T7 Disaster Recovery Concept 2022 - update

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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 **real DR scenarios** whereas chapter 5 focuses on the **DR test exercise**, 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 10.1 -> Network Access

www.xetra.com -> Technology -> T7 Trading architecture -> System documentation -> Release 10.1 -> 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
- Customer installations connecting to remote Access Points (London, Chicago, etc.)
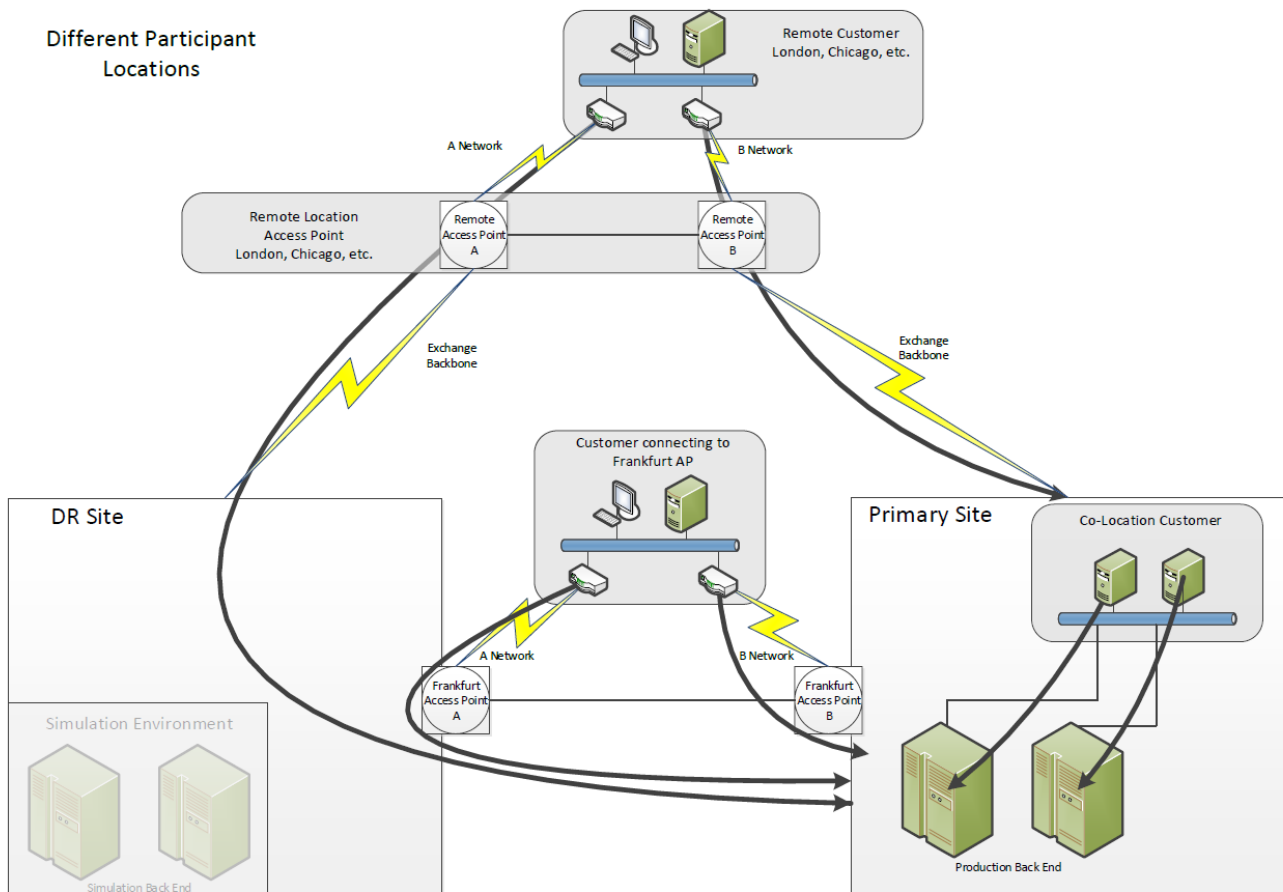
Figure 1: All three types of customer installations and their redundant connectivity to the T7 production back ends.

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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.
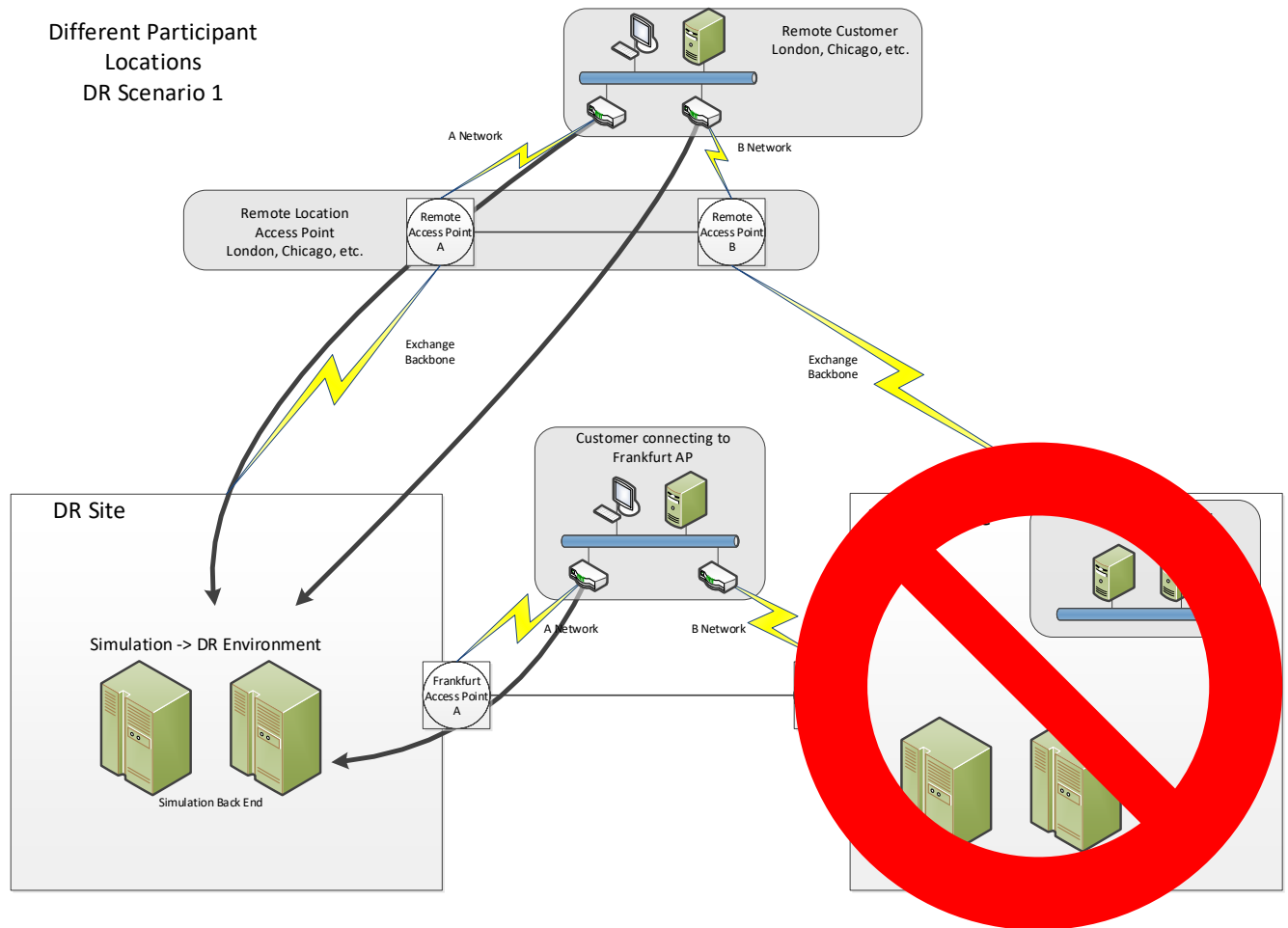
Figure 2: Disaster recovery scenario 1

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.
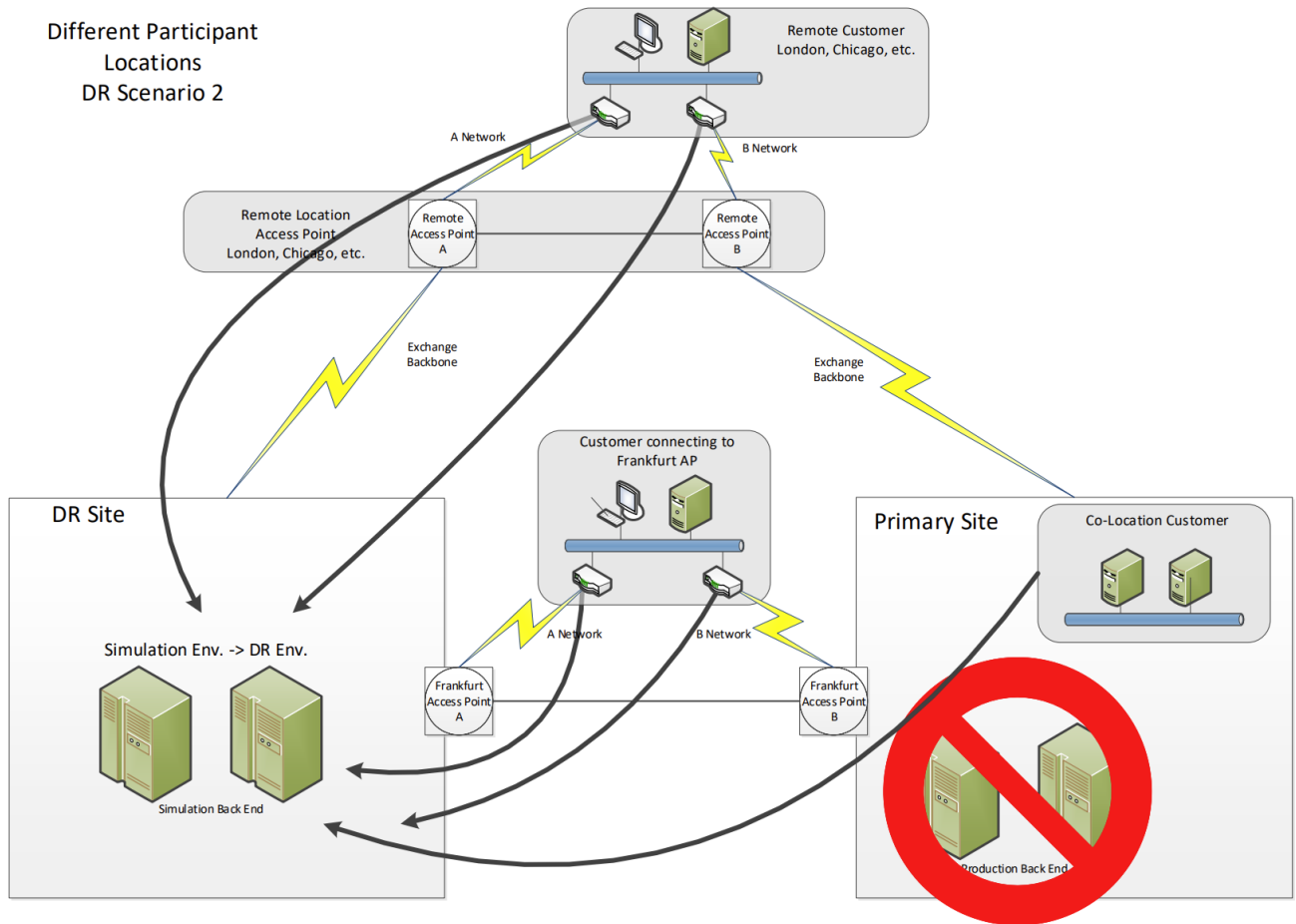
Figure 3: Disaster recovery scenario 2

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, on-exchange trades as well as match numbers reported in a DR scenario will start with an offset of 5.000.000 whereas TES trades will start with an offset of 1.000.000.
- 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.
- Multicast Groups will be the same as for normal production for the following T7 broadcast interfaces[1]:
    - o Market Data Interface (MDI)
    - o Enhanced Market Data Interface (EMDI)
    - o 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[1].
- Technical Heartbeats will be the same as for normal production[1].
- CRE 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.
- FIX LF Gateway Subnets 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:
    - o Market Data Interface (MDI)
    - o Enhanced Market Data Interface (EMDI)
    - o Enhanced Order Book Interface (EOBI)
    - o Extended Market Data Service (EMDS)
    - o Market Signals (MS) - derivatives market only
    - o Reference Data Interface (RDI)

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.

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[1]Stream B Multicast Groups, Rendezvous Points and Technical Heartbeats will only be available for DR scenario 2

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In DR scenario 1, 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 chapter 4 for network details).

In DR scenario 2, co-location customers will be able to receive EOBI data using the same dedicated EOBI multicast addresses via their cross-connects.

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 re-establishing 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. 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 chapter 3.2.2.1) are already in use either in T7 production environment or T7 simulation environment and accessible at any time. Because of that set-up it is not necessary to offer a dedicated ping test prior to the disaster recovery test exercise.

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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	https://t7gui.emergency.eurex.com/xeur/index.html 193.29.90.181		443	TCP/IP
	Leased line	https://t7gui.emergency.vpn.eurex.com/xeur/index.html 193.29.93.168		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.eurex.com/xeur/jnlp 193.29.90.181		443	TCP/IP
	Leased line	https://t7gui.emergency.vpn.eurex.com/xeur/jnlp 193.29.93.168		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.235 193.29.90.236	193.29.90.224/27	80	TCP/IP
	Leased line - side A	193.29.89.225	193.29.89.224/28	80 / 8089	TCP/IP
	Leased line - side B	193.29.95.225	193.29.95.224/28		

ETI	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)	19043	TCP/IP
	PS trading GW - Partition 2	193.29.89.130 (active)	193.29.89.162 (stand-by)		
	PS trading GW - Partition 3	193.29.89.154 (active)	193.29.89.187 (stand-by)		
	PS trading GW - Partition 4	193.29.89.155 (active)	193.29.89.186 (stand-by)		
	PS trading GW - Partition 5	193.29.89.153 (active)	193.29.89.185 (stand-by)		
	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP

FIX LF interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
	FIX LF gateway	193.29.89.65 (active)	193.29.89.97 (stand-by)	19024	TCP/IP
	FIX LF gateway (encrypted)	fixlf01a.emergency.vpn.eurex.com 193.29.89.65 (active)	fixlf01b.emergency.vpn.eurex.com 193.29.89.97 (stand-by)	19017	TCP/IP

All T7 broadcast interfaces	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Ports	
	Rendezvous points	193.29.91.252/32	193.29.91.253/32	-	
	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

MDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
				US-allowed	US-restricted
	Multicast groups	224.0.50.64-65 224.0.50.67-74 224.0.29.72-76	224.0.50.192-193 224.0.50.195-202 224.0.30.72-76	59000	59032
	Source networks	193.29.89.192/28	193.29.89.208/28	-	

*Only applicable for DR scenario 2

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

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EMDI	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
				US-allowed	US-restricted
	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

EOBI	Description	Multicast groups Service A [(**)]	Ports	
			US-allowed products	US-restricted products
	Multicast groups	224.0.169.32-63 224.0.169.144-159 224.0.172.128-191	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.89.0/27	-	

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

Market Signals	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
				US-allowed	US-restricted
	Reference Data	224.0.114.1	224.0.114.9	59000	-
	Eurex IOC liquidity Indicator for Options	224.0.114.128	224.0.114.130	59001	59033
	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

Extended Market Data Service (EMDS)	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
				US-allowed	US-restricted
	Ticker Feed	224.0.50.75	224.0.50.203	59000 Replay: 59001	59032 Replay: 59033
	Settlement prices	224.0.50.77	224.0.50.205		
	Intraday open interest data	224.0.50.78	224.0.50.206		
	Eurex T7 trades	224.0.50.79	224.0.50.207	Replay: 59001	Replay: 59033
	Source networks	193.29.89.192/28	193.29.89.208/28	-	

*Only applicable for DR scenario 2

RDI	Description	Mutlicast groups Service A	Multicast groups Service B [(*)]	Ports
	Multicast groups	224.0.50.0	224.0.50.128	Snapshot: 59098
	Multicast groups	224.0.50.1	224.0.50.129	Incremental: 59099
	Source networks	193.29.89.192/28	193.29.89.208/28	-

*Only applicable for DR scenario 2

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

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Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	193.29.90.128/27		
	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
	Leased line - side B(*)	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

Common Upload Engine - Area B	Connection option	Gateway IP address	IP subnets	Port
	Internet	193.29.90.158	193.29.90.128/27	
	Leased line - side A	193.29.90.88	193.29.90.64/27	2261
	Leased line - side B(*)	193.29.90.119	193.29.90.64/27	

*Only applicable for DR scenario 2

Table 3: Eurex T7 network details in DR scenario, part 3/3

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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
GUI Landing Page	Internet	https://t7gui.emergency.eurex.com/xeee/index.html 193.29.90.181		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.eurex.com/xeee/index.html 193.29.93.168		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.eurex.com/xeee/jnlp 193.29.90.181		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.vpn.eurex.com/xeee/jnlp 193.29.93.168		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.235 193.29.90.236	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.89.225	193.29.89.224/28	80 / 8089	TCP/IP
GUI (Crypto)Proxies	Leased line - side B	193.29.95.225	193.29.95.224/28	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.89.65 (active)	193.29.89.97 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf01a.emergency.vpn.eurex.com 193.29.89.65 (active)	fixlf01b.emergency.vpn.eurex.com 193.29.89.97 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [*]	Ports	
All T7 broadcast interfaces	Rendezvous points	193.29.91.252/32	193.29.91.253/32	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

[*] Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports	
				US-allowed	US-restricted
MDI	Multicast groups	224.0.50.66	224.0.50.194	59000	59032
MDI	Source networks	193.29.89.192/28	193.29.89.208/28	-	

[*] Only applicable for DR scenario 2

Table 4: EEX T7 network details in DR scenario, part 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
				US-allowed	US-restricted
	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

RDI	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
	Multicast groups	224.0.29.0	224.0.30.0	Snapshot: 59098
	Multicast groups	224.0.29.1	224.0.30.1	Incremental: 59099
	Source networks	193.29.89.192/28	193.29.89.208/28	-

*Only applicable for DR scenario 2

Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	193.29.90.128/27		
	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
	Leased line - side B(*)	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

Common Upload Engine - Area B	Connection option	Gateway IP address	IP subnets	Port
	Internet	193.29.90.158	193.29.90.128/27	
	Leased line - side A	193.29.90.88	193.29.90.64/27	2261
	Leased line - side B(*)	193.29.90.119	193.29.90.64/27	

*Only applicable for DR scenario 2

Table 5: 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 (XETR).

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xetr/index.html 193.29.90.178		443	TCP/IP
	Leased line	https://t7gui.emergency.vpn.xetra.com/xetr/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xetr/jnlp 193.29.90.178		443	TCP/IP
	Leased line	https://t7gui.emergency.xetra.com/xetr/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	193.29.90.224/27	80	TCP/IP
	Leased line - side A	193.29.94.225	193.29.94.224/29	80 / 8089	TCP/IP
	Leased line - side B	193.29.94.233	193.29.94.232/29		

	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	PS trading GW - Partition 30	193.29.94.130 (active)	193.29.94.162 (stand-by)	19043	TCP/IP
	PS trading GW - Partition 31	193.29.94.129 (active)	193.29.94.161 (stand-by)		
	PS trading GW - Partition 32	193.29.94.131 (active)	193.29.94.163 (stand-by)		
	PS trading GW - Partition 33	193.29.94.132 (active)	193.29.94.164 (stand-by)		
	PS trading GW - Partition 34	193.29.94.133 (active)	193.29.94.165 (stand-by)		
	LF trading gateways	193.29.94.65	193.29.94.97	19006	TCP/IP

	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.94.65 (stand-by)	193.29.94.97 (active)	19024	TCP/IP
	FIX LF gateway (encrypted)	fixlf01a.emergency.vpn.xetra.com 193.29.94.65 (stand-by)	fixlf01b.emergency.vpn.xetra.com 193.29.94.97 (active)	19017	TCP/IP

	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
MDI	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 scenario 2

Table 6: Xetra T7 network details in DR scenario, part 1/2

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EMDI

Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
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 scenario 2

EOBI

Description	Multicast groups Service A	Ports
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 Environment only (no re-use of production address range)

Extended Market Data Service (EMDS)

Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
All Trade Prices (ATP)	224.0.161.64	224.0.163.64	59000 Replay: 59001
Ticker feed	224.0.161.31	224.0.163.31	59000
Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

RDI

Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
Multicast groups	224.0.161.0	224.0.163.0	Snapshot: 59098 Incremental: 59099
Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

Common Report Engine

Connection option	Gateway IP address	IP subnets	Ports Public	Particip.
Internet	193.29.90.132	193.29.90.128/27		
Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
Leased line - side B(*)	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

Common Upload Engine - Area B

Connection option	Gateway IP address	IP subnets	Port
Internet	193.29.90.158	193.29.90.128/27	
Leased line - side A	193.29.90.88	193.29.90.64/27	2261
Leased line - side B(*)	193.29.90.119	193.29.90.64/27	

*Only applicable for DR scenario 2

Table 7: Xetra T7 network details in DR scenario, part 2/2

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xfra/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xfra/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xfra/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xfra/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.253	193.29.90.224/27	82	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.254	193.29.90.224/27	82	TCP/IP
GUI (Crypto)Proxies	Leased line - side A	193.29.94.227	193.29.94.224/29	82 / 8091	TCP/IP
GUI (Crypto)Proxies	Leased line - side B	193.29.94.235	193.29.94.232/29	82 / 8091	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	LF trading gateways	193.29.94.66	193.29.94.98	16006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.94.66 (active)	193.29.94.98 (stand-by)	16024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf11a.emergency.vpn.xetra.com 193.29.94.66 (active)	fixlf11b.emergency.vpn.xetra.com 193.29.94.98 (stand-by)	16017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 56086	B: 56087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
MDI	Multicast groups	224.0.161.40-47	224.0.163.40-47	56000	
MDI	Source networks	193.29.94.192/28	193.29.94.208/28	-	

*Only applicable for DR scenario 2

Table 8: Börse Frankfurt T7 network details in DR scenario, part 1/2

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EOBI	Description	Multicast groups Service A	Ports
	Multicast groups **(**)**	224.0.173.224-239	Snapshot: 56000 Incremental: 56001
	Source networks	193.29.94.0/27	-

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

Extended Market Data Service (EMDS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	All Trade Prices (ATP)	224.0.161.72-75	224.0.163.72-75	56000 Replay: 56001
	Source networks	193.29.94.0/27	193.29.94.32/27	-

*Only applicable for DR scenario 2

RDI	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
	Multicast groups	224.0.161.9	224.0.163.9	Snapshot: 56098 Incremental: 56099
	Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	193.29.90.128/27		
	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
	Leased line - side B(*)	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

Common Upload Engine - Area B	Connection option	Gateway IP address	IP subnets	Port
	Internet	193.29.90.158	193.29.90.128/27	
	Leased line - side A	193.29.90.88	193.29.90.64/27	2261
	Leased line - side B(*)	193.29.90.119	193.29.90.64/27	

*Only applicable for DR scenario 2

Table 9: Börse Frankfurt T7 network details in DR scenario, part 2/2

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xvie/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xvie/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xvie/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xvie/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	PS trading GW - Partition 81	193.29.92.193 (active)	193.29.92.201 (stand-by)	19043	TCP/IP
ETI	LF trading gateways	193.29.92.209	193.29.92.217	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.209 (active)	193.29.92.217 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf31a.emergency.vpn.xetra.com 193.29.92.209 (active)	fixlf31b.emergency.vpn.xetra.com 193.29.92.217 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [*]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports
MDI	Multicast groups	224.0.161.32-36	224.0.163.32 - 36	59000
MDI	Source networks	193.29.92.176/29	193.29.92.184/29	-

*Only applicable for DR scenario 2

Table 10: Vienna T7 network details in DR scenario, part 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	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 scenario 2

EOBI	Description	Multicast groups Service A	Ports
	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 Environment only (no re-use of production address range)

Extended Market Data Service (EMDS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	All Trade Prices (ATP)	224.0.161.68	224.0.163.68	59000 Replay: 59001
	Ticker feed	224.0.161.39	224.0.163.39	59000
	Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

RDI	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
	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 scenario 2

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

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xmal/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xmal/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xmal/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xmal/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
GUI (Crypto)Proxies	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	80 / 8089	TCP/IP
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.210	193.29.92.218	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.210 (stand-by)	193.29.92.218 (active)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf21a.emergency.vpn.xetra.com 193.29.92.210 (stand-by)	fixlf21b.emergency.vpn.xetra.com 193.29.92.218 (active)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports
MDI	Multicast groups	224.0.161.50 - 51	224.0.163.50 -51	59000
MDI	Source networks	193.29.92.176/29	193.29.92.184/29	-

*Only applicable for DR scenario 2

Table 12: Malta T7 network details in DR scenario, part 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	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 scenario 2

EOBI	Description	Multicast groups Service A	Ports
	Multicast groups (**)	224.0.173.242-243	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	-

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

Extended Market Data Service (EMDS)	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	All Trade Prices (ATP)	224.0.161.77	224.0.163.77	59000 Replay: 59001
	Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

RDI	Description	Mutlicast groups service A	Multicast groups Service B (*)	Ports
	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 scenario 2

Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	193.29.90.128/27		
	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
	Leased line - side B(*)	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

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

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xbul/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xbul/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xbul/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xbul/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.210	193.29.92.218	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.210 (stand-by)	193.29.92.218 (active)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf21a.emergency.vpn.xetra.com 193.29.92.210 (stand-by)	fixlf21b.emergency.vpn.xetra.com 193.29.92.218 (active)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports
MDI	Multicast groups	224.0.161.48	224.0.163.48	59000
MDI	Source networks	193.29.92.176/29	193.29.92.184/29	-

*Only applicable for DR scenario 2

Table 14: Bulgaria T7 network details in DR scenario, part 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports
	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 scenario 2

EOBI	Description	Multicast groups Service A	Ports
	Multicast groups [**]	224.0.173.240-241	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	-

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

Extended Market Data Service (EMDS)	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports
	All Trade Prices (ATP)	224.0.161.76	224.0.163.76	59000 Replay: 59001
	Ticker feed	224.0.161.49	224.0.163.49	59000
	Source networks	193.29.94.192/28	193.29.94.208/28	-

*Only applicable for DR scenario 2

RDI	Description	Mutlicast groups service A	Multicast groups Service B [*]	Ports
	Multicast groups	224.0.161.7	224.0.163.7	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.92.176/29	193.29.92.184/29	

*Only applicable for DR scenario 2

Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	193.29.90.128/27		
	Leased line - side A	193.29.90.67	193.29.90.64/27	2221	2222
	Leased line - side B [*]	193.29.90.99	193.29.90.64/27		

*Only applicable for DR scenario 2

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

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xbud/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xbud/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xbud/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xbud/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.209	193.29.92.217	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.209 (active)	193.29.92.217 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf31a.emergency.vpn.xetra.com 193.29.92.209 (active)	fixlf31b.emergency.vpn.xetra.com 193.29.92.217 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

[*]Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
MDI	Multicast groups	224.0.161.54 - 55	224.0.163.54 - 55	59000	
MDI	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 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports
	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**

EOBI	Description	Multicast groups Service A	Ports
	Multicast groups [**]	224.0.173.248-251	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	-

[**]**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)**

RDI	Description	Multicast groups service A	Multicast groups Service B [*]	Ports
	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 17: Budapest T7 network details in DR scenario, part 2/2

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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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xlju/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xlju/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xlju/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xlju/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.209	193.29.92.217	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.209 (active)	193.29.92.217 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf31a.emergency.vpn.xetra.com 193.29.92.209 (active)	fixlf31b.emergency.vpn.xetra.com 193.29.92.217 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports	
MDI	Multicast groups	224.0.161.56 - 57	224.0.163.56 - 57	59000	
MDI	Source networks	193.29.92.176/29	193.29.92.184/29	-	

*Only applicable for DR scenario 2

Table 18: Ljubljana T7 network details in DR scenario, part 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	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 scenario 2

EOBI	Description	Multicast groups Service A	Ports
	Multicast groups (**)	224.0.173.252-253	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	-

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

RDI	Description	Multicast groups service A	Multicast groups Service B (*)	Ports
	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 scenario 2

Table 19: 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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xprg/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xprg/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xprg/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xprg/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 193.29.90.234	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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.209	193.29.92.217	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.209 (active)	193.29.92.217 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf31a.emergency.vpn.xetra.com 193.29.92.209 (active)	fixlf31b.emergency.vpn.xetra.com 193.29.92.217 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B [(*)]	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B [(*)]	Ports
MDI	Multicast groups	224.0.161.52 - 53	224.0.163.52 - 53	59000
MDI	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 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports
	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

EOBI	Description	Multicast groups Service A	Ports	
	Multicast groups (**)	224.0.173.244-247	Snapshot: 59000 Incremental: 59001	
	Source networks	193.29.92.64/27	-	

**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)

RDI	Description	Multicast groups service A	Multicast groups Service B (*)	Ports
	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 21: 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
GUI Landing Page	Internet	https://t7gui.emergency.xetra.com/xzag/index.html 193.29.90.178		443	TCP/IP
GUI Landing Page	Leased line	https://t7gui.emergency.vpn.xetra.com/xzag/index.html 193.29.93.162		443	TCP/IP
Java WebStart	Internet	https://t7gui.emergency.xetra.com/xzag/jnlp 193.29.90.178		443	TCP/IP
Java WebStart	Leased line	https://t7gui.emergency.xetra.com/xzag/jnlp 193.29.93.162		443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233 / 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
GUI (Crypto)Proxies	Leased line - side B	193.29.94.233	193.29.94.232/29	80 / 8089	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
ETI	Trading gateways (LF only)	193.29.92.209	193.29.92.217	19006	TCP/IP

Interface	Gateway type	IP addresses Side A	IP addresses Side B	Ports	Protocol
FIX LF interface	FIX LF gateway	193.29.92.209 (active)	193.29.92.217 (stand-by)	19024	TCP/IP
FIX LF interface	FIX LF gateway (encrypted)	fixlf31a.emergency.vpn.xetra.com 193.29.92.209 (active)	fixlf31b.emergency.vpn.xetra.com 193.29.92.217 (stand-by)	19017	TCP/IP

Interface	Description	Rendezvous point Side A	Rendezvous point Side B (*)	Ports	
All T7 broadcast interfaces	Rendezvous points	185.102.253.252	185.102.253.253	-	
All T7 broadcast interfaces	Technical heartbeat	-	-	A: 59086	B: 59087

*Only applicable for DR scenario 2

Interface	Description	Multicast groups Service A	Multicast groups Service B (*)	Ports	
MDI	Multicast groups	224.0.161.58 - 59	224.0.163.58 - 59	59000	
MDI	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 1/2

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EMDI	Description	Multicast groups Service A	Multicast groups Service B [*]	Ports
	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**

EOBI	Description	Multicast groups Service A	Ports
	Multicast groups [**]	224.0.173.254-255	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.92.64/27	-

[**]**Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)**

RDI	Description	Mutlicast groups service A	Multicast groups Service B [*]	Ports
	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 23: 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 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: 15.10.2022 > trade date: 14.10.2022)

Please note: Changes done to these reference data will **not** 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 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:	13:00h 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 #####[2] <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.

- **or** a successful session or trader login via FIX LF 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)
  Please note: 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)
  Please note: 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: DR environment number = 45
       Example: 45FILRDF01PUBLI20220709XEUR9SHMT001.XML.ZIP

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[2] Depends on the respective exchange (Eurex, Xetra, etc)

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- XFRA: DR environment number = 41
    Example: 41FILRDF05PUBLI20220709XFRA9SKWJ000.XML.ZIP

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: FIX LF interface

During the disaster recovery test exercise, participants have to

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

Participants will be able to

- access all instruments
- add orders
- modify orders
- delete orders

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- match orders (not applicable for XFRA)

5.8 DR test exercise: Trader/Admin/Clearer GUI

During the disaster recovery test exercise, participants have to

- use DR landing pages URLs described in chapter 4
- 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.

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5.11 Support

The Technical Key Account Managers will be available for supporting the disaster recovery test exercise via your individual VIP number from 13:00h CE(S)T until 18:00h CE(S)T.

5.12 Interfaces out of scope

The following T7 interfaces will <u>not</u> be available during the DR test exercise:

- Extended Market Data Service
- Market Signals (MS)

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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 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
2021-2.2	3,4,5	30 November 2021	Updated FIX LF entries (from "back-office only" to full-fledged) Added new partitions for Eurex and Xetra
2022-1.0	3.1, 4	28 February 2022	Changed trade offset from 10.000.000 to 5.000.000 Updated GUI landing pages (all markets) Updated ETI LF gateway IP addresses for cash

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			markets partner exchanges
			Added Common Upload Engine
2022-1.1	4, 5.12	13 June 2022	Deleted "old" FIX gateways, updated FIX LF gateway IP addresses for cash markets partner exchanges, updated GUI IP addresses and URLs
2022-1.2	4	15 August 2022	Added payload encryption service for FIX LF gateways