multicast streams, will be able to receive EOBI data using dedicated EOBI multicast addresses (see <u>chapter 4</u> for network details). Please make sure that your internal firewall settings are adjusted accordingly.

Please be aware that Stream B for EOBI is currently not available in DR.

#### 3.3 Return to Production

After the DR scenario has been resolved, Deutsche Börse will communicate the procedure for reestablishing the connection to the production environment with adequate notification time.

For more detailed information, please refer to the document "Emergency Playbook on Incident Handling" which is available on the Eurex and Xetra website:

https://www.eurex.com/ex-en/find/circulars/Eurex-Exchange-Readiness-Newsflash-Publication-of-Emergency-Playbook-on-Incident-Handling--2798796

https://www.xetra.com/xetra-en/newsroom/circulars/xetra-circulars/Cash-Market-Readiness-Newsflash-Publication-of-Emergency-Playbook-on-Incident-Handling--2798786

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### 4 Disaster recovery network details

Due to the nature of the distributed T7 architecture, different interfaces will be configured in varying ways.

T7 interfaces whose production infrastructure is solely located in the primary data centre will switch to the simulation infrastructure and need to be accessed via simulation network addresses (i.e. ETI gateways, FIX LF gateways).

Other T7 interfaces whose production infrastructure is distributed across both data centres will be able to continue to use the existing/remaining production infrastructure in the DR data centre (i.e. FIX gateways, multicast addresses).

On the following pages, you can find all available T7 interface connection details in a disaster recovery scenario.

### 4.1 Ping test

Due to the previously described concept, all needed IP addresses (except EOBI multicast address range, see <a href="https://chapter.org/ch

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### 4.2 T7 network details derivatives markets

### 4.2.1 Eurex T7

The following tables summarize all available interface connection details in a disaster recovery scenario for T7 Eurex (XEUR).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
GUI Landing Page	Internet	http://webgui.eurexchange.com/eme	rgency	80 / 443	TCP/IP
		http://webgui.vpn.eurexchange.com/emergency		80 / 443	TCP/IP
GUI	Leased line	http://webgui.vpn.eurexchange.com/emergency/fqdn.html		80 / 443	TCP/IP
ra Start	Internet	193.29.90.190	-	80 / 443	TCP/IP
Java WebStart	Leased line	193.29.93.173	193.29.93.160/28	80 / 443	TCP/IP
		193.29.90.235			
II Proxie	Internet	193.29.90.236	193.29.90.224/27	80	TCP/IP
GUI (Crypto) Proxies	Leased line - side A	193.29.89.225	193.29.89.224/28	/	
	Leased line - side B	193.29.95.225	193.29.95.224/28	80 / 8089	TCP/IP
	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
	PS trading GW - Partition 1	193.29.89.129 (active)	193.29.89.161 (stand-by)		
딥	PS trading GW - Partition 2	193.29.89.130 (active)	193.29.89.162 (stand-by)	19043	TCP/IP
	PS trading GW - Partition 3	193.29.89.154 (active)	193.29.89.187 (stand-by)		
	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP
vay	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.150.253.31	90.150.253.0 / 24	Individually assigned	TCP/IP
LF ace w)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface (new)	LF trading gateways	193.29.89.65	193.29.89.97	19024	TCP/IP
st	Description	Rendezvous point Side A	Rendezvous point Side B <sup>(*)</sup>	Ро	rts
All T7 broadcast interfaces	Rendezvous points	193.29.91.252/32	193.29.91.253/32	-	
	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 1: Eurex T7 network details in DR scenario, part 1/2

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	December 1911	Mariation of museum Committee A		Ро	rts
	Description	Multicast groups Service A	Multicast groups Service B (*)	US-allowed	US-restricted
MDI	Multicast groups	224.0.50.64-65 224.0.50.67-74	224.0.50.192-193 224.0.50.195-202	59000	59032
	Source networks	224.0.29.72-76 193.29.89.192/28	224.0.30.72-76 193.29.89.208/28		
	*Only applicable for DR scenario		193.29.09.200/20		
	, , , , , , , , , , , , , , , , , , , ,				
	Description	Multicast groups Service A	Multicast groups Service B (*)	US-allowed	rts US-restricted
EMDI	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	193.29.89.0/27	193.29.89.32/27		
	*Only applicable for DR scenario	2			
	Description	Multicast groups Service A (**)	Port		
	Description	224.0.169.32-63	US-allowed products	US-restricted p	
EOBI	Multicast groups	224.0.169.144-159 224.0.172.128-191	Snapshot: 59000 Incremental: 59001		t: 59032 al: 59033
	Source networks	193.29.89.0/27	-		
	**Multicast address range of EO	BI is dedicated to Disaster Recovery Env	ironment only (no re-use of production a	idress range)	
	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Po US-allowed	rts US-restricted
nals	Reference Data	224.0.114.1	224.0.114.9	59000	-
Market Signals	Eurex IOC liquidity Indicator for Options	224.0.114.128	224.0.114.130	59001	59033
Mar	Risk Alerts	224.0.114.134	224.0.114.138	59001	59033
	Source networks	193.29.89.0/27	193.29.89.32/27		
	*Only applicable for DR scenario	2			
ice	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Po US-allowed	rts US-restricted
a Serv	Ticker Feed	224.0.50.75	224.0.50.203	00 4.101104	
Market Data Sewice (EMDS)	Settlement prices	224.0.50.77	224.0.50.205	59000 Replay: 59001	59032 Replay: 59033
Mark (EM	Intraday open interest data	224.0.50.78	224.0.50.206		
Extended	Eurex T7 trades	224.0.50.79	224.0.50.207	Replay: 59001	Replay: 59033
Exte	Source networks	193.29.89.192/28	193.29.89.208/28		
	*Only applicable for DR scenario	2			
	Description	Mutlicast groups Service A	Multicast groups Service B (*)	Ро	orts
=	Multicast groups	224.0.50.0	224.0.50.128	Snapsho	t: 59098
RDI	Multicast groups	224.0.50.1	224.0.50.129	Increment	al: 59099
	Source networks	193.29.89.192/28	193.29.89.208/28		
	*Only applicable for DR scenario	2			
port	Connection option	Gateway IP address	IP subnets		orts L Dominio
Common Report Engine	Internet	193.29.90.132	193.29.90.128/27	Public	Particip.
omm	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
O					

Table 2: Eurex T7 network details in DR scenario, part 2/2

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### 4.2.2 EEX T7

The following tables summarize all available interface connection details in a disaster recovery scenario for the European Energy Exchange (XEEE).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.eurexchange.com/eme	rgency/eex	80 / 443	TCP/IP
GUI Landing Page	Lacard Gra	http://webgui.vpn.eurexchange.com/emergency/eex		80 / 443	TCP/IP
GUI	Leased line	http://webgui.vpn.eurexchange.com/emergency/eex/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.190	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.173	193.29.93.160/28	80 / 443	TCP/IP
SS	Internet	193.29.90.235	102 20 00 224/27	80	TCP/IP
JI Proxie	Internet	193.29.90.236	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.89.225	193.29.89.224/28	00 / 0000	TOD/ID
9	Leased line - side B	193.29.95.225	193.29.95.224/28	80 / 8089	TCP/IP
E	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP
× way	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.150.253.31	90.150.253.0 / 24	Individually assigned	TCP/IP
FIX LF nterface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface (new)	LF trading gateways	193.29.89.65	193.29.89.97	19024	TCP/IP
ast es	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Poi	rts
All T7 broadcast interfaces	Rendezvous points	193.29.91.252/32	193.29.91.253/32	-	
<u>.</u> <u>.</u>	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 3: EEX T7 network details in DR scenario, part 1/2

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	Description	Multicast groups Service A	Multicast groups Service B (*)	US-allowed	rts US-restricted
MDI	Multicast groups	224.0.50.66	224.0.50.194	59000	59032
	Source networks	193.29.89.192/28	193.29.89.208/28		-
	*Only applicable for DR scenario	2			
				D-	
	Description	Multicast groups Service A	Multicast groups Service B (*)	US-allowed	rts US-restricted
EMDI	Multicast groups	224.0.50.10 224.0.50.11	224.0.50.138 224.0.50.139	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.89.0/27	193.29.89.32/27	-	
	*Only applicable for DR scenario	2			
	Description	Mutlicast groups service A	Multicast groups Service B (*)	Po	rts
RDI	Multicast groups	224.0.29.0	224.0.30.0	Snapsho	t: 59098
<u>~</u>	Multicast groups	224.0.29.1	224.0.30.1	Increment	al: 59099
	Source networks	193.29.89.192/28	193.29.89.208/28		-
	*Only applicable for DR scenario	2			
<b>a</b> `				_ Po	orts
on Igine	Connection option	Gateway IP address	IP subnets	Public	Particip.
Common Report Engine	Internet	193.29.90.132	-	2221	2222
Rep	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	

Table 4: EEX T7 network details in DR scenario, part 2/2

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### 4.3 T7 network details cash markets

### 4.3.1 Xetra T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Xetra T7 (XFTR).

	or Xetra T7 (XETR).				
Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency		80 / 443	TCP/IP
	Lagrand line	http://webgui.vpn.xetra.com/emerger	ncy	80 / 443	TCP/IP
GUI	Leased line	http://webgui.vpn.xetra.com/emergency/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
SS	l	193.29.90.233	102.00.00.004/07	00	TOD/ID
JI Proxie	Internet	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto) Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	00 / 0000	TOD/ID
2)	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP
	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
E	PS trading GW - Partition 30	193.29.94.129 (active)	193.29.94.161 (stand-by)	19043	TCP/IP
Ш	PS trading GW - Partition 31	193.29.94.130 (active)	193.29.94.162 (stand-by)	19043	TCP/IP
	LF trading gateways	193.29.94.65	193.29.94.97	19006	TCP/IP
ау	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
FIX LF interface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX inter (ne	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
7 ast ces	Description	Rendezvous point Side A	Rendezvous point Side B <sup>(*)</sup>	Port	ts
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
Q . <u>=</u>	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 5: Xetra T7 network details in DR scenario, part 1/2

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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
_					
M	Multicast groups	224.0.161.16 - 22	224.0.163.16 - 22	59000	
	Source networks	193.29.94.192/28	193.29.94.208/28	-	
	*Only applicable for DR scena	ario 2			
			(*)	-	
_	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
EMDI	Multicast groups	224.0.160.0 - 63	224.0.162.0 - 63	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.94.0/27	193.29.94.32/27	-	
	*Only applicable for DR scena	ario 2			
	Description	Multicast groups Service A	Ports		
EOBI	Multicast groups (**)	224.0.173.128-191	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.94.0/27	-		
	**Multicast address range of	EOBI is dedicated to Disaster Recovery E	Environment only (no re-use of production ac	idress range)	
<u> </u>			(*)	_	
rket MDS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
d Market ce (EMDS)	Description  All Trade Prices (ATP)	Multicast groups Service A 224.0.161.64	Multicast groups Service B (*) 224.0.163.64	59000	
ended Market Service (EMDS)					
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.64	224.0.163.64	59000 Replay: 59001	
Extended Market Data Service (EMDS)	All Trade Prices (ATP) Ticker feed	224.0.161.64 224.0.161.31 193.29.94.192/28	224.0.163.64 224.0.163.31	59000 Replay: 59001	
Extended Market Data Service (EMDS)	All Trade Prices (ATP)  Ticker feed  Source networks  *Only applicable for DR scenario	224.0.161.64 224.0.161.31 193.29.94.192/28 ario 2	224.0.163.64 224.0.163.31 193.29.94.208/28	59000 Replay: 59001 59000	
	All Trade Prices (ATP) Ticker feed Source networks	224.0.161.64 224.0.161.31 193.29.94.192/28	224.0.163.64 224.0.163.31	59000 Replay: 59001 59000 - Ports	
Extended Market Data Service (EMDS)	All Trade Prices (ATP)  Ticker feed  Source networks  *Only applicable for DR scenario	224.0.161.64 224.0.161.31 193.29.94.192/28 ario 2	224.0.163.64 224.0.163.31 193.29.94.208/28	59000 Replay: 59001 59000	
	All Trade Prices (ATP)  Ticker feed  Source networks  *Only applicable for DR scenarious  Description	224.0.161.64  224.0.161.31  193.29.94.192/28  ario 2  Mutlicast groups service A	224.0.163.64 224.0.163.31 193.29.94.208/28  Multicast groups Service B (*)	59000 Replay: 59001 59000 - Ports Snapshot: 59098	
	All Trade Prices (ATP)  Ticker feed  Source networks *Only applicable for DR scena  Description  Multicast groups	224.0.161.64  224.0.161.31  193.29.94.192/28  Mutlicast groups service A  224.0.161.0  193.29.94.192/28	224.0.163.64  224.0.163.31  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.0	59000 Replay: 59001 59000 - Ports Snapshot: 59098	
RDI	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scenarion Multicast groups Source networks *Only applicable for DR scenarion	224.0.161.64  224.0.161.31  193.29.94.192/28  ario 2  Mutlicast groups service A  224.0.161.0  193.29.94.192/28  ario 2	224.0.163.64  224.0.163.31  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.0  193.29.94.208/28	59000 Replay: 59001 59000  - Ports Snapshot: 59098 Incremental: 59099 -	
RDI	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scena Description Multicast groups Source networks	224.0.161.64  224.0.161.31  193.29.94.192/28  Mutlicast groups service A  224.0.161.0  193.29.94.192/28	224.0.163.64  224.0.163.31  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.0	59000 Replay: 59001 59000 - Ports Snapshot: 59098	
	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scenarion Multicast groups Source networks *Only applicable for DR scenarion	224.0.161.64  224.0.161.31  193.29.94.192/28  ario 2  Mutlicast groups service A  224.0.161.0  193.29.94.192/28  ario 2	224.0.163.64  224.0.163.31  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.0  193.29.94.208/28	59000 Replay: 59001 59000  - Ports Snapshot: 59098 Incremental: 59099 - Ports	

Table 6: Xetra T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.2 Börse Frankfurt T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Börse Frankfurt T7 (XFRA).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.xetra.com/emergency/xfra		80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emergency/xfra		80 / 443	TCP/IP
GU	Leaseu IIIIe	http://webgui.vpn.xetra.com/emergency/xfra/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja	Leased line	193.29.93.174	-	80 / 443	TCP/IP
Se	Internet	193.29.90.253	193.29.90.224/27	82	TCP/IP
GUI to)Proxie	memet	193.29.90.254	193.29.90.224/27	62	TGF/IF
GUI (Crypto) Proxies	Leased line - side A	193.29.94.227	193.29.94.224/29	82 / 8091	TCP/IP
0)	Leased line - side B	193.29.94.235	193.29.94.232/29	02 / 0091	TGF/IF
Б	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	LF trading gateways	193.29.94.66	193.29.94.98	16006	TCP/IP
x way	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.196	90.152.253.0/24	Individually assigned	TCP/IP
FIX LF interface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX inter (ne	LF trading gateways	193.29.94.66	193.29.94.98	16024	TCP/IP
	<b>Description</b>	Rendezvous point Side A	Rendezvous point Side B <sup>(*)</sup>	Poi	rts
T7 Icast aces		·		1 01	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
⊒. ם	Technical heartbeat	-	-	A: 56086	B: 56087
1	*Only applicable for DR scenario	. 2			

Table 7: Börse Frankfurt T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B (*)	Poi	rts
M	Multicast groups	224.0.161.40-47	224.0.163.40-47	560	00
	Source networks	193.29.94.192/28	193.29.94.208/28	-	
	*Only applicable for DR scenario	2			
	Description	Multicast groups Service A	Ports		
EOBI	Multicast groups (**)	224.0.173.224-239	Snapshot: 56 Incremental: 5		
	Source networks	193.29.94.0/27	-	0001	
	**Multicast address range of EO	BI is dedicated to Disaster Recovery Envi	ironment only (no re-use of production ad	dress range)	
d ata IDS)	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Poi	rts
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.72-75	224.0.163.72-75	560 Replay:	
Ey Ma Servi	Source networks	193.29.94.0/27	193.29.94.32/27	-	
	*Only applicable for DR scenario	2			
	Description	Mutlicast groups service A	Multicast groups Service B <sup>(*)</sup>	Poi	rts
RDI	Multicast groups	224.0.161.9	224.0.163.9	Snapshot Incrementa	
	Source networks	193.29.94.192/28	193.29.94.208/28	-	
	*Only applicable for DR scenario	2			
rine	Connection option	Gateway IP address	IP subnets	Poi Public	rts Particip.
Common Report Engine	Internet	193.29.90.132	-		
Cc Repo	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222

Table 8: Börse Frankfurt T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.3 Vienna T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Vienna T7 (XVIE).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ling	Internet	http://webgui.xetra.com/emergency/z	<u>xvie</u>	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emerge	ncy/xvie	80 / 443	TCP/IP
GU	Leaseu IIIIe	http://webgui.vpn.xetra.com/emerge	ncy/xvie/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
SS	Internet	193.29.90.233	102 20 00 224/27	80	TOD/ID
GUI to)Proxie	mternet	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
0)	Leased line - side B	193.29.94.233	193.29.94.232/29	60 / 6069	TOF/IF
	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
E	PS trading GW - Partition 50	193.29.92.193 (active)	193.29.92.201 (stand-by)	19043	TCP/IP
	LF trading gateways	193.29.94.65	193.29.94.97	19006	TCP/IP
IX eway Id)	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
J. Ce	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface (new)	FIX LF gateway	193.29.94.65 (active)	193.29.94.97 (stand-by)	19024	TCP/IP
ast es	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Po	rts
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
ı.	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 9: Vienna T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
MD	Multicast groups	224.0.161.32-36	224.0.163.32 - 36	59000
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scena	rio 2		
	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports
EMDI	Multicast groups	224.0.160.64-95	224.0.162.64 - 95	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	193.29.92.96/27	-
	*Only applicable for DR scena	rio 2		
	Description	Multicast groups Service A	Ports	
EOBI	Multicast groups (**)	224.0.173.192-201	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	-	
	**Multicast address range of	EOBI is dedicated to Disaster Recovery E	invironment only (no re-use of production ad	idress range)
ket ADS)	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.68	224.0.163.68	59000 Replay: 59001
endec Servic	Ticker feed	224.0.161.39	224.0.163.39	59000
Ext Data	Source networks	193.29.94.192/28	193.29.94.208/28	-
	*Only applicable for DR scena	rio 2		
	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
RDI	Multicast groups	224.0.161.1	224.0.163.1	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scena	rio 2		Table

10: Vienna T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.4 Malta T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Malta T7 (XMAL).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ling	Internet	http://webgui.xetra.com/emergency/x	mal	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emerger	ncy/xmal	80 / 443	TCP/IP
GUI	Leased line	http://webgui.vpn.xetra.com/emerger	ncy/xmal/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
SS	l	193.29.90.233	102.00.00.004/07	00	TOD/ID
JI Proxie	Internet	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	90 / 9090	TCD/ID
0)	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP
Б	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
ay	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually	TCP/IP
	Leased line - Side A	90.132.233.41	90.132.233.0/24	assigned	101/11
FIX LF interface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX inter (ne	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
ast es	Description	Rendezvous point Side A	Rendezvous point Side B <sup>(*)</sup>	Port	:s
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
ā .E	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 11: Malta T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
MDI	Multicast groups	224.0.161.50 - 51	224.0.163.50 -51	59000
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scenar	rio 2		
	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
EMDI	Multicast groups	224.0.160.114 - 115	224.0.162.114 - 115	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	193.29.92.96/27	-
	*Only applicable for DR scenar	rio 2		
	Description	Multicast groups Service A	Ports	
EOBI	Multicast groups (**)	224.0.173.242-243	Snapshot: 59 Incremental: 5	
	Source networks	193.29.92.64/27	<u>-</u>	
	**Multicast address range of E	OBI is dedicated to Disaster Recovery E	Environment only (no re-use of production ac	ldress range)
l ta DS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.77	224.0.163.77	59000 Replay: 59001
E) Ma Servi	Source networks	193.29.94.192/28	193.29.94.208/28	-
	*Only applicable for DR scenar	rio 2		
	Description	Mutlicast groups service A	Multicast groups Service B <sup>(*)</sup>	Ports
RDI	Multicast groups	224.0.161.8	224.0.163.8	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.92.176/29	193.29.92.184/29	
	*Only applicable for DR scenar	rio 2		
n gine	Connection option	Gateway IP address	IP subnets	Ports Public Particip.
Common Report Engine	Internet	193.29.90.132		
Cc	Leased line - side A	193.29.90.67	193.29.90.64/27	2221 2222

Table 12: Malta T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.5 Bulgaria T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Bulgaria T7 (XBUL).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.xetra.com/emergency/x	<u>bul</u>	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emergency/xbul		80 / 443	TCP/IP
	Leaseu iiiie	http://webgui.vpn.xetra.com/emerger	ncy/xbul/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
es	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
GUI to)Proxi	internet	193.29.90.234	193.29.90.224/27	80	TOF/IF
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
9	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TOP/IP
=	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
E					
Ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
	Trading gateways (LF only)  Connection option	193.29.94.65 IP addresses	193.29.94.97 IP subnets	19006 Ports	TCP/IP Protocol
FIX Gateway E1 (old)					
FIX Gateway (old)	Connection option	IP addresses	IP subnets	Ports Individually	Protocol
FIX Gateway (old)	Connection option	IP addresses	IP subnets	Ports Individually	Protocol
	Connection option  Leased line - side A	IP addresses 90.152.253.41	IP subnets 90.152.253.0/24	Ports Individually assigned	Protocol TCP/IP
FIX LF FIX interface Gateway (new)	Connection option  Leased line - side A  Gateway type  LF trading gateways	IP addresses 90.152.253.41  IP addresses Side A 193.29.94.65	IP subnets 90.152.253.0/24 IP addresses Side B 193.29.94.97	Ports Individually assigned  Ports 19024	Protocol  TCP/IP  Protocol  TCP/IP
FIX LF FIX interface Gateway (new)	Connection option  Leased line - side A  Gateway type	IP addresses 90.152.253.41 IP addresses Side A	IP subnets 90.152.253.0/24 IP addresses Side B	Ports Individually assigned Ports	Protocol  TCP/IP  Protocol  TCP/IP
FIX LF FIX interface Gateway (new)	Connection option  Leased line - side A  Gateway type  LF trading gateways	IP addresses 90.152.253.41  IP addresses Side A 193.29.94.65	IP subnets 90.152.253.0/24 IP addresses Side B 193.29.94.97	Ports Individually assigned  Ports 19024	Protocol  TCP/IP  Protocol  TCP/IP
FIX LF FIX interface Gateway (old)	Connection option  Leased line - side A  Gateway type  LF trading gateways  Description	IP addresses 90.152.253.41  IP addresses Side A 193.29.94.65  Rendezvous point Side A 185.102.253.252	IP subnets 90.152.253.0/24  IP addresses Side B 193.29.94.97  Rendezvous point Side B (*)	Ports Individually assigned  Ports 19024	Protocol  TCP/IP  Protocol  TCP/IP

Table 13: Bulgaria T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
M	Multicast groups	224.0.161.48	224.0.163.48	59000	
	Source networks	193.29.92.176/29	193.29.92.184/29	-	
	*Only applicable for DR scena	rio 2			
	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
EMDI	Multicast groups	224.0.160.112 - 113	224.0.162.112 - 113	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	193.29.92.96/27	-	
	*Only applicable for DR scena	rio 2			
	Description	Multicast groups Service A	Ports		
EOBI	Multicast groups (**)	224.0.173.240-241	·	napshot: 59000 remental: 59001	
	Source networks	193.29.92.64/27	-		
	**Multicast address range of E	OBI is dedicated to Disaster Recovery E	invironment only (no re-use of production ac	ldress range)	
_					
cet 1DS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
l Market ce (EMDS)	Description  All Trade Prices (ATP)	Multicast groups Service A 224.0.161.76	Multicast groups Service B (*) 224.0.163.76	59000	
ended Market Service (EMDS)					
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.76	224.0.163.76	59000 Replay: 59001	
Extended Market Data Service (EMDS)	All Trade Prices (ATP) Ticker feed	224.0.161.76 224.0.161.49 193.29.94.192/28	224.0.163.76 224.0.163.49	59000 Replay: 59001	
Extended Market Data Service (EMDS)	All Trade Prices (ATP) Ticker feed Source networks	224.0.161.76 224.0.161.49 193.29.94.192/28	224.0.163.76 224.0.163.49	59000 Replay: 59001	
Extended Market Data Service (EMDS)	All Trade Prices (ATP)  Ticker feed  Source networks  *Only applicable for DR scena	224.0.161.76 224.0.161.49 193.29.94.192/28 rio 2	224.0.163.76 224.0.163.49 193.29.94.208/28	59000 Replay: 59001 59000	
_	All Trade Prices (ATP)  Ticker feed  Source networks  *Only applicable for DR scena  Description	224.0.161.76  224.0.161.49  193.29.94.192/28  rio 2  Mutlicast groups service A	224.0.163.76 224.0.163.49 193.29.94.208/28 Multicast groups Service B (*)	59000 Replay: 59001 59000 - - Ports Snapshot: 59098	
_	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scena Description Multicast groups	224.0.161.76  224.0.161.49  193.29.94.192/28  rio 2  Mutlicast groups service A  224.0.161.7  193.29.92.176/29	224.0.163.76  224.0.163.49  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.7	59000 Replay: 59001 59000 - - Ports Snapshot: 59098	
RDI	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scena Description Multicast groups Source networks	224.0.161.76  224.0.161.49  193.29.94.192/28  rio 2  Mutlicast groups service A  224.0.161.7  193.29.92.176/29	224.0.163.76  224.0.163.49  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.7	59000 Replay: 59001 59000 Ports Snapshot: 59098 Incremental: 59099	
_	All Trade Prices (ATP) Ticker feed Source networks *Only applicable for DR scena Description Multicast groups Source networks *Only applicable for DR scena	224.0.161.76 224.0.161.49 193.29.94.192/28 rio 2  Mutlicast groups service A 224.0.161.7 193.29.92.176/29 rio 2	224.0.163.76  224.0.163.49  193.29.94.208/28  Multicast groups Service B (*)  224.0.163.7  193.29.92.184/29	59000 Replay: 59001 59000 - Ports Snapshot: 59098 Incremental: 59099	

Table 14: Bulgaria T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.6 Budapest T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Budapest T7 (XBUD).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding.	Internet	http://webgui.xetra.com/emergency/x	<u>bud</u>	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emerger	ncy/xbud	80 / 443	TCP/IP
GUI	Leased line	http://webgui.vpn.xetra.com/emerger	ncy/xbud/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja	Leased line	193.29.93.174	-	80 / 443	TCP/IP
SS	l., t.,	193.29.90.233	102.00.00.004/07	80	TOD/ID
JI Proxie	Internet	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	90 / 9090	TCP/IP
0)	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP
E	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
'ay	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
FIX LF interface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX inter	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
				_	
ast ses	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Port	:s
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
ے. ۵	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 15: Budapest T7 network details in DR scenario, part 1/2

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	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports
MDI	Multicast groups	224.0.161.54 - 55	224.0.163.54 - 55	59000
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scenario	2		
	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports
EMDI	Multicast groups	224.0.160.120 - 123	224.0.162.120 - 123	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	193.29.92.96/27	-
	*Only applicable for DR scenario	2		
	Description	Multicast groups Service A	Ports	
EOBI	Multicast groups (**)	224.0.173.248-251	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	-	
	**Multicast address range of EOI	BI is dedicated to Disaster Recovery Envi	ronment only (no re-use of production ad	dress range)
	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
RDI	Multicast groups	224.0.161.4	224.0.163.4	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scenario	2		

Table 16: Budapest T7 network details in DR scenario, part 2/2

Gruppe Deutsche Börse	Deutsche Börse AG
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### 4.3.7 Ljubljana T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Ljubljana T7 (XLJU).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.xetra.com/emergency/	xlju	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emerge	ncy/xlju	80 / 443	TCP/IP
	Leaseu IIIIe	http://webgui.vpn.xetra.com/emerge	ncy/xlju/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
se	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
J.I Proxi	mtemet	193.29.90.234	193.29.90.224/27	80	TGF/IF
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
0)	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TGF/IF
E.	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
<u>&gt;</u>	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
ace ()	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface (new)	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
' ast	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Por	ts
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
i. p	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	o 2			

Table 17: Ljubljana T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
M	Multicast groups	224.0.161.56 - 57	224.0.163.56 - 57	59000
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scena	rio 2		
	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
EMDI	Multicast groups	224.0.160.124 - 125	224.0.162.124 - 125	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	193.29.92.96/27	-
	*Only applicable for DR scena	rio 2		
	Description	Multicast groups Service A	Ports	
EOBI	Multicast groups (**)	224.0.173.252-253	Snapshot: 59 Incremental: 5	
	Source networks	193.29.92.64/27	-	
	**Multicast address range of	EOBI is dedicated to Disaster Recovery En	vironment only (no re-use of production ac	idress range)
	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
RDI	Multicast groups	224.0.161.5	224.0.163.5	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.92.176/29	193.29.92.184/29	-
	*Only applicable for DR scena	rio 2		

Table 18: Ljubljana T7 network details in DR scenario, part 2/2

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### 4.3.8 Prague T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Prague T7 (XPRA).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.xetra.com/emergency/x	prg	80 / 443	TCP/IP
GUI Landing Page	Leased line	http://webgui.vpn.xetra.com/emerger	ncy/xprg	80 / 443	TCP/IP
GU	Leased life	http://webgui.vpn.xetra.com/emerger	ncy/xprg/fqdn.html	80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
Se	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
GUI to)Proxie	memei	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
9	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP
<b>E</b>	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
k way 1)	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
FIX LF interface (new)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX inter (ne	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
	Description	Rendezvous point Side A	Rendezvous point Side B <sup>(*)</sup>	Port	s
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	_	
Al brog	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 19: Prague T7 network details in DR scenario, part 1/2

Gruppe Deutsche Börse	Deutsche Börse AG
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	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports	
MDI	Multicast groups	224.0.161.52 - 53	224.0.163.52 - 53	59000	
	Source networks	193.29.92.176/29	193.29.92.184/29	-	
	*Only applicable for DR scenario	2			
	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
EMDI	Multicast groups	224.0.160.116 - 119	224.0.162.116 - 119	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	193.29.92.96/27	-	
	*Only applicable for DR scenario	2			
Description Multicast groups Service A Po		Ports			
EOBI	Multicast groups (**)	224.0.173.244-247	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.92.64/27	-		
	**Multicast address range of EOI	BI is dedicated to Disaster Recovery Envi	Environment only (no re-use of production address range)		
	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports	
RDI	Multicast groups	224.0.161.3	224.0.163.3	Snapshot: 59098 Incremental: 59099	
	Source networks	193.29.92.176/29	193.29.92.184/29	-	
	*Only applicable for DR scenario	2			

Table 20: Prague T7 network details in DR scenario, part 2/2

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### 4.3.9 Zagreb T7

The following tables summarize all available interface connection details in a disaster recovery scenario for Zagreb T7(XZAG).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
ding	Internet	http://webgui.xetra.com/emergency/xzag		80 / 443	TCP/IP
GUI Landing Page	http://webgui.vpn.xetra.com/emergency/xzag		ncy/xzag	80 / 443	TCP/IP
Leased line		http://webgui.vpn.xetra.com/emergency/xzag/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
Ja Web	Leased line	193.29.93.174	-	80 / 443	TCP/IP
Se	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
GUI to)Proxie	mternet	193.29.90.234	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
0)	Leased line - side B	193.29.94.233	193.29.94.232/29	60 / 6069	TGF/IF
E	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
Ш	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
/ay	Connection option	IP addresses	IP subnets	Ports	Protocol
FIX Gateway (old)	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
LF ace N)	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface (new)	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
ast es	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Port	ts
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
<u>.</u> <u>.</u> <u>.</u> .	Technical heartbeat	-	-	A: 59086	B: 59087
	*Only applicable for DR scenario	2			

Table 21: Zagreb T7 network details in DR scenario, part 1/2

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	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
MDI	Multicast groups	224.0.161.58 - 59	224.0.163.58 - 59	59000	
	Source networks	193.29.92.176/29	193.29.92.184/29	-	
	*Only applicable for DR scenario	2			
	Description	Multicast groups Service A	Multicast groups Service B <sup>(*)</sup>	Ports	
EMDI	Multicast groups	224.0.160.126 - 127	224.0.162.126 - 127	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	193.29.92.96/27	-	
	*Only applicable for DR scenario	2			
	Description	Multicast groups Service A	Ports		
EOBI	Multicast groups (**) 224.0.173.254-255 Snapshot: 5 Incremental:		Snapshot: 59 Incremental: 5'		
	Source networks	193.29.92.64/27	-		
	**Multicast address range of EO	BI is dedicated to Disaster Recovery Envi	Environment only (no re-use of production address range)		
	Description	Mutlicast groups service A	Multicast groups Service B <sup>(*)</sup>	Ports	
RDI	Multicast groups	224.0.161.6	224.0.163.6	Snapshot: 59098 Incremental: 59099	
	Source networks	193.29.92.176/29	193.29.92.184/29	-	
	*Only applicable for DR scenario	2			

Table 22: Zagreb T7 network details in DR scenario, part 2/2

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### 5 Disaster recovery test script

Deutsche Börse's disaster recovery test exercises will be performed typically twice a year on a weekend (usually Saturday).

These exercises will be conducted for the markets Eurex, Xetra and Börse Frankfurt. Please inquire with the respective partner exchange to find out whether and to what extent it participates.

During a DR test exercise, production reference data will be used, including User IDs, T7 GUI SSH keys, FIX LF sessions as well as ETI sessions.

Trade date for the DR test exercise is DR test date -1 business day (e.g. DR test date: 23.10.2021 > trade date: 22.10.2021)

<u>Please note:</u> Changes done to these reference data will <u>not</u> be copied back to production after the test. It is not advised to perform any changes to this data during the test exercise. Any order book or trading information created during the DR test exercise will **not** be transferred back to production.

### 5.1 Disaster recovery test scenario

The DR test scenario will simulate an outage of the regular T7 production system which is hosted in the primary data centre facility (see  $\underline{\text{chapter 2.3}}$ )

However, this DR test scenario will not simulate a complete data centre outage, which means that also co-location customers will be able to attend on the test (DR scenario 2).

In such a disaster recovery scenario, T7 infrastructure regularly used for T7 simulation will be used to serve as DR production infrastructure.

### 5.2 Schedule of the disaster recovery test

Planned start DR test: 14:00h CE(S)T

Planned end DR test: 16:00h CE(S)T

Planned start re-connection test: 17:00h CE(S)T

Planned end re-connection test: 18:00h CE(S)T

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### 5.3 Success criteria for the disaster recovery test

The disaster recovery test exercise can be regarded as successful when

- **either** a message "Connection Test ###### < hh:mm:ss>" appears with an increasing sequence number in the market news view (news board) of the T7 Trader or Admin GUI
- **or** a successful session or trader login via ETI has been performed **and** MDI/EMDI/EOBI/RDI heartbeats have been received.

### 5.4 DR test exercise: Availability of market data

During the disaster recovery test exercise, participants will be able to receive market data via the following interfaces (see chapter 4 for network details):

- T7 Trader GUI
- T7 Market Data Service (MDI)
- T7 Enhanced Market Data Service (EMDI) not applicable for Börse Frankfurt T7 (XFRA)
- T7 Enhanced Order Book Interface (EOBI)

<u>Please note:</u> Unlike the other market data interfaces, EOBI will be accessible via dedicated multicast addresses. Please make sure that your internal firewall settings are adjusted accordingly.

### 5.5 DR test exercise: Availability of reference data

During the disaster recovery test exercise, participants will be able to

- read reference data via Reference Data Interface (RDI) (see chapter 4 for network details).
- receive the Reference Data File (RDF) via the Common Report Engine (CRE)
   <u>Please note:</u> In a real DR situation, the RDFs would be transferred in the production folder.
   During a DR test exercise, RDF data will be distributed in the simulation folder.

The files could be easily identified as test files because the DR environment number(s) will be used for its naming convention.

XEUR, XEEE, XETR, XMAL and XBUL: 45

Example: 45FILRDF01PUBLI20210709XEUR9SHMT001.XML.ZIP

• XFRA: 41

Example: 41FILRDF05PUBLI20210709XFRA9SKWJ000.XML.ZIP

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<sup>&</sup>lt;sup>2</sup> Depends on the respective exchange (Eurex, Xetra, etc)

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The respective files can be found under the following tree(s):

XEUR and XEEE:

/publicarea/publi/S/eurex/

XETR, XMAL and XBUL:

/publicarea/publi/S/xetra/

XFRA:

/publicarea/publi/S/xetra\_ffm2

#### 5.6 DR test exercise: Enhanced Transaction Interface (ETI)

During the disaster recovery test exercise, participants have to

- use productive ETI sessions
- use productive ETI session/trader logins

Participants will be able to

- receive news board messages
- access all instruments
- add orders/quotes
- modify orders/quotes
- delete orders/quotes
- match orders/quotes (not applicable for XFRA)

### 5.7 DR test exercise: New FIX LF interface (back office session)

During the disaster recovery test exercise, participants have to

- use productive FIX sessions
- use productive FIX session/trader logins

Participants will be able to

• receive trade confirmations via back office sessions

### 5.8 DR test exercise: Trader/Admin/Clearer GUI

During the disaster recovery test exercise, participants have to

• use DR landing pages described in chapter 4

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- use productive T7 GUI SSH keys
- Log in with productive user IDs

#### Participants will be able to

receive news board messages

#### Trader GUI only:

- receive price information
- access all instruments
- add orders
- modify orders
- delete orders
- match orders (not applicable for Börse Frankfurt T7 (XFRA))

### 5.9 DR test exercise: Common Report Engine (CRE)

Participants will be able to access the Common Report Engine to receive RDF test data in the simulation folder (in a real DR situation the RDFs would be transferred in the production folder as usual).

The files could be easily identified as test files because the DR environment number (XEUR, XEEE, XETR, XMAL and XBUL:45, XFRA:41) is used for its naming convention.

However, no further reports will be generated during the disaster recovery test exercise.

#### 5.10 Re-connection test

After the disaster recovery test exercise has been completed, the regular production environment is planned to be made available from 17:00h CE(S)T until 18:00h CE(S)T for a re-connect test in order to allow participants to adapt their configurations.

The T7 production environment will be shutdown afterwards and will be re-started for the next business day on Sunday evening, at the usual time.

### 5.11 Support

The Technical Key Account Managers will be available for supporting the disaster recovery test exercise via your individual VIP number from 14:00h CE(S)T until 18:00h CE(S)T.

### 5.12 Interfaces out of scope

The following T7 interfaces will  $\underline{not}$  be available during the DR test exercise:

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- Extended Market Data Service
- Market Signals (MS)
- Existing FIX Gateway interface implementation (planned to be decommissioned in 2022)

Please note: The new FIX LF interface (introduced with T7 Release 9.0) will be in scope

### 5.13 Eurex C7

Eurex Clearing's C7 will also offer some test possibilities on 23 October 2021. Please refer to document "Eurex Clearing C7 FIXML Failover Testing 2021" for further information.

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# 6 Change log

The change log describes on a higher level, what changed in the latest version of the document over older versions.

No	Chapter	Date	Change
1.0.0		27 Sept 2013	Initial version the Eurex Exchange's T7 Disaster Recovery Concept
2.0.0	All	25 July 2016	Added EOBI, EMDS and Eurex Market Signals
3.1.1	All	31 August 2017	Change to common document including T7 cash markets and EEX
4.0	All	29 August 2018	Adhere to T7 Release 6.1 (e.g. Partition Specific Gateway, etc), added Introduction
2019	All	15 August 2019	Adhere to T7 Release 7.1 (e.g. deletion of Connection GWs), added additional IP for Xetra Partition Specific Gateway, added EOBI addresses, added Partner Exchanges
2020-1.0	All	4 September 2020	Adhere to T7 Release 8.1, added EOBI chapter, added Vienna Partner Exchanges
2020-1.1	2, 4, 5	11 November 2020	Added network set up for Börse Frankfurt, updated DR scenarios, added DR test script
2021-1.0	3, 4, 5	18 February 2021	Added new LF FIX interface
2021-2.0	3, 4, 5	28 August 2021	Update of B multicast streams (chapter 4), RDF data available via CRE (chapter 5)
2021-2.1	3, 4, 5	15 October 2021	Partner Exchanges: Update regarding start of support of ETI HF sessions and new source networks for market data protocols.
			Added example file name for RDF
			Added link to Emergency Playbook