

T7 Disaster Recovery Concept 2021

Interface Configuration Details

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Table of Content

1 Introduction 1

2 Disaster recovery scenarios 2
2.1 Status quo 2
2.2 DR scenario 1 - Total loss of primary data centre 3
2.3 DR scenario 2 - Partial loss of primary data centre, co-location still accessible 4

3 General considerations 5
3.1 Functional 5
3.2 Configuration for DR 6
3.2.1 Same as Production 6
3.2.2 Differ from Production 6
3.2.2.1 Enhanced Order Book Interface (EOBI) 7
3.3 Return to Production 7

4 Disaster recovery network details 8
4.1 Ping test 8
4.2 T7 network details derivatives markets 9
4.2.1 Eurex T7 9
4.2.2 EEX T7 11
4.3 T7 network details cash markets 13
4.3.1 Xetra T7 13
4.3.2 Börse Frankfurt T7 15
4.3.3 Vienna T7 17
4.3.4 Malta T7 19
4.3.5 Bulgaria T7 21
4.3.6 Budapest T7 23
4.3.7 Ljubljana T7 25
4.3.8 Prague T7 27
4.3.9 Zagreb T7 29

5 Disaster recovery test script 31
5.1 Disaster recovery test scenario 31
5.2 Schedule of the disaster recovery test 31
5.3 Success criteria for the disaster recovery test 32
5.4 DR test exercise: Availability market data 32
5.5 DR test exercise: Availability reference data 32
5.6 DR test exercise: Enhanced Transaction Interface (ETI) 33
5.7 DR test exercise: New FIX LF interface (back office session) 33
5.8 DR test exercise: Trader/Admin/Clearer GUI 33
5.9 DR test exercise: Common Report Engine (CRE) 34

5.10 Re-connection test 34
5.11 Support 34
5.12 DR test exercise: Interfaces out of scope 34

6 Change log 35

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 -> Tech -> T7 Trading architecture -> Release 9.0 -> Network Access

www.xetra.com -> Technology -> T7 Trading architecture -> System documentation -> Release 9.0 -> Network Access

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.)

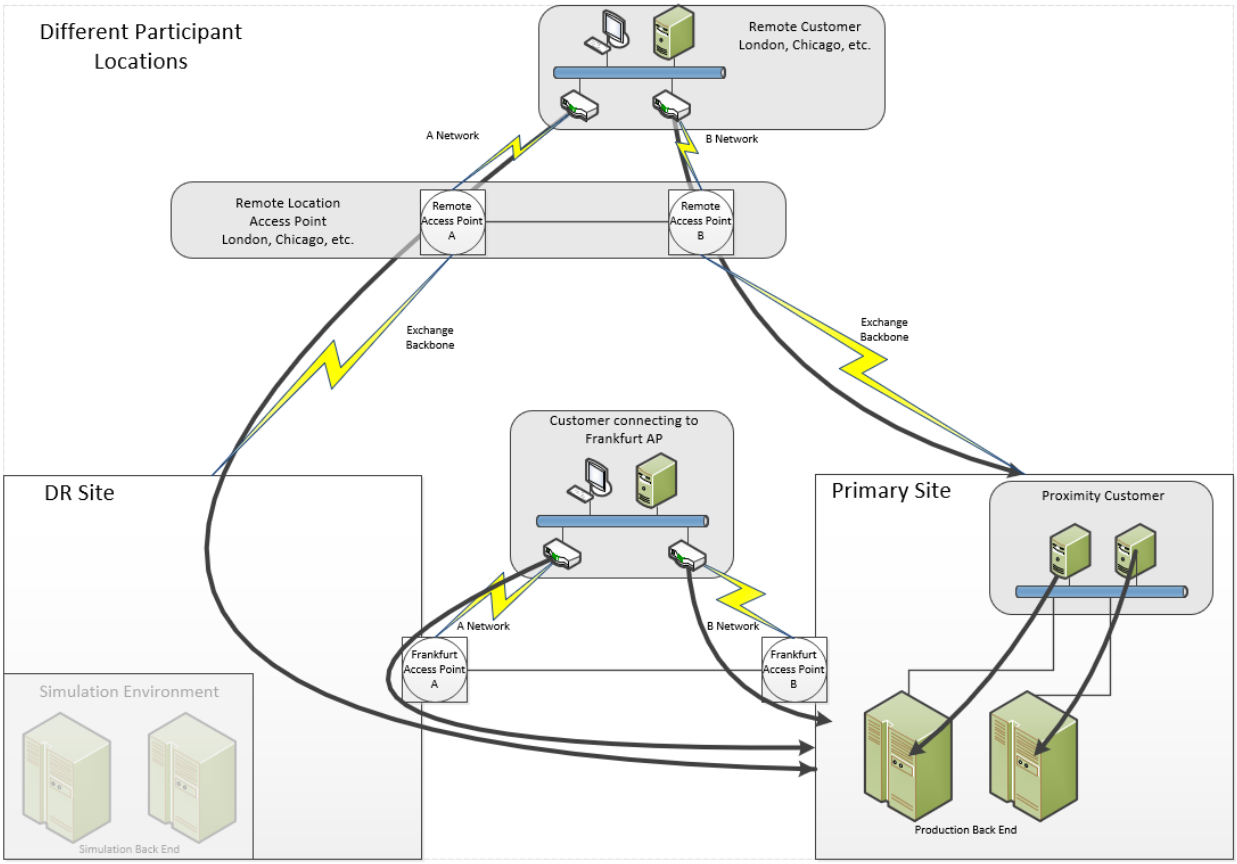


Figure 1: All three types of customer installations and their redundant connectivity to the T7 production back ends.

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.

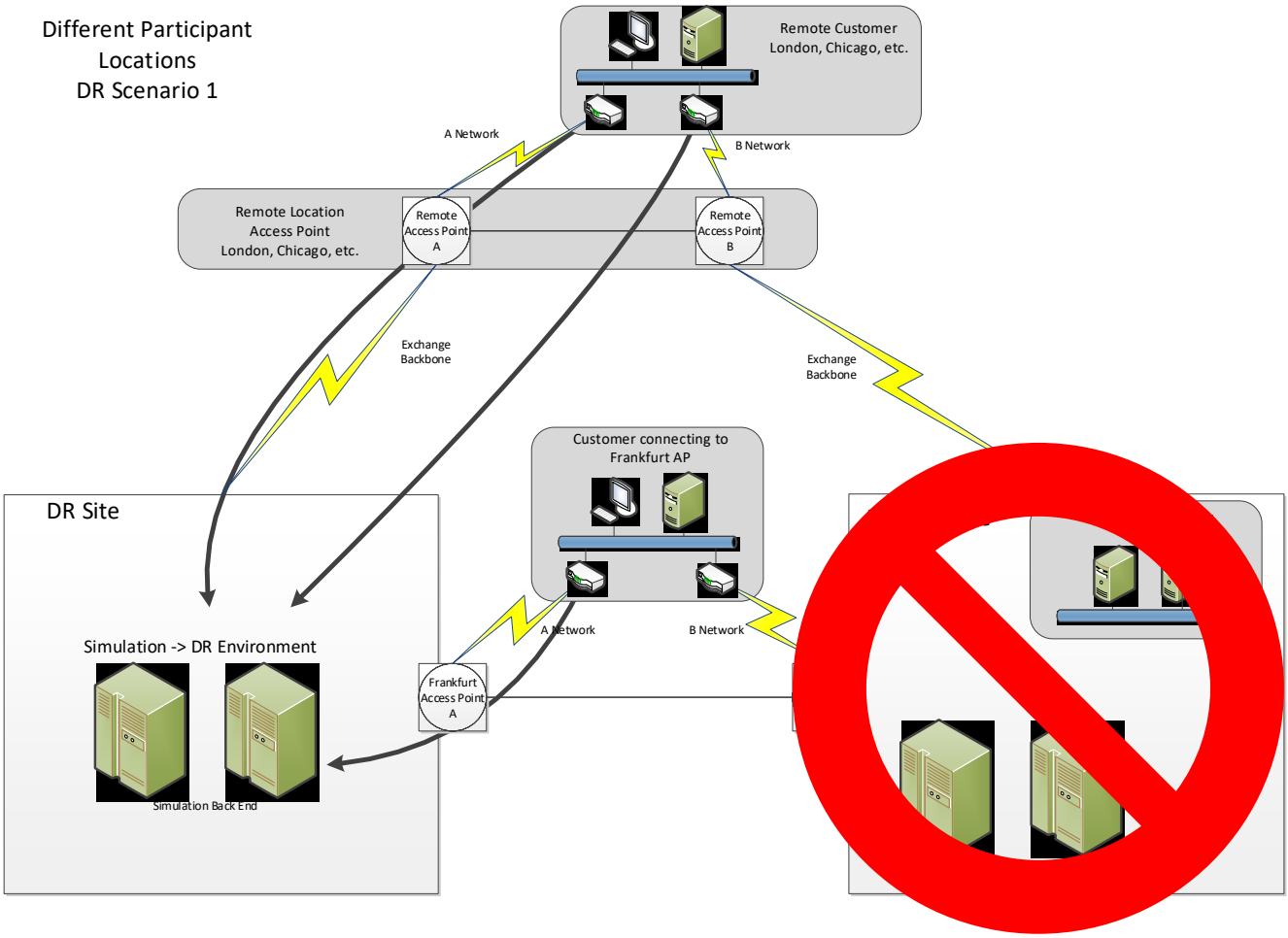


Figure 2: Disaster recovery scenario 1

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 DR 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 DR data centre.

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

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.

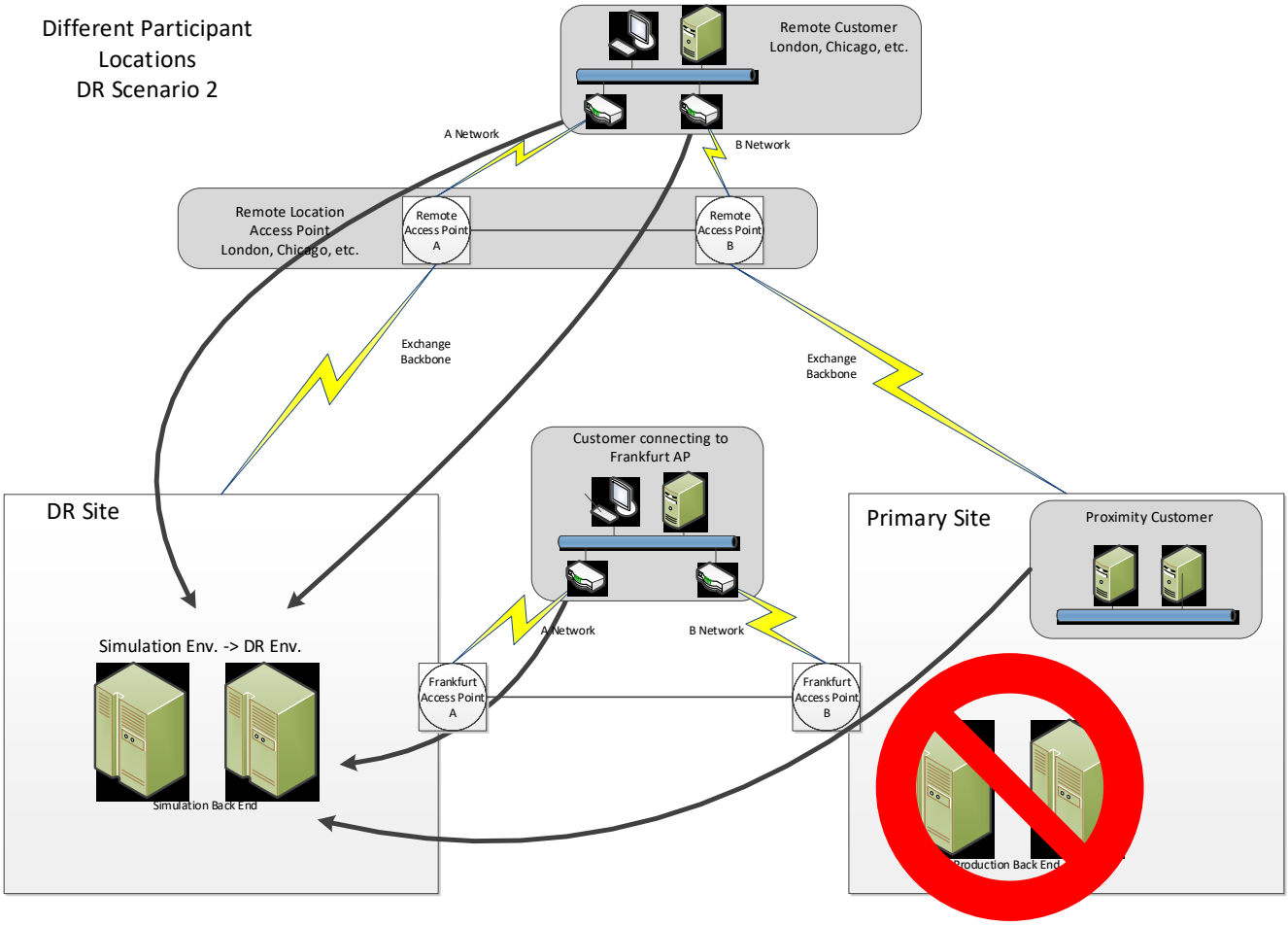


Figure 3: Disaster recovery scenario 2

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 DR 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 DR data centre.

Co-location customers will be able to continue to use their existing connection to the access point half located in the DR data centre.

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. All Trades reported in DR will start from 1 again. Timestamps must be used to detect duplicate trade IDs in the clearing systems.
- 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.

3.2 Configuration for DR

3.2.1 Same as Production

- User IDs, ETI and FIX 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: A Side Subnet will be the same as for normal production.
- Stream-A multicast groups will be the same as for normal production for the following T7 broadcast interfaces:
    - Market Data Interface (MDI)
    - Enhanced Market Data Interface (EMDI)
    - Extended Market Data Service (EMDS)
    - Market Signals (MS) - derivatives market only
    - Reference Data Interface (RDI)
- Stream-A Rendezvous Point (RP) will be the same as for normal production.
- Stream-A Technical Heartbeat will be the same as for normal production.
- 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[1] 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.
- Source IP addresses will differ from regular production for the following T7 broadcast interfaces:
    - Market Data Interface (MDI)
    - Enhanced Market Data Interface (EMDI)
    - Enhanced Order Book Interface (EOBI)
    - Extended Market Data Service (EMDS)
    - Market Signals (MS) - derivatives market only
    - Reference Data Interface (RDI)

[1] The new FIX LF interface will be integrated closer into the T7 architecture by providing similar underlying infrastructure and functional/technical characteristics as the existing ETI interface, e.g. backward compatibility. The new FIX LF interface will initially be offered in parallel to the existing FIX Gateway interface and will, after individual transition periods, ultimately replace the existing FIX Gateway interface.

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 chapter 4 for network details). Please make sure that your internal firewall settings are adjusted accordingly.

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.

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).

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 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.

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.

Interface	Connection option	URL / IP addresses	IP subnets	Ports	Protocol
GUI Landing Page	Internet	http://webgui.eurexchange.com/emergency		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.eurexchange.com/emergency		80 / 443	TCP/IP
		http://webgui.vpn.eurexchange.com/emergency/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.190	-	80 / 443	TCP/IP
	Leased line	193.29.93.173	193.29.93.160/28	80 / 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 adresses Side A**	**IP adresses 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)		
	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.150.253.31	90.150.253.0 / 24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.89.65	193.29.89.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	193.29.91.252/32	-		
	Technical heartbeat Service A only	-	59086		

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

	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
MDI	Multicast groups	224.0.50.64-65 224.0.50.67-74 224.0.29.72-76	59000	59032
	Source networks	193.29.89.192/28	-	

	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
EMDI	Multicast groups	224.0.50.2-9 224.0.50.12-63 224.0.29.2-55	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.89.0/27	-	

	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
EOBI	Multicast groups[1]	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	-	

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

	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
Market Signals	Reference Data	224.0.114.1	59000	-
	Eurex IOC liquidity Indicator for Options	224.0.114.128	59001	59033
	Risk Alerts	224.0.114.134	59001	59033
	Source networks	193.29.89.0/27	-	

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

	Description	Mutlicast groups service A	Ports
RDI	Multicast groups	224.0.50.0	Snapshot: 59098
	Multicast groups	224.0.50.1	Incremental: 59099
	Source networks	193.29.89.192/28	-

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

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

4.2.2 EEX T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.eurexchange.com/emergency/eex		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.eurexchange.com/emergency/eex		80 / 443	TCP/IP
		http://webgui.vpn.eurexchange.com/emergency/eex/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.190	-	80 / 443	TCP/IP
	Leased line	193.29.93.173	193.29.93.160/28	80 / 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 adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.89.65 193.29.89.66	193.29.89.97 193.29.89.98	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.150.253.31	90.150.253.0 / 24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.89.65	193.29.89.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	193.29.91.252/32	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
	Multicast groups	224.0.50.66	59000	59032
	Source networks	193.29.89.192/28	-	-

EMDI	Description	Multicast groups Service A	Ports	
			US-allowed products	US-restricted products
	Multicast groups	224.0.50.10 224.0.50.11	Snapshot: 59000 Incremental: 59001	Snapshot: 59032 Incremental: 59033
	Source networks	193.29.89.0/27	-	

RDI	Description	Mutlicast groups service A	Ports
	Multicast groups	224.0.29.0	Snapshot: 59098
	Multicast groups	224.0.29.1	Incremental: 59099
	Source networks	193.29.89.192/28	-

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

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

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		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	PS trading GW - Partition 30	193.29.94.129 (active)	193.29.94.161 (stand-by)	19043	TCP/IP
	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
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI

Description	Multicast groups Service A	Ports
Multicast groups	224.0.161.16 - 22	59000
Source networks	193.29.94.192/28	-

EMDI

Description	Multicast groups Service A	Ports
Multicast groups	224.0.160.0 - 63	Snapshot: 59000 Incremental: 59001
Source networks	193.29.94.0/27	-

EOBI

Description	Multicast groups Service A	Ports
Multicast groups[1]	224.0.173.128-191	Snapshot: 59000 Incremental: 59001
Source networks	193.29.94.0/27	-

[1]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	Ports
All Trade Prices (ATP)	224.0.161.64	59000 Replay: 59001
Ticker feed	224.0.161.31	59000
Source networks	193.29.94.192/28	-

RDI

Description	Mutlicast groups service A	Ports
Multicast groups	224.0.161.0	Snapshot: 59098 Incremental: 59099
Source networks	193.29.94.192/28	-

Common Report Engine

Connection option	Gateway IP address	IP subnets	Ports	
			Public	Particip.
Internet	193.29.90.132	-	2221	2222
Leased line - side A	193.29.90.67	193.29.90.64/27		

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

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		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xfra		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xfra		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xfra/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.253	193.29.90.224/27	82	TCP/IP
		193.29.90.254			
	Leased line - side A	193.29.94.227	193.29.94.224/29	82 / 8091	TCP/IP
	Leased line - side B	193.29.94.235	193.29.94.232/29		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.66	193.29.94.98	16006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.196	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.66	193.29.94.98	16024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	56086		

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

MDI	Description	Multicast groups Service A	Ports		
	Multicast groups	224.0.161.40-47	56000		
	Source networks	193.29.94.192/28	-		
EOBI	Description	Multicast groups Service A	Ports		
	Multicast groups[1]	224.0.173.224-239	Snapshot: 56000 Incremental: 56001		
	Source networks	193.29.94.0/27	-		
	[1]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	Ports		
	All Trade Prices (ATP)	224.0.161.72-75	56000 Replay: 56001		
	Source networks	193.29.94.192/28	-		
RDI	Description	Mutlicast groups service A	Ports		
	Multicast groups	224.0.161.9	Snapshot: 56098 Incremental: 56099		
	Source networks	193.29.94.192/28	-		
Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports Public	Ports Particip.
	Internet	193.29.90.132	-	2221	2222
	Leased line - side A	193.29.90.67	193.29.90.64/27		

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

4.3.3 Vienna T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xvie		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xvie		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xvie/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

	Description	Multicast groups Service A	Ports
MDI	Multicast groups	224.0.161.32-36	59000
	Source networks	193.29.94.192/28	-
	Description	**Multicast groups Service A**	**Ports**
EMDI	Multicast groups	224.0.160.64-73	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	Description	**Multicast groups Service A**	**Ports**
EOBI	Multicast groups[1]	224.0.173.192-201	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	[1]Multicast address range of EOBI is dedicated to Disaster Recovery Environment only (no re-use of production address range)		
	Description	**Multicast groups Service A**	**Ports**
Extended Market Data Service (EMDS)	All Trade Prices (ATP)	224.0.161.68	59000 Replay: 59001
	Ticker feed	224.0.161.39	59000
	Source networks	193.29.94.192/28	-
	Description	**Mutlicast groups service A**	**Ports**
RDI	Multicast groups	224.0.161.1	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.94.192/28	-

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

4.3.4 Malta T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xmal		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xmal		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xmal/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	Description	Multicast groups Service A	Ports		
	Multicast groups	224.0.161.50-51	59000		
	Source networks	193.29.94.192/28	-		
EMDI	Description	Multicast groups Service A	Ports		
	Multicast groups	224.0.160.114-115	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.94.0/27	-		
EOBI	Description	Multicast groups Service A	Ports		
	Multicast groups[1]	224.0.173.242-243	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.94.0/27	-		
	[1]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	Ports		
	All Trade Prices (ATP)	224.0.161.77	59000 Replay: 59001		
	Source networks	193.29.94.192/28	-		
RDI	Description	Mutlicast groups service A	Ports		
	Multicast groups	224.0.161.8	Snapshot: 59098 Incremental: 59099		
	Source networks	193.29.94.192/28	-		
Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports Public	Ports Particip.
	Internet	193.29.90.132	-	2221	2222
	Leased line - side A	193.29.90.67	193.29.90.64/27		

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

4.3.5 Bulgaria T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landingpage	Internet	http://webgui.xetra.com/emergency/xbul		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xbul		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xbul/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	Description	Multicast groups Service A	Ports		
	Multicast groups	224.0.161.48	59000		
	Source networks	193.29.94.192/28	-		
EMDI	Description	Multicast groups Service A	Ports		
	Multicast groups	224.0.160.112-113	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.94.0/27	-		
EOBI	Description	Multicast groups Service A	Ports		
	Multicast groups[1]	224.0.173.240-241	Snapshot: 59000 Incremental: 59001		
	Source networks	193.29.94.0/27	-		
	[1]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	Ports		
	All Trade Prices (ATP)	224.0.161.76	59000 Replay: 59001		
	Ticker feed	224.0.161.49	59000		
	Source networks	193.29.94.192/28	-		
RDI	Description	Mutlicast groups service A	Ports		
	Multicast groups	224.0.161.7	Snapshot: 59098 Incremental: 59099		
	Source networks	193.29.94.192/28	-		
Common Report Engine	Connection option	Gateway IP address	IP subnets	Ports	
				Public	Particip.
	Internet	193.29.90.132	-	2221	2222
	Leased line - side A	193.29.90.67	193.29.90.64/27		

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

4.3.6 Budapest T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xbud		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xbud		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xbud/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.161.54-55	59000
	Source networks	193.29.94.192/28	-
EMDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.160.120-123	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
EOBI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups[1]	224.0.173.248-251	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	[1]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**	**Ports**
	Multicast groups	224.0.161.4	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.94.192/28	-

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

4.3.7 Ljubljana T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xlju		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xlju		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xlju/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.161.56-57	59000
	Source networks	193.29.94.192/28	-
EMDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.160.124-125	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
EOBI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups[1]	224.0.173.252-253	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	[1]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**	**Ports**
	Multicast groups	224.0.161.5	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.94.192/28	-

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

4.3.8 Prague T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xprg		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xprg		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xprg/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

	Description	Multicast groups Service A	Ports
MDI	Multicast groups	224.0.161.52-53	59000
	Source networks	193.29.94.192/28	-
EMDI	Description	Multicast groups Service A	Ports
	Multicast groups	224.0.160.116-119	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
EOBI	Description	Multicast groups Service A	Ports
	Multicast groups[1]	224.0.173.244-247	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	[1]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	Ports
	Multicast groups	224.0.161.3	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.94.192/28	-

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

4.3.9 Zagreb T7

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

Interface	Connection option	URL / IP addresses		Ports	Protocol
GUI Landing Page	Internet	http://webgui.xetra.com/emergency/xzag		80 / 443	TCP/IP
	Leased line	http://webgui.vpn.xetra.com/emergency/xzag		80 / 443	TCP/IP
		http://webgui.vpn.xetra.com/emergency/xzag/fqdn.html		80 / 443	TCP/IP
Java WebStart	Internet	193.29.90.189	-	80 / 443	TCP/IP
	Leased line	193.29.93.174	-	80 / 443	TCP/IP
GUI (Crypto)Proxies	Internet	193.29.90.233	193.29.90.224/27	80	TCP/IP
		193.29.90.234			
	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		
ETI	**Gateway type**	**IP subnets Side A**	**IP subnets Side B**	**Ports**	**Protocol**
	Trading gateways (LF only)	193.29.94.65	193.29.94.97	19006	TCP/IP
FIX Gateway (old)	**Connection option**	**IP addresses**	**IP subnets**	**Ports**	**Protocol**
	Leased line - side A	90.152.253.41	90.152.253.0/24	Individually assigned	TCP/IP
New FIX LF interface	**Gateway type**	**IP adresses Side A**	**IP adresses Side B**	**Ports**	**Protocol**
	LF trading gateways	193.29.94.65	193.29.94.97	19024	TCP/IP
All T7 broadcast interfaces	**Description**	**Rendezvous points**	**Ports**		
	Rendezvous points Service A only	185.102.253.252	-		
	Technical heartbeat Service A only	-	59086		

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

MDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.161.58-59	59000
	Source networks	193.29.94.192/28	-
EMDI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups	224.0.160.126-127	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
EOBI	**Description**	**Multicast groups Service A**	**Ports**
	Multicast groups[1]	224.0.173.254-255	Snapshot: 59000 Incremental: 59001
	Source networks	193.29.94.0/27	-
	[1]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**	**Ports**
	Multicast groups	224.0.161.6	Snapshot: 59098 Incremental: 59099
	Source networks	193.29.94.192/28	-

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

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 and ETI sessions.

Trade date for the DR test exercise is DR test date – 1 business day (e.g. DR test date: 17.04.2021 > trade date: 16.04.2021)

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 (FR2).

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.

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

Start DR test:	14:00h CET
End DR test:	16:00h CET
Start re-connection test:	17:00h CET
End re-connection test:	18:00h CET

5.3 Success criteria for the disaster recovery test

The disaster recovery test exercise can be regarded as successful when

- 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 GUI or the T7 Admin GUI **or** a successful session or trader login via ETI has been performed.
- MDI/EMDI/EOBI/RDI heartbeats have been received.

5.4 DR test exercise: Availability 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 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 (see chapter 3.2.2.1 for details).

5.5 DR test exercise: Availability 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).
  Please note: Unlike to a real DR situation, the RDF will **not** be transferred via Common Report Engine (CRE) but only provided by your Technical Key Account Manager via email on request.

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

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 newsboard messages
- access all instruments
- add orders/quotes
- modify orders/quotes
- delete orders/quotes
- match orders/quotes

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

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

Participants will be able to

- receive newsboard messages

Trader GUI only:

- receive price information
- access all instruments
- add orders
- modify orders

- delete orders
- match orders

5.9 DR test exercise: Common Report Engine (CRE)

Participants will be able to access the Common Report Engine. However, neither reports will be generated during the disaster recovery test exercise nor RDF will be distributed to CRE in the cause of this test.

5.10 Re-connection test

After the disaster recovery test exercise has been completed, the regular production environment will be made available from 17:00h CET until 18:00h CET 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 CET until 18:00h CET.

5.12 DR test exercise: Interfaces out of scope

The following T7 interfaces will not be available during the DR test exercise:

- Extended Market Data Service
- Market Signals (MS)
- Existing FIX Gateway interface implementation

Please note: The new FIX LF interface will be **in scope**

The Clearing systems C7 and CCP are not participating in the DR test exercise. No data generated during a DR test exercise is forwarded to any Clearing system.

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