Deutsche Börse Group’s T7

T7 Release 14.0 - Trader, Admin and Clearer GUI

Installation Manual

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1. Introduction

There are currently three different graphical user interfaces (GUIs) with different purposes for the T7 trading system:

- The T7 Trader GUI which is used for On-exchange trading and T7 Entry services.
- The T7 Admin GUI which is used for trader maintenance, entitlement, and transaction size limit settings.
- The T7 Clearer GUI allows clearing members to monitor the trades of their non-clearing members. Additionally, it implements a function which allows clearing members to halt further trading of their non-clearing members.

These T7 GUIs are JavaFX applications and require a locally installed Java Runtime SE (JRE-FX) version 8 (at least update 161 or newer version of JRE 8) on the client computer.
Please note, the T7 GUIs are designed to be run by JRE version 8. JRE versions beyond version 8 (i.e., JRE 11) are neither supported nor recommended.

Java Runtime environments can be obtained from various sources. Besides the JRE offered by Oracle, Deutsche Börse offers a dedicated JRE (Zulu by Azul.com) to run the T7 GUIs for download in the DBAG Member Section.

For users of the Oracle Java SE, please consider Oracle's Java SE Support Roadmap, available on Oracle´s website:

https://www.oracle.com/technetwork/java/javase/eol-135779.html

Deutsche Börse offers two options to start the T7 GUIs ensuring that the T7 GUIs will always update to the latest version automatically.

Java Web Start which is included in Oracle's Java 8 JRE or alternatively can be added by the open-source implementation "Open WebStart" (https://openwebstart.com - version 1.5.0 or newer required, latest version recommended (1.11.0) to other Java Runtime environments like the Zulu JRE by Azul.com.
Links to Java Web Start files are provided on the T7 GUI Landing Pages.

For users looking for an alternative to Java WebStart, or Open WebStart, Deutsche Börse offers a proprietary solution "T7 GUI Launcher" based on an open-source tool "getdown" by threerings[1] to ensure reliable and automatic update and download of the T7 GUIs.

The T7 GUI Launcher was introduced in 2019 as an alternative to the T7 GUI Landing Pages which are dependent on the Java Web Start mechanism.

Both mechanisms (WebStart based Landing Pages and proprietary GUI Launcher) will be available in parallel until further notice and can be used depending on the user's choice of Java Runtime.

All T7 GUIs can be used via leased line connections (using a GUI-Channel) or alternatively through the Internet (native Internet connection).

[1] See. https://github.com/threerings/getdown and https://github.com/threerings/getdown/blob/master/LICENSE

Internet connections require an additional security layer which requires the trading participant to create SSH key pairs and to upload the public key to the Member Section before using the GUIs over an Internet connection.

1.1 Document structure

Chapter 1 of this document outlines the general concept behind the T7 GUIs as well as the requirements on the client computer.

Chapter 2 outlines the steps to download and install the Java Runtime Environment provided by Deutsche Börse to run the T7 GUIs.

Chapter 3 describes the steps to download and install the T7 GUI Launcher.

Chapter 4 lists the URLS to T7 GUI Landing Pages for all marketplaces.

Chapter 5 summarizes details, procedures, and configurations to run the T7 GUIs after the T7 GUI Launcher has been installed. Details about the connecting network can be found in this chapter too.

Chapter 6 applies only to Internet connections and describes in detail several approaches for SSH key creation and the procedure to upload a created public key to the Member Sections of Eurex (for derivatives markets) and Xetra (for cash markets)

Chapter 7 summarizes several scenarios for testing and troubleshooting, together with links to further documentation.

1.2 T7 GUI Access via the T7 GUI Launcher

Since the initial launch of T7, the T7 GUIs were started using a mechanism called “Java Web Start” and most users have relied on the Java Runtime Environment SE distribution by Oracle.

Java Web Start was deprecated by Oracle in Java SE 9 and removed in Java SE 11.

Deutsche Börse has implemented an alternate solution so that trading participants are able to run and seamlessly update the T7 GUIs without the requirement for Oracle’s Java Web Start or Open WebStart.

Deutsche Börse has achieved a license agreement, which allows the deployment of a bundled Java SE 8 Runtime Environment that can be used by the T7 trading community to run the T7 GUIs without additional Java license requirements.

The “T7 GUI Launcher” is based on the open source getdown application. The “T7 GUI Launcher” is a small software utility, which must be installed on all computers which will be used to run the T7 GUIs.

Once the “T7 GUI Launcher” has been installed it will ensure that the T7 GUIs are updated automatically and seamlessly when a newer version of the T7 GUIs become available, ensuring that all users of the T7 system are always on the same software level.

The installation packages of the T7 GUI Launcher as well as the JRE version can be downloaded in the Member Sections of Eurex (for derivatives markets) and Xetra (for cash markets). See 3.2 for details on the download.

Please note: The “T7 GUI Launcher” only supports Microsoft Windows and will not be available for Linux or Mac OS.
The installation packages are offered on a marketplace basis (i.e., Eurex, EEX, Xetra, Börse Frankfurt, Xetra Partner Exchanges, Xetra Vienna and Vienna Partner Exchanges). The corresponding installation packages differ in terms of the respective environment (Production, Simulation and Disaster Recovery). Each package contains selection options for the connection alternatives (Leased Line and Internet).

Once installed the T7 GUIs are started by means of desktop shortcuts, which will be created during the installation of the specific T7 GUI launcher.

These desktop shortcuts linked to the various T7 GUIs point to specific batch files, which themselves trigger the T7 GUI Launcher mechanism to download and start the latest T7 GUI binary on the client computer.

1.2.1 Reasoning behind the T7 GUI Launcher

The T7 GUI Launcher was created as an alternative to the mechanism of T7 GUI Landing Pages and Java Web Start for customers who no longer want or can use the Java Web Start included in the Oracle Java 8 Runtime.

The introduction of the T7 GUI Launcher has been driven by Oracle’s announcement of the obsolescence of Java Web Start.

In the meantime, then open-source project Open WebStart (https://openwebstart.com) is providing a robust alternative implementation with builds for Windows, Linux and macOS. Beginning with version 1.5.0 Open WebStart is able to launch the T7 GUIs.

The decision which Java Runtime Environment distribution to run the T7 GUIs on, is driven by different factors. Oracle’s Java SE Support Roadmap affects the way Oracle’s Java Runtime environment can be used in commercial environments. For details, please see:

https://www.oracle.com/technetwork/java/javase/eol-135779.html

Please refer to Oracles Java SE Support Roadmap and your contractual relationship with Oracle to choose a suitable Java Runtime Environment distribution.

1.3 T7 GUI Access via the T7 GUI Landing Pages

The T7 GUI Landing Pages are simple HTML web pages, which provide links to Java Web Start files (JNLP files) which allow automatic download, update, and start of all T7 GUIs.

A locally installed Oracle Java Runtime Environment version 8 (> update 161) or alternatively an installation of Open WebStart (>1.5.0) together with the DBAG provided Azul Zulu JRE is required to make use of the Web Start mechanism and the JNLP files on these T7 GUI Landing Pages.

T7 GUI users who don’t want to use WebStart at all cannot use the JNLP files on the T7 GUI Landing Page and are required to switch to the “T7 GUI Launcher” (see 1.2).

The T7 GUI Landing Pages can be accessed by any browser and are provided for Internet and for Leased Line.

There are dedicated T7 GUI Landing Pages for Simulation, Production and Disaster Recovery for each market hosted on the T7 trading architecture (see 4).

1.4 Client PC requirements

To run the T7 GUIs, the T7 GUI Launcher and the underlying Java Runtime Environment, the client computer needs to meet several minimum requirements regarding the operating system version and the hardware specification.

Configurations, which have been used in internal testing within Deutsche Börse AG, are labeled as “Supported”. Additionally, there are configurations, which are considered “Possible” but were not tested by Deutsche Börse AG.

1.4.1 Operating system

T7 supports the following operating systems to be run the T7 GUIs:

- MS Windows (32-bit), x86 (MS Windows 10 & 11, MS Windows Server 2016)
- MS Windows (64-bit), x64 (MS Windows 10 & 11, MS Windows Server 2016)

1.4.2 Hardware

Recommended requirements for desktop computers running one T7 GUI:

- A computer capable of running the above listed operating systems and Java Runtime Environment with at least 4 GB memory and a dual-core processer that runs at least with 2 GHz.In

Please note: Display server solutions (i.e., Citrix) have not been tested but are considered possible.

1.4.3 Installation destination

It is recommended to install the T7 GUIs on local physical discs if possible.

If installation on local discs is not possible, it must be ensured that the remote drive is stable during the entire runtime of the T7 GUI.

Should the connection to the network drive be interrupted during the runtime of a T7 GUI, there is a risk that the GUI will fail/crash; typically, with a “Class not found” error message.

Depending on the installation method, the installation path is either the configured Java cache (java Web Start) or the selected installation directory (T7 GUI Launcher).

2. Java Runtime Environment (JRE)

All T7 GUIs require a Java Runtime Environment Version 8 (FX version) update 161 or newer version 8 to be present on the computer to run the GUIs.

Please note, the T7 GUIs are designed to be run by JRE version 8. JRE versions beyond version 8 (i.e., JRE 11) are neither supported nor recommended.

Java Runtime Environments can be obtained from various sources with various support options.

Deutsche Börse achieved a contract with Azul Systems (see http://azul.com) which allows Deutsche Börse to offer Azul's Open-Source Java Runtime "Zulu", to be used exclusively with the T7 GUIs and the T7 GUI Launcher.

Multiple different JREs can be installed on a client computer. Selection of a specific JRE is usually done by setting environment variables, either globally, on the operating system level, or specifically prior to running a specific Java application.

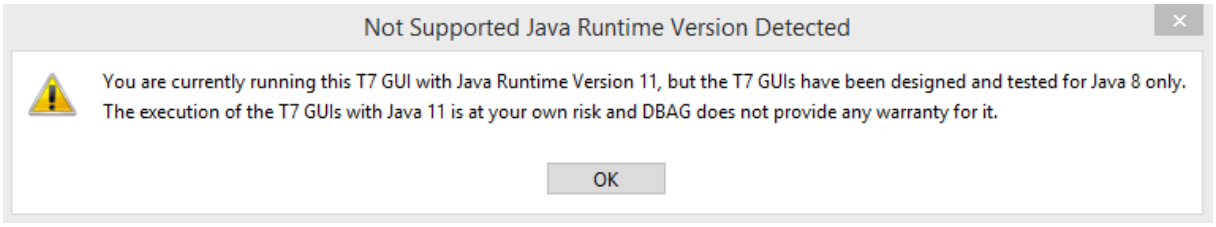
The type of Java Runtime present on the client computer decides which mechanism can be used to start the T7 GUIs:

- Non-Oracle Java Runtime -> T7 GUI Launcher only
- Non-Oracle Java Runtime with added Open WebStart -> T7 GUI Launcher or T7 GUI Landing Page
- Oracle Java Runtime -> T7 GUI Launcher or T7 GUI Landing Page

The following versions of the Java Virtual Machine are supported:

- Deutsche Börse's exclusively packaged Java SE 8 (FX version) Runtime Environment (only for T7 GUI applications) is recommended to be used when the T7 GUIs are started with the T7 GUI Launcher or via Open WebStart.
- Oracle Java Runtime Environment version 8) update 161 or newer version 8 can make use of both, Java Web Start and the T7 GUI Landing Pages. Please note, the JRE-FX version of the Oracle Java Runtime is required to run the T7 GUIs.

Please note: once launched, the T7 GUIs will present a warning in case a non-supported Java Runtime version is detected:



2.1 Downloading Deutsche Börse's packaged JRE

The latest version of Deutsche Börse's packaged JRE Version 8 can be downloaded from the DBAG member section under the following paths:

Xetra / Cash markets:

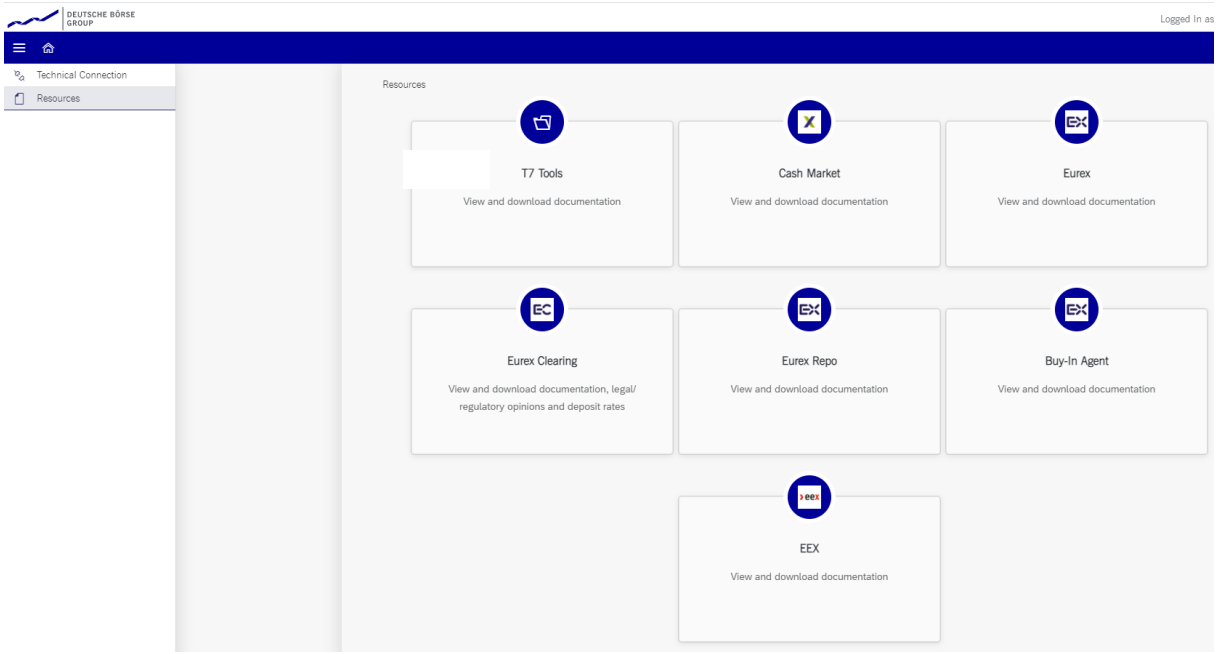
https://membersection.deutsche-boerse.com > Resources > Cash Market >

Documentation & Files > Xetra Software > Java Runtime

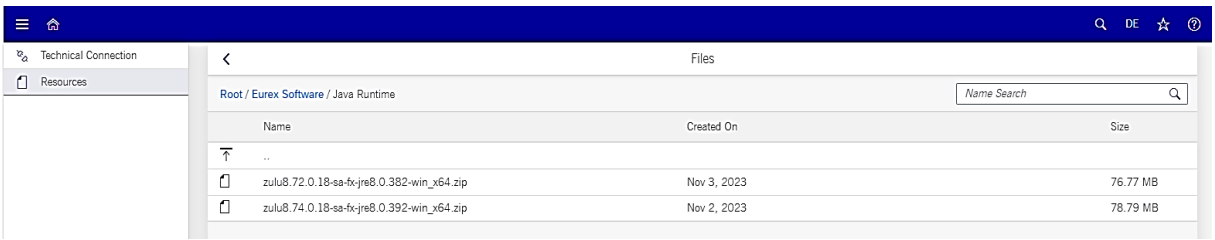
Eurex / Derivatives markets :

https://membersection.deutsche-boerse.com > Resources > Eurex >

Documentation & File > Eurex Software > Java Runtime



Usually the two most recent versions of the JRE are available for download:



Availability of new versions of the JRE are announced by Implementation News (see chapter 2.3).

2.2 Installing Deutsche Börse's packaged JRE

The JRE offered by Deutsche Börse is available in form of a single ZIP archive allowing manual extraction to a directory of choice.

Just download the ZIP archive and unpack it into a desired destination directory.

2.2.1 Post installation steps, selecting a specific JRE

Any locally installed JRE can be specified by environment variables. Three environment variables have relevance in specifying the desired JRE. Two of them are commonly used, independent of the application in question, and one, which is used only by the T7 GUIs.

- PATH — contains a list of directories used by operating system to look for ' executables of any kind.
- JAVA_HOME — commonly used variable to specify the location of a locally installed JRE or JDK. Applications like the T7 GUI Launcher batch files (i.e., EurexTraderLauncher.bat) use this a reference to the JRE/JDK
- T7_JAVA_HOME — T7 GUI specific variable used only by the T7 GUI Launcher batch files (i.e., EurexTraderLauncher.bat) to reference the JRE to run the T7 GUIs with

To switch between JRE installations or to assign different JRE installations to different Java applications, these variables can be used.

1. The T7 GUI will first check if T7_JAVA_HOME points to a JRE. If it does, this JRE will be used to run the T7 GUIs.
2. If it does not, the T7 GUI will look for a JRE specified in JAVA_HOME.
3. If no JRE can be found there, or JAVA_HOME is not set, the first JRE (java.exe) which can be found in the directories of PATH will be used.

With this it is possible to run the T7 GUIs with the Deutsche Börse provided JRE, by setting T7_JAVA_HOME to that JRE, and to run other Java applications with another locally installed JRE, which is referenced by JAVA_HOME.

The T7 GUI Launcher installs a batch file setenv.bat (see 3.3.3) which is the intended place to set T7_JAVA_HOME.

2.3 Updates of Deutsche Börse's packaged JRE

The Java Runtime Environment will not update automatically when new updates of the JRE become available. Instead, Deutsche Börse will announce regular updates of the JRE via Implementation news on the public web pages of Eurex (derivatives markets) and Xetra (cash markets) under the following links:

www.eurex.com > Support > Information Channels > Implementation news

Direct link: https://www.eurex.com/ex-en/support/information-channels/implementation-news

www.xetra.com > Technology > Implementation news

Direct link: https://www.xetra.com/xetra-en/technology/implementation-news

Implementation news provide RSS feeds to allow users to easily keep up with updates either in an RSS reader, or in the web browser of their choice.

3. T7 GUI Launcher

After downloading the marketplace specific installation package from the Member Section, the T7 GUI Launcher “launcher.jar” needs to be executed on each local machine where the T7 GUI is to be run. Each selection will install the respective desktop shortcuts (T7 Admin GUI, T7 Trader GUI and T7 Clearer GUI).

The T7 GUI launcher can be installed manually or in an unattended mode. During manual installation, a configuration XML file can be created which can then be used for further unattended installations on other computers.

3.1 T7 GUI Launcher application as replacement for Java Web Start

The T7 GUI launcher is based on an open-source tool “getdown” and consists of a single jar file (the respective T7 GUI Launcher installation package). The installation package contains the code for downloading and validating files along with images and configuration provided by the deploying application to brand the display shown to the user while downloading and installing files. A JRE-FX version 8 (>update 1.6.1) must also be deployed on the machine that uses getdown (see chapter 2).

Using getdown the T7 GUI Launcher ensures that the latest version of a T7 GUI is always being used without the need for repeated update installations or upgrade procedures.

For more information about the getdown application, please refer to:

https://github.com/threerings/getdown/wiki

3.2 Download and installation steps of the T7 GUI Launcher

The latest version of the T7 GUI Launcher packages can be downloaded from the member section under the following paths:

Xetra / Cash markets:

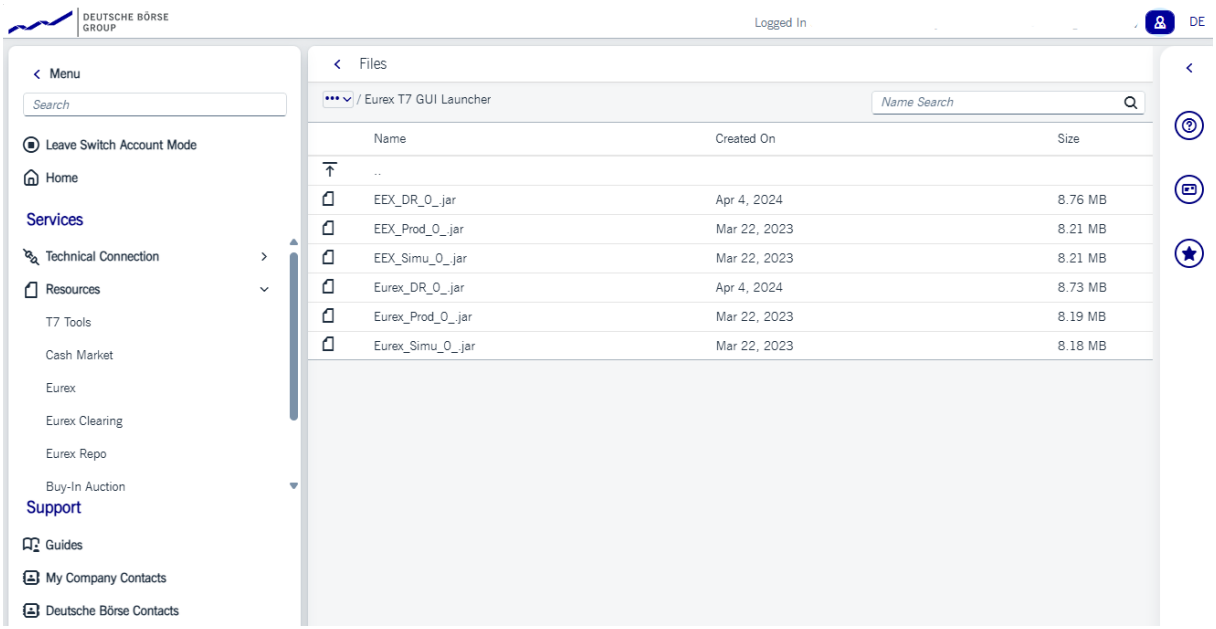
https://membersection.deutsche-boerse.com > Resources > Cash Market >

Documentation & Files > Xetra Software > Java Runtime

Eurex / Derivatives markets:

https://membersection.deutsche-boerse.com > Resources > Eurex >

Documentation & File > Eurex Software > Java Runtime



3.2.1 List of available Installation Packages

The following installation packages for cash and derivatives marketplaces are currently available:

Market Place	Environment	File Name
Eurex	**Production**	**Eurex_Prod.jar**
Eurex	**Simulation**	**Eurex_Simu.jar**
Eurex	**Disaster Recovery**	**Eurex_DR.jar**
EEX Energy	**Production**	**EEX_Prod.jar**
EEX Energy	**Simulation**	**EEX_Simu.jar**
EEX Energy	**Disaster Recovery**	**EEX_DR.jar**
Xetra	**Production**	**Xetra_Prod.jar**
Xetra	**Simulation**	**Xetra_Simu.jar**
Xetra	**Disaster Recovery**	**Xetra_DR.jar**
Xetra Partner Exchanges	**Production**	**Xetra_Partner_Ex_Prod.jar**
Xetra Partner Exchanges	**Simulation**	**Xetra_Partner_Ex_Simu.jar**
Xetra Partner Exchanges	**Disaster Recovery**	**Xetra_Partner_Ex_DR.jar**

Xetra Vienna + Partner Exchanges	**Production**	**Xetra_Vienna_Prod.jar**
Xetra Vienna + Partner Exchanges	**Simulation**	**Xetra_Vienna_Simu.jar**
Xetra Vienna + Partner Exchanges **Börse Frankfurt**	**Disaster Recovery** **Production**	**Xetra_Vienna_DR.jar** **Boerse_Frankfurt_Prod.jar**
Börse Frankfurt	**Simulation**	**Boerse_Frankfurt_Simu.jar**
Börse Frankfurt	**Disaster Recovery**	**Boerse_Frankfurt_DR.jar**

The packages for “Xetra Partner Exchanges” contain the GUIs for

- Bulgarian Stock Exchange
- Malta Stock Exchange

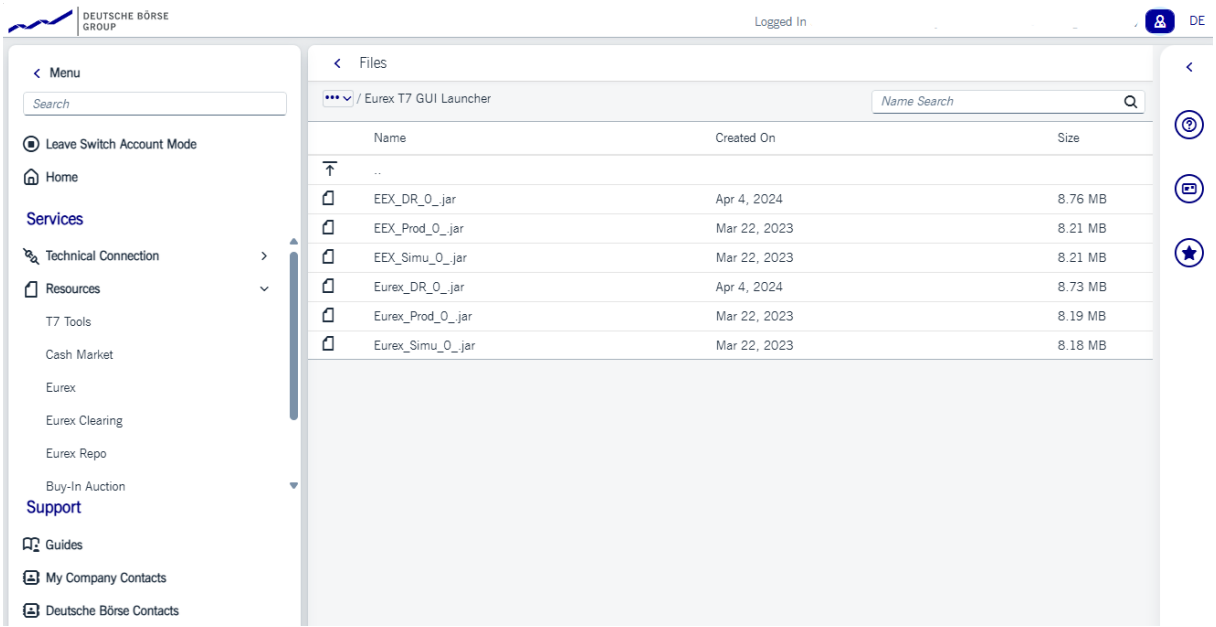
The packages for “Xetra Vienna” contain the GUIs for

- Vienna Stock Exchange
- Budapest Stock Exchange
- Ljubljana Stock Exchange
- Prague Stock Exchange
- Zagreb Stock Exchange

3.2.2 Package selection

Each T7 GUI Launcher package contains all T7 GUIs (Trader-, Admin-, and Controller GUI) for a given environment and Market Place.

Each T7 GUI Launcher package contains options to install the GUIs for Leased Line configuration or for Internet Access – or a combination of both.



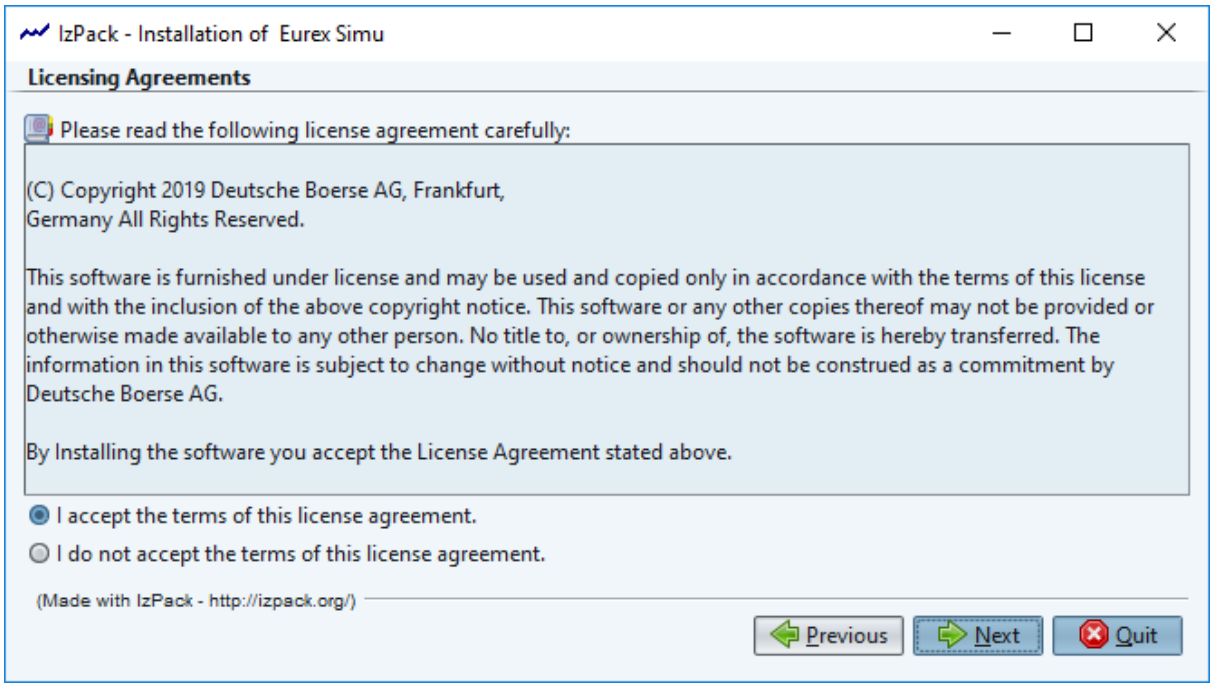
For example: download the T7 GUI Launcher package “Eurex Simulation” (Eurex_Simu.jar) to install Eurex Trader-, Eurex Admin- and Eurex Controller GUIs for T7 Simulation for your connection type.

3.2.3 Installation procedure

Execute downloaded T7 GUI Launcher .jar file on each local machine where the T7 GUI should run by either one of these two options

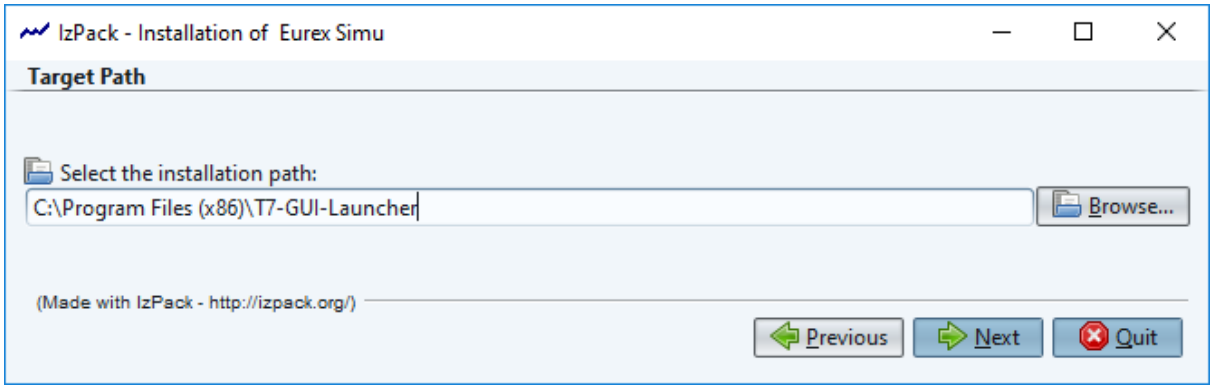
- double clicking on the .jar file
- using a java command `java –jar Eurex_Simu.jar`

After starting the installer, the license agreement needs to be accepted to continue.



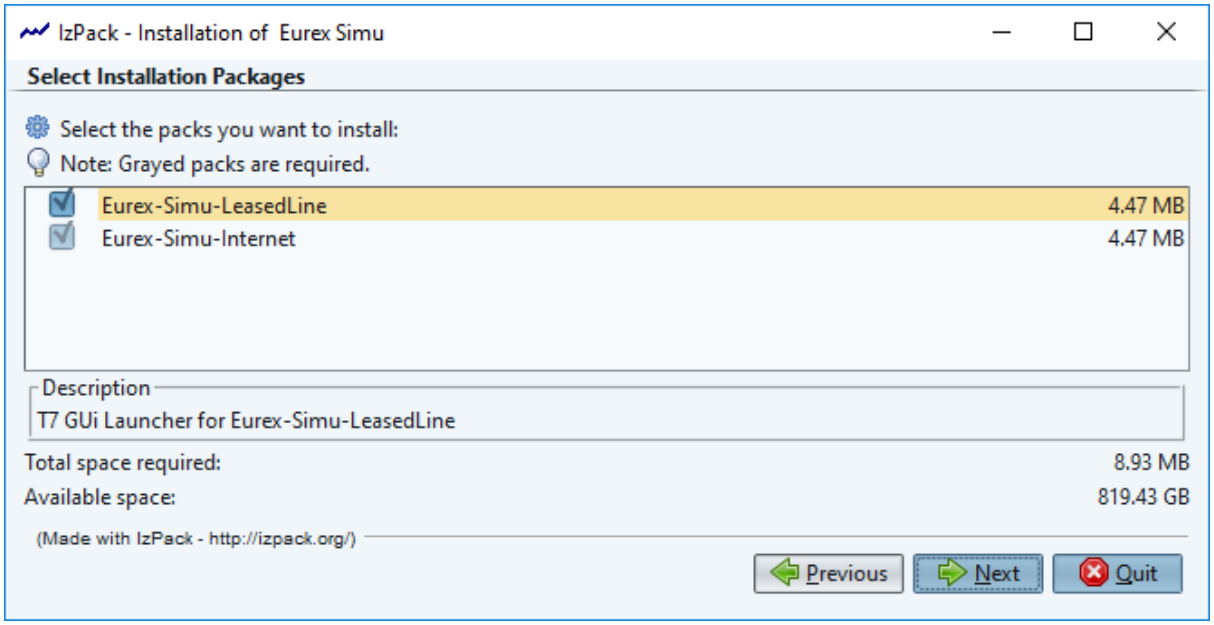
On the next screen, select the desired target path for the installation.

- The target path points to the directory where the software will be installed.



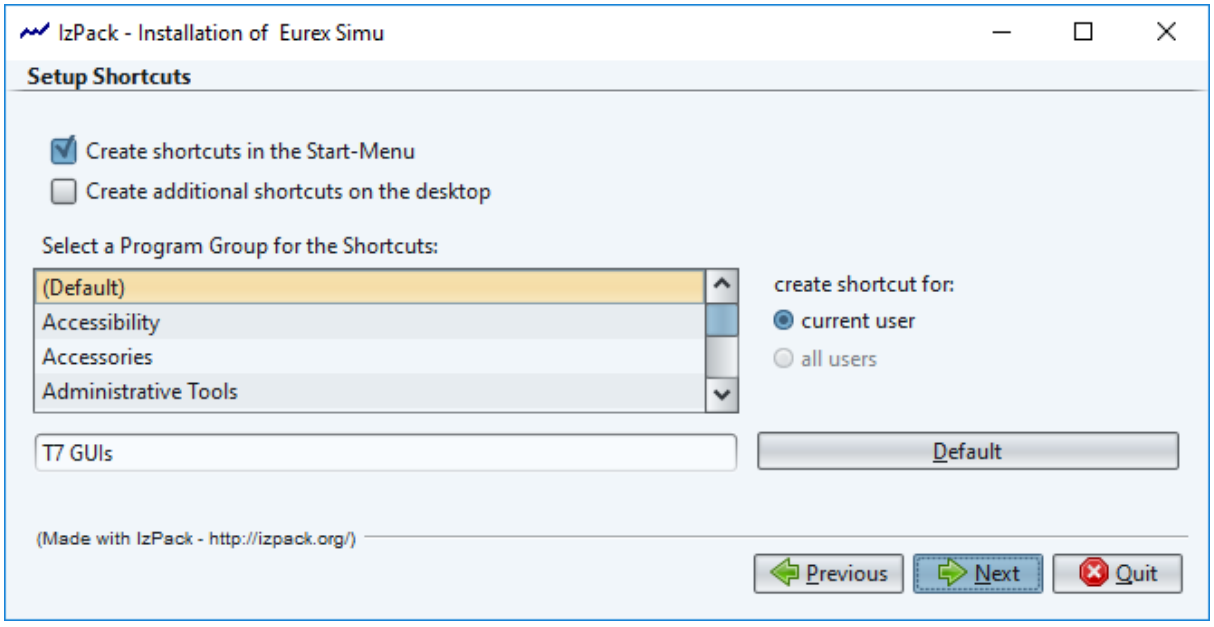
On the next screen, select the installation package for the desired connectivity option. The main choice is between connecting the T7 GUIs over the Internet (communication will be encrypted by certificates), or via leased line(s).

See chapter 5.4 for network details.



Clicking on “Next” will run the actual installation and copy the files to the designated target directory.

On the next screen, the location and the name of the Program Group for the T7 GUI shortcuts in the Windows Start-Menu can be selected as well as the option to display the Shortcuts to all users using the computer, or only to the one running the installation.

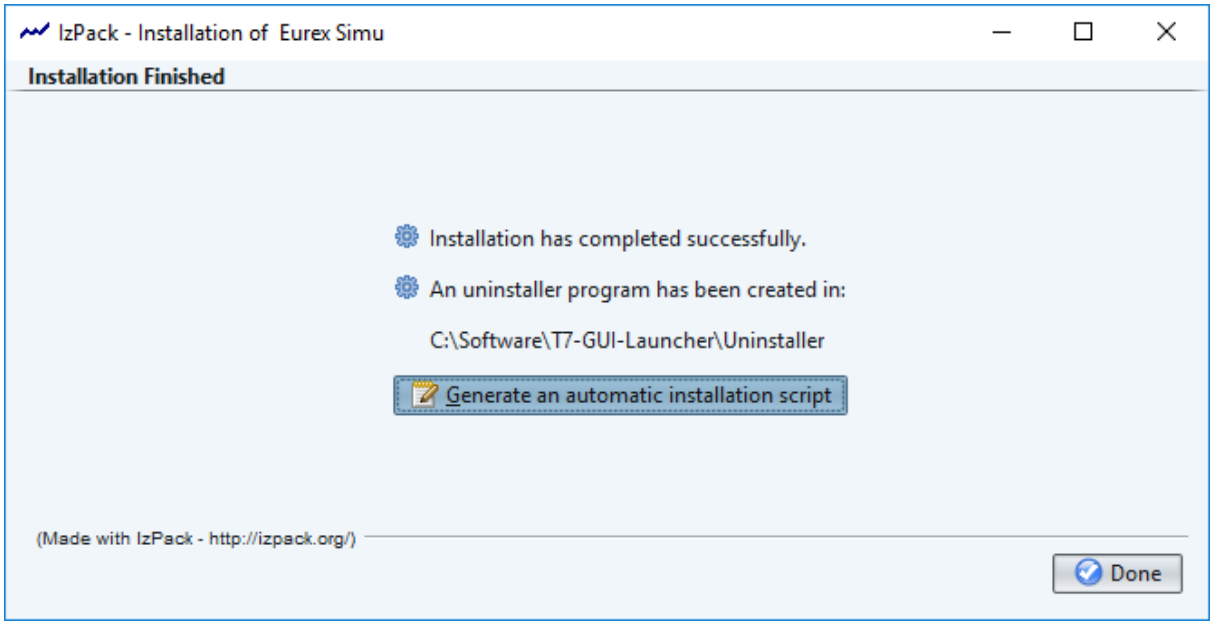


Finalize installation routine by clicking on “Next”.

3.2.4 Create xml file for unattended installation

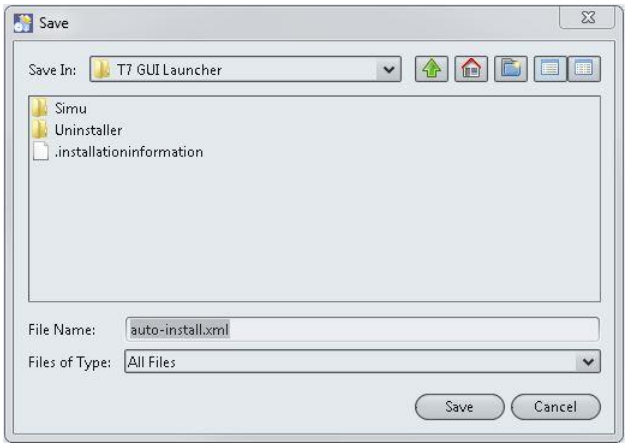
In the final installation window (see picture below), the installer offers an option to generate an automatic installation script to be able to install on several further computers in an unattended mode.

The unattended installation will take all choices made during the initial manual installation from this XML file and apply them to the new installation.



Click on “Generate an automatic installation script”.

Select file name and location of the XML file to be created.



3.2.5 Performing unattended installations

During installation in unattended mode, the installation program reads the configuration settings from an XML file created in a previous manual installation (see previous step). The installation program does not display any configuration options during the installation process.

Follow these steps to start the unattended installation:

- Create the XML file (see 3.2.4) mentioned above.
- Place the XML file next to the T7 GUI Installer .jar

- Launch the installation by entering the following command:
  - `java –jar .\Eurex_Simu.jar .\auto-install.xml`
- An Installer window is displayed, indicating that the files are being extracted.
- Once the installation completes, the setup will be identical to the one described in the referenced XML file, including shortcut location and binary/application directory.

3.3 Local files – T7 GUI Launcher

Local files can be divided into two general and quite distinct categories:

- Files belonging to the T7 GUI Launcher. These files control the mechanism for updating and starting the various T7 GUIs (i.e., log files written from the update mechanism, configuration files pointing to the Deutsche Börse software update servers, batch files setting environment variables to choose a specific Java Runtime)
- Files belonging to the T7 GUIs themselves. These files relate to aspects of the T7 GUI running (i.e., log files written by the GUI, configuration files containing GUI connection details)

This chapter describes the files required by the T7 GUI Launcher. Please see chapter 5.3 for a description of local files required by or written by the T7 GUIs themselves.

3.3.1 T7 GUI Launcher, Directory overview

The installation path for most T7 GUI Launcher packages defaults to `C:\Program Files\T7-GUI-Launcher` but can be changed during the installation. The following descriptions assumes an installation into this default installation path.

`C:\Program Files\T7-GUI-Launcher`	Default installation path
`.\DR`	Launcher for Disaster Recovery GUIs
`.\Prod`	Launcher for Production GUIs
`.\Simu`	Launcher for Simulation GUIs
`.\Uninstaller`	Files for uninstalling the launcher

Within the directory for a given environment (Prod, Simu, DR) the individual market and connection option packages will be installed. Example for Simu:

`C:\Program Files\T7-GUI-Launcher\Simu`	Simulation environment packages
`.\Eex-Simu-Internet`	Package for EEX, Internet access
`.\Eurex-Simu-Internet`	Package for Eurex, Internet access
`.\Xetra-Simu-LeasedLine`	Package for Xetra, Leased Line access
`.\BoerseFrankfurt-Simu-LeasedLine`	BoerseFrankfurt-Simu-LeasedLine
….	

These directories are created, as they are needed depending on the packages being installed. The directory "`.\Prod`" will only be created when at least one package for the production environment is installed. The directory ".`\Eex-Simu-Internet`" will only be created, when the EEX package for Simulation is installed and the connection option "Internet" has been selected for this package.

Within the directory for each specific package, several files will be created:

`C:\Program Files\T7-GUI-Launcher\Simu\Eurex-Simu-Internet`	Specific package
`.\<Market><GUI>Launcher.bat`	Batch script to start a specific GUI
`.\setenv.bat`	Batch script to set a specific JRE
`.\proxy.txt`	Proxy details if not detected automatically
`.\launcher.log`	Logfile of the launcher
`.\getdown.txt`	
`.\digest.txt`	Internal config files
`.\digest2.txt`	
`.\gui-launcher.jar`	Actual GUI launcher application
`.\images`	directory with image resources (expect 300- 400 KB per GUI and market)

As the purpose of the GUI Launcher is to keep all these files up to date, the user running the GUI Launcher needs full read and write access to all these files.

Each of these files are described in detail in the following chapters.

Once the T7 GUI launcher has been run the first time and actual T7 GUI binaries are downloaded, these binaries will be downloaded to a directory "`.\lib`" in the environment specific directory:

`C:\Program Files\T7-GUI-Launcher\Simu\lib`	T7 GUI binaries
`.\et7guis.jar`	Multiple Java packages (.jar files) expect around 60 MB per GUI type and market.

```
.\.... .jar
```

Please note:

As the OS user, running the GUI Launcher will be used to download updated components of the GUI and the Launcher itself, this OS user needs full read and write access to the directory “T7-GUI-Launcher” in the example above.

All files described above will be read and updated (= written) over time by the T7 GUI Launcher.

3.3.2 EurexTraderLauncher.bat (Launcher.bat for each market and GUI type)

Several batch files will be used to launch the actual T7 GUIs. The desktop shortcuts created by the installer link to these batch files. For example, for Eurex the following batch files will be created:

- EurexTraderLauncher.bat
- EurexAdminLauncher.bat
- EurexControlLauncher.bat

These batch files create some prerequisites localizing the default Java Runtime Environment installed on the client computer. These files should not be edited.

Furthermore, these batch files include a customizable batch file “setenv.bat” (see next chapter), which allows to specify a dedicated JRE.

3.3.3 setenv.bat

This batch file allows a Java Runtime Environment dedicated for the T7 GUIs which differs from the default JRE to be specified:

```
SET T7_JAVA_HOME=<path to JRE>
```

Edit setenv.bat to add the path to the desired JRE installation.

Important: when assigning a path containing spaces do not encapsulate the path with quotation marks!

In such a case the assignment must be done by

```
SET T7_JAVA_HOME=C:\Program Files\Java_T7
```

and not by

```
SET T7_JAVA_HOME=”C:\Program Files\Java_T7”
```

3.3.4 proxy.txt

The T7 GUI Launcher automatically tries to detect a local proxy server. If the automatic detection fails, the T7 GUI Launcher will prompt for the details (IP address and port) of the local proxy server.

Once entered, the T7 GUI Launcher will store these details in the file proxy.txt.

3.3.5 launcher.log

Once the T7 GUI Launcher has been started by starting the specific launcher batch file. i.e., EurexTraderLauncher.bat, the launcher will write a log file documenting its progress. The file launcher.log can be used for debugging issues and may be requested by Customer Technical Support.

3.3.6 getdown.txt, digest.txt, digest2.txt

The files getdown.txt, digest.txt and digest2.txt contain details for the T7 GUI Launcher regarding the download of newer versions of the T7 GUIs. digest2.txt contains SHA256 hashes and supersedes digest.txt which contains MD5 hashes. digest.txt with MD5 hashes will be deprecated at some point in the future.

The servers with the GUI binaries are specified here as well as the details and checksums of the individual GUI modules.

These files should not be changed. Changing these files in any way will cause the T7 GUI Launcher mechanism to fail.

3.3.7 Automatic file validity verification

The getdown mechanism used to download and automatically update the T7 GUIs, compares many of the locally installed files with files on Deutsche Börse servers. If a newer file is found on the Deutsche Börse servers, this newer file will be downloaded to the client computer.

If the local file matches the file on Deutsche Börse's servers, it is verified for integrity. A successful comparison and verification is indicated by an empty file (zero bytes) with the same filename as the original file plus the letter "v" added at the end of the filename.

For example:

`C:\Program Files\T7-GUI-Launcher\Simu\Eurex-Simu-Internet`	Specific package
`.\EurexTraderLauncher.bat`	Batch script to start a specific GUI
`.\EurexTraderLauncher.batv`	validation indication

Another example:

`C:\Program Files\T7-GUI-Launcher\Simu\lib`	GUI Java files
`.\et7guis.jar`	actual GUI java file
`.\et7guis.jarv`	validation indication

These validation indication files can safely be ignored for daily operations of the T7 GUI Launcher.

3.3.8 Direct call of the gui-launcher.jar

In case the standard configuration of the T7 GUI Launcher causes a conflict with the specific infrastructure in each client environment, it is possible to bypass the provided mechanisms of Launcher.bat and setenv.bat files and the T7_JAVA_HOME variable entirely.

The procedures described in this chapter are only to be considered if the standard installation and usage of the provided Launcher.bat files is not possible. Solid understanding of systems of the local operating system are required.

In such a scenario it is possible to craft a call to the gui-lancher.jar directly and adapt it to most local requirements.

```
javaw -jar gui-launcher.jar <app_dir> <app_id>
```

where:

`<app_dir>` -> specifies the working directory of the launcher. The launcher expects the following files present, readable and writable (!) in the directory specified:

`.\digest.txt`

`.\digest2.txt`

`.\getdown.txt`

`.\images\*.*` (contains various graphics to display during the GUI launch. Expect 300 – 400 KB per GUI and market.)

`<app_id>` -> specifies the type of GUI to be launched. Either one of these:

- `admin`
- `clearer`
- `trader`

The launcher will write the following files and needs write access to

`.\launcher.log`

`..\lib\*.jar` (downloaded various GUI binary files. Expect about 60 MB per GUI type and market.)

Additionally, the T7 GUI Launcher needs read and write access to all files in its own directory (i.e., digest.txt, digest2.txt, getdown.txt and all Launcher.bat files, as well as gui-launcher.jar itself) to be able to perform updates.

When calling gui-launcher.jar directly, the desired Java Runtime needs to be specified (either by use of environment variables `PATH`, or by calling a given path directly).

Please note when calling gui-launcher.jar directly, as described here, neither the environment variable `JAVA_HOME`, nor `T7_JAVA_HOME` play any role any longer.

By using this direct call (instead of the provided `Launcher.bat` files) it is possible to explicitly specify

- Java runtime of choice
- Install location of the T7 GUI Launcher (gui-launcher.jar)
- Working directory of the T7 GUI Launcher, which defines
    - download location for the actual T7 GUI binaries (JAR)
    - location of launcher log and config files

Example:

```
"C:\Program Files\Java_T7\bin\javaw" -jar D:\WORKSPACE\T7-GUI-Launcher\Simu\Eurex-Simu-Internet\gui-launcher.jar D:\WORKSPACE\T7-GUI-Launcher\Simu\Eurex-Simu-Internet
```

The line above calls a Java Runtime located in `C:\Program Files\Java_T7` (expecting a `.\bin` directory there with the Java executables). For example, the provided Azul Zulu JRE could be specified if installed.

This designated Java Runtime is asked to execute the `gui-launcher.jar` which has been installed to `D:\WORKSPACE\T7-GUI-Launcher\Simu\Eurex-Simu-Internet` in this example.

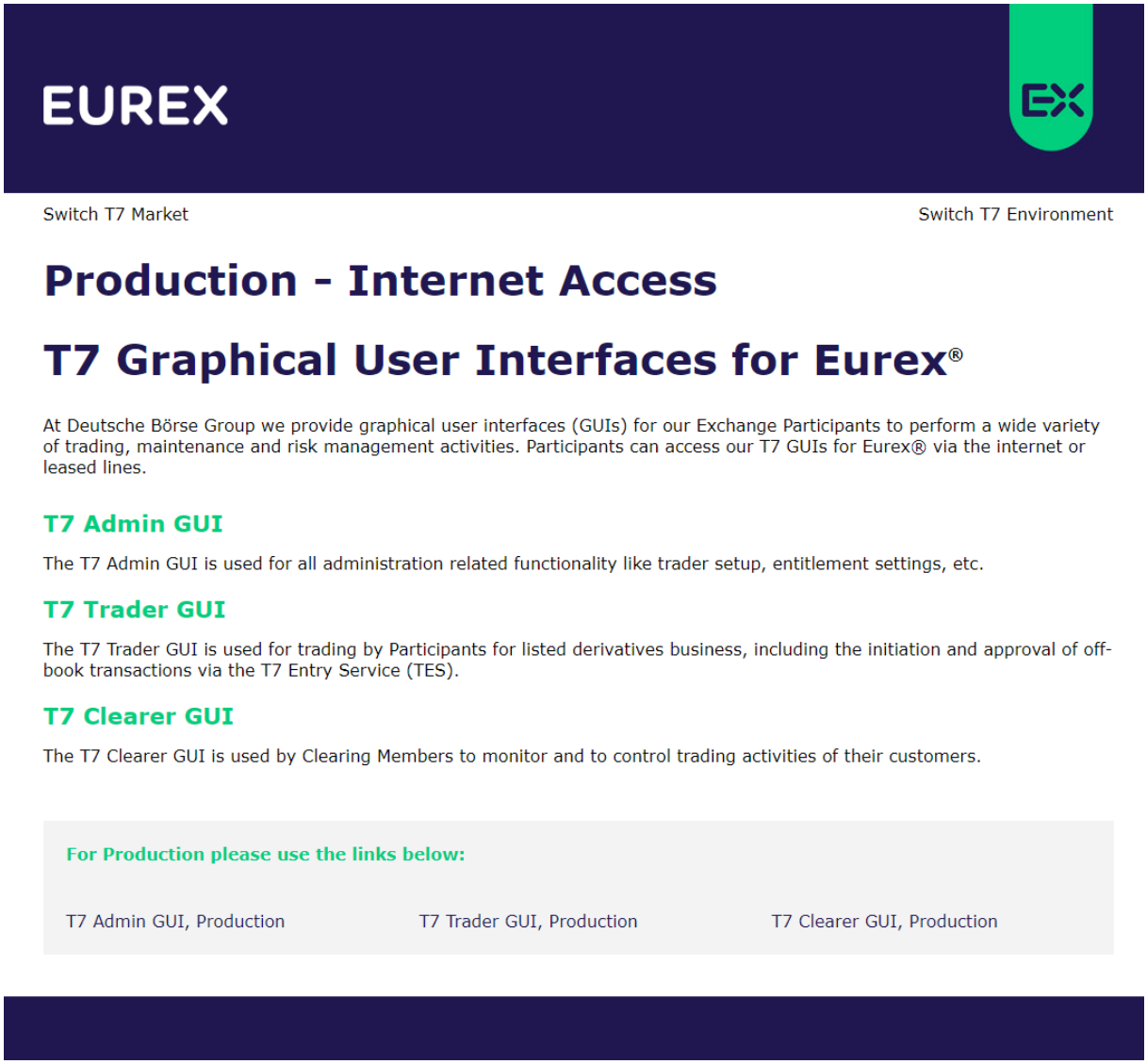
The T7 GUI Launcher is then asked to take `D:\WORKSPACE\T7-GUI-Launcher\Simu\Eurex-Simu-Internet` as his working directory (expecting to find files `digest.txt`, `digest2.txt`, `getdown.txt` and an `images` folder there).

It will download the GUI JARs to `D:\WORKSPACE\T7-GUI-Launcher\Simu\lib` (actually the path is `D:\WORKSPACE\T7-GUI-Launcher\Simu\Eurex-Simu-Internet\..\lib` - but that results in the same.)

4. T7 GUI Landing Pages

The T7 GUI Landing Pages are simple HTML web pages, which provide links to Java Web Start files (JNLP files) which allow automatic download, update, and start of all T7 GUIs.

Below is the T7 GUI Landing Page for Eurex Production, Internet Access as an example.



A locally installed Oracle Java Runtime Environment version 8 or the additionally installed Open WebStart (https://openwebstart.com minimum required version is 1.5.0 – current release is 1.12.0) is required to make use of Java Web Start and the JNLP files on these T7 GUI Landing Pages.

4.1 Landing Page URLs

The T7 GUI Landing Pages can be opened in any web browser by navigating to the URLs listed below.

4.1.1 Eurex

URL	Environment	Connectivity
https://t7gui.production.eurex.com/xeur/index.html	Production	Internet
https://t7gui.simulation.eurex.com/xeur/index.html	Simulation	Internet
https://t7gui.emergency.eurex.com/xeur/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.eurex.com/xeur/index.html	Production	Leased Line
https://t7gui.simulation.vpn.eurex.com/xeur/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.eurex.com/xeur/index.html	Disaster Recovery	Leased Line

4.1.2 Energy Exchange, EEX

URL	Environment	Connectivity
https://t7gui.production.eurex.com/xeee/index.html	Production	Internet
https://t7gui.simulation.eurex.com/xeee/index.html	Simulation	Internet
https://t7gui.emergency.eurex.com/xeee/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.eurex.com/xeee/index.html	Production	Leased Line
https://t7gui.simulation.vpn.eurex.com/xeee/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.eurex.com/xeee/index.html	Disaster Recovery	Leased Line

4.1.3 Xetra

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xetr/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xetr/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xetr/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xetr/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xetr/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xetr/index.html	Disaster Recovery	Leased Line

4.1.4 Börse Frankfurt

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xfra/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xfra/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xfra/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xfra/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xfra/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xfra/index.html	Disaster Recovery	Leased Line

4.1.5 Bulgarian Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xbul/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xbul/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xbul/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xbul/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xbul/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xbul/index.html	Disaster Recovery	Leased Line

4.1.6 Malta Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xmal/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xmal/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xmal/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xmal/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xmal/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xmal/index.html	Disaster Recovery	Leased Line

4.1.7 Vienna Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xvie/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xvie/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xvie/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xvie/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xvie/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xvie/index.html	Disaster Recovery	Leased Line

4.1.8 Budapest Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xbud/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xbud/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xbud/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xbud/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xbud/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xbud/index.html	Disaster Recovery	Leased Line

4.1.9 Ljubljana Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xlju/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xlju/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xlju/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xlju/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xlju/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xlju/index.html	Disaster Recovery	Leased Line

4.1.10 Prague Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xprg/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xprg/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xprg/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xprg/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xprg/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xprg/index.html	Disaster Recovery	Leased Line

4.1.11 Zagreb Stock Exchange

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xzag/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xzag/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xzag/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xzag/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xzag/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xzag/index.html	Disaster Recovery	Leased Line

4.1.12 Börse Düsseldorf

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xdus/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xdus /index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xdus /index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xdus /index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xdus /index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xdus/index.html	Disaster Recovery	Leased Line

4.1.13 Börse Hamburg

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xham/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xham/index.html	Simulation	Internet

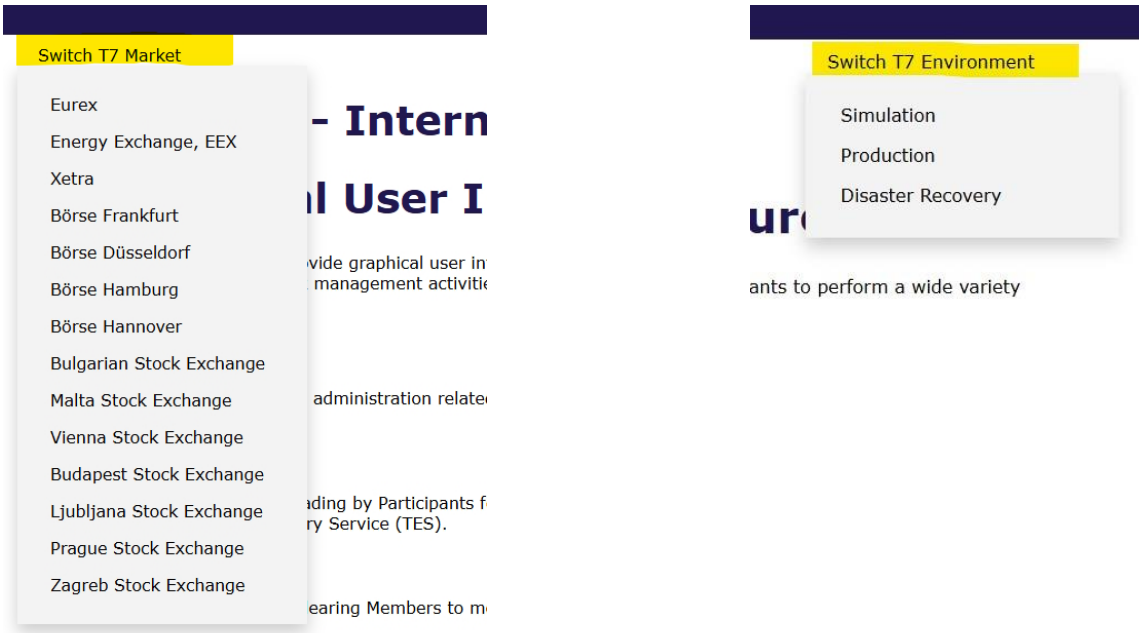
https://t7gui.emergency.xetra.com/xham/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xham/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xham/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xham/index.html	Disaster Recovery	Leased Line

4.1.14 Börse Hannover

URL	Environment	Connectivity
https://t7gui.production.xetra.com/xhan/index.html	Production	Internet
https://t7gui.simulation.xetra.com/xhan/index.html	Simulation	Internet
https://t7gui.emergency.xetra.com/xhan/index.html	Disaster Recovery	Internet
https://t7gui.production.vpn.xetra.com/xhan/index.html	Production	Leased Line
https://t7gui.simulation.vpn.xetra.com/xhan/index.html	Simulation	Leased Line
https://t7gui.emergency.vpn.xetra.com/xhan/index.html	Disaster Recovery	Leased Line

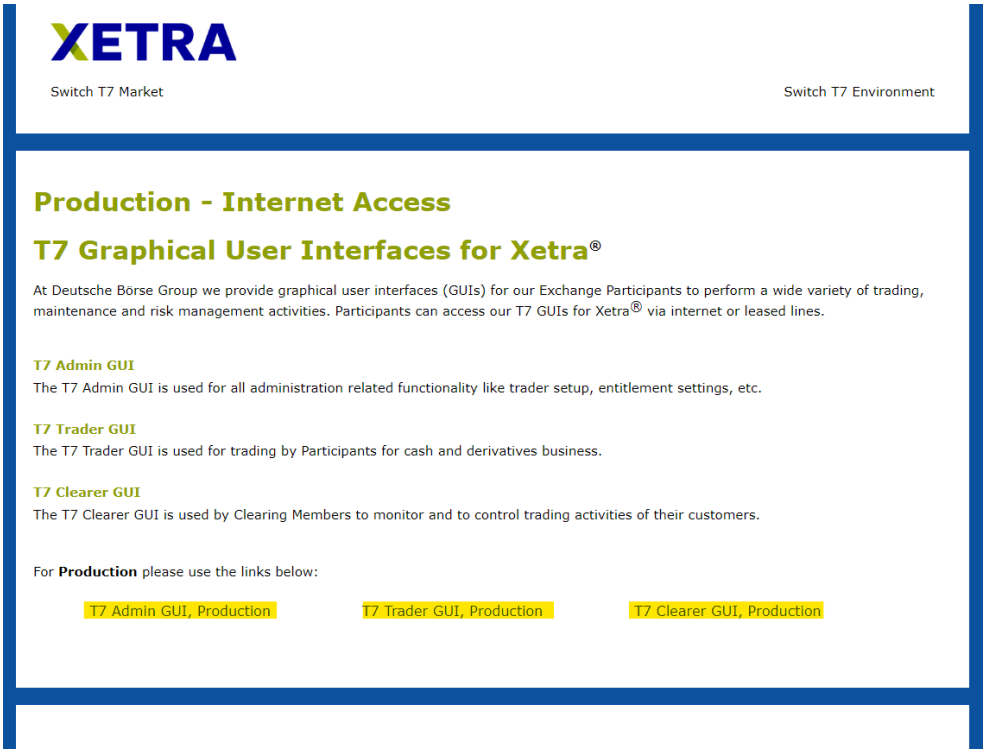
4.2 Switch Landing Page Menus

Each T7 GUI Landing Page offers two menus at the top of the page. The menu on the left-hand side allows to switch between markets, while the menu on the right-hand side allows to switch between environments (S imu, Prod, DR).



4.3 JNLP Files and MIME Type Associations / Default Apps

Each T7 GUI Landing Page offers three links to the T7 Trader-, T7 Admin-, and T7 Clearer GUI.



These links point to Java Web Start configuration files of filetype JNLP, i.e., `xetra-admin.jnlp`

To ensure that the JNLP files are automatically send to Web Start launcher on the client computer, it is recommended to set the default application to start for JNLP files to the Java Web Start executable "`javaws.exe`" (either part of Oracle's JRE, or a local installation of Open WebStart (> 1.5.0).

Setting a default application for a given filetype or setting a file type association is depending on the operating system used. For example, in Windows 11 default applications can be set by Start > Settings > Apps > Default apps.

Set the default app for JNLP files to the Java Web Start executable "`javaws.exe`" which is in the bin directory of your local Oracle Java Runtime installation (right next to "`java.exe`") or in the main directory of a local Open WebStart installation.

5. Running the T7 GUIs

5.1 T7 GUI Desktop Shortcuts

Desktop shortcuts can be installed by the T7 GUI launcher package (see 3.2.3) in the location chosen during the installation. Shortcuts can be placed in various locations, i.e., the Windows Start menu, or on the desktop. The T7 GUI Launcher installs an individual icon for each T7 GUI in each environment and marketplace. These icons can still be changed after the installation by icons of the user's choice.

5.1.1 Type of GUI

Each market consists of a set of desktop shortcuts (T7 Admin GUI, T7 Clearer GUI and T7 Trader GUI). Over all markets and environments, the main pictograms identify the function of the specific T7 GUI:

- The Admin GUI is depicted by a cogwheel.
- The Clearer GUI is depicted by two interchanging arrows.
- The Trader GUI is depicted by a trading chart.

5.1.2 Market Place / Market

A constantly growing number of stock exchanges is hosted on the T7 trading system. These are organised into "marketplaces" consisting of several markets.

Each "marketplace" has a dedicated set of T7 GUI Icons, which display a distinct logo for the market place.

Example: while the marketplace "Eurex" hosts the markets "Eurex" and "EEX", the market place "Wiener Börse" hosts five markets: Vienna Stock Exchange and Vienna's partner exchange, which are the Budapest Stock Exchange, Ljubljana Stock Exchange, Prague Stock Exchange and Zagreb Stock Exchange.

Market Place specific shortcuts (e.g., Xetra Trader)

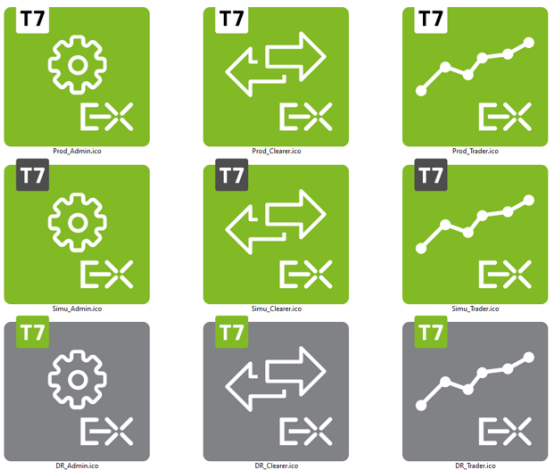
5.1.3 Type of Environment

Each set of GUI function specific icons exists for three different environments: Production, Simulation and Disaster Recovery.

Production

Simulation

Disaster Recovery



5.1.4 Color code

The colour concept makes it easier to distinguish between the different environments.

- Production: Market specific colour white T7 logo
- Simulation: Market specific colour black T7 logo
- Disaster Recovery: Grey logo background T7 logo in the market specific colour

Users of the T7 GUIs can replace the shortcut icons with icons of their own choice.

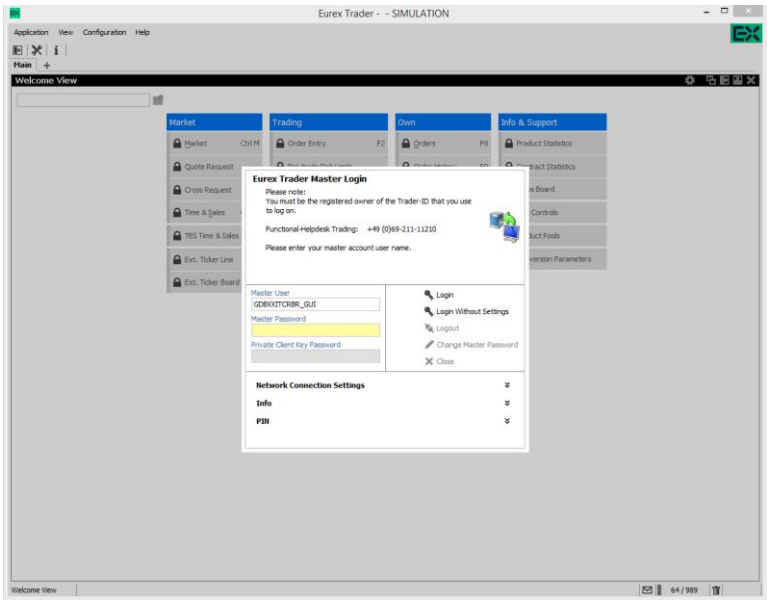
5.2 Initial setup of the T7 GUI

Clicking on one of the T7 GUI desktop shortcuts (see 5.1) will initiate the T7 GUI Launcher mechanism, using the getdown application, to download the T7 GUI in form of a .jar file from the T7 GUI Launcher server. The T7 GUI Launcher will verify if the current version of the GUI is already present in the local cache of the participant's client computer.

If the latest version has already been downloaded during a previous launch, the cached version will be used, and no further download will be necessary. If a newer version of the GUI is available on the T7 GUI Launcher server, it will be downloaded automatically and stored in the local T7 GUI Launcher cache to be used in the future.

Similar steps happen when clicking on a T7 GUI link on one of the T7 GUI Landing Pages. The JNLP file behind the link is downloaded and handed over to the local Java Web Start executable. Java Web Start will compare the latest T7 GUI binary available for download against the local Java application cache. Based on that comparison an updated binary will be downloaded, or a previously cached version will be launched.

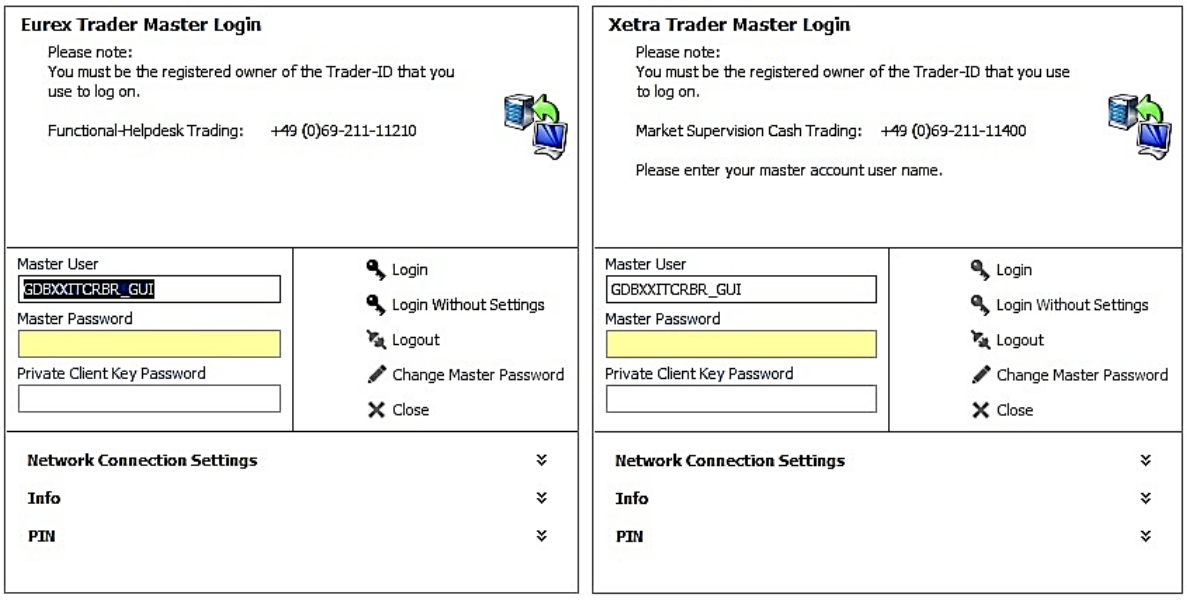
After the download has been completed, the T7 GUI Login Windows appears.



For further information about the Network Connection Settings, please refer to chapter 5.4.

5.2.1 Verify local settings

Local settings can easily be verified within the GUI itself. Open a Login view and click on the “Info” bar at the bottom of the window:



The window will expand and display a list of the settings currently used by the GUI store and read files in the client computer’s file system. The information displayed varies depending on the state of your login (after a successful login more information is displayed, e.g., Business Unit and T7 Access Point)

5.3 Local files – T7 GUI

All T7 GUIs store setup information and log files on the local client computer. The log files for the different T7 GUIs have distinguishable filenames like "`Eurex Trader.log`", "`Xetra Trader Vienna.log`", "`Xetra Admin.log`".

The GUI setup information has similarly distinguishable filenames: "`eurex-trader.properties`", or "`xetra-admin.properties`".

The default location is in the operating system user's home directory in a sub folder "gmc" (working directory)

```
C:\users\<user>\gmc
```

This folder contains sub folders for production, simulation and DR. Each of the before mentioned directories includes another folder "`etc`" for the GUI configuration (settings directory) and a folder "`var\log`" for the GUI log files (log directory).

All directory paths stated above can easily be changed using operating system environment variables.

Important: Avoid using a network directory here, since any kind of network directory will impact the application performance significantly!

Directory	Environment Variable	Default
Working directory	GMC_WORKING_DIR	`~\gmc\<environment>`
Settings directory	GMC_SETTINGS_DIR	`~\<GMC_WORKING_DIR>\<environment>\etc`
Log directory	GMC_LOG_DIR	`~\<GMC_WORKING_DIR>\<environment>\log`

Example, MS Windows:

```
SET GMC_WORKING_DIR=N:\home\gmc\

ECHO %GMC_WORKING_DIR%
```

Please see chapter 3.3 for the local files created by the T7 GUI Launcher and the location of the actual T7 GUI binaries.

5.4 Network

The connection to the T7 trading system can be made through the Internet, with or without a local proxy server (with or without authentication) or over a leased line (dedicated network connection to the Deutsche Börse Group back-end network).

5.4.1 Bandwidth requirements

Per concurrent T7 Trader GUI bandwidth consumption approximately 330 Kbit/s must be expected. Bandwidth usage is mainly driven by market data updates and depends on the selected instrument profile. As the T7 Admin GUI and the T7 Clearer GUI do not receive any market data the bandwidth requirement of the T7 Admin-, or Clearer GUI is considerably lower, with the T7 Clearer GUI bandwidth depending on the number of trades reported.

Currently offered bandwidth options for GUI channels on leased lines:

1 Mbit	~	estimated for 3 T7 Trader GUIs
3 Mbit	~	estimated for 10 T7 Trader GUIs
5 Mbit	~	estimated for 15 T7 Trader GUIs (Eurex only)
10 Mbit	~	estimated for 30 T7 Trader GUIs
40 Mbit	~	estimated for 120 T7 Trader GUIs

Please note during startup, the T7 GUI will load a set of reference data. This may consume higher bandwidths, if available, for a brief time.

5.4.2 Server IP addresses and FQDNs

The T7 GUI Launcher, T7 GUI Landing Pages and the T7 GUIs always specify network resources with their fully qualified domain names. All fully qualified domain names are resolvable via public DNS servers.

Client computers running the T7 GUIs via T7 GUI Launcher or T7 GUI Landing Page need to be able to reach public DNS servers or must be able to resolve the following FQDNs by other, local means (i.e., hosts files).

T7 GUI Launcher & Landing Page Servers

FQDN	IP	Markets	Environment	Connectivity
t7gui.production.eurex.com	193.29.90.182	Derivatives markets	Production	Internet
t7gui.simulation.eurex.com	193.29.90.183	Derivatives markets	Simulation	Internet
t7gui.emergency.eurex.com	193.29.90.181	Derivatives markets	Disaster Rec	Internet
t7gui.production.vpn.eurex.com	193.29.93.169	Derivatives markets	Production	Leased Line
t7gui.simulation.vpn.eurex.com	193.29.93.170	Derivatives markets	Simulation	Leased Line
t7gui.emergency.vpn.eurex.com	193.29.93.168	Derivatives markets	Disaster Rec	Leased Line
t7gui.production.xetra.com	193.29.90.179	Cash markets	Production	Internet
t7gui.simulation.xetra.com	193.29.90.180	Cash markets	Simulation	Internet
t7gui.emergency.xetra.com	193.29.90.178	Cash markets	Disaster Rec	Internet

t7gui.production.vpn.xetra.com	193.29.93.163	Cash markets	Production	Leased Line
t7gui.simulation.vpn.xetra.com	193.29.93.167	Cash markets	Simulation	Leased Line
t7gui.emergency.vpn.xetra.com	193.29.93.162	Cash markets	Disaster Rec	Leased Line

T7 GUI "Crypto Proxies"

FQDN	IP	Markets	Environment	Connectivity
guiproxyp1.eurexchange.com	193.29.90.203	Eurex / EEX	Production	Internet
guiproxyp2.eurexchange.com	193.29.90.204	Eurex / EEX	Production	Internet
guiproxyp1.vpn.eurexchange.com	193.29.91.225	Eurex / EEX	Production	Leased Line A
guiproxyp2.vpn.eurexchange.com	193.29.93.225	Eurex / EEX	Production	Leased Line B
guiproxys1.eurexchange.com	193.29.90.235	Eurex / EEX	Simulation	Internet
guiproxys2.eurexchange.com	193.29.90.236	Eurex / EEX	Simulation	Internet
guiproxys1.vpn.eurexchange.com	193.29.89.225	Eurex / EEX	Simulation	Leased Line A
guiproxys2.vpn.eurexchange.com	193.29.95.225	Eurex / EEX	Simulation	Leased Line B
guiproxyp1.xetra.com	193.29.90.217	Cash markets	Production	Internet
guiproxyp2.xetra.com	193.29.90.218	Cash markets	Production	Internet
guiproxyp1.vpn.xetra.com	185.102.253.161	Cash markets	Production	Leased Line A
guiproxyp2.vpn.xetra.com	185.102.253.177	Cash markets	Production	Leased Line B
guiproxys1.xetra.com	193.29.90.233	Cash markets	Simulation	Internet
guiproxys2.xetra.com	193.29.90.234	Cash markets	Simulation	Internet
guiproxys1.vpn.xetra.com	193.29.94.225	Cash markets	Simulation	Leased Line A
guiproxys2.vpn.xetra.com	193.29.94.233	Cash markets	Simulation	Leased Line B
guiproxyp1.boerse-frankfurt.de	193.29.90.215	Boerse Frankfurt	Production	Internet
guiproxyp2.boerse-frankfurt.de	193.29.90.216	Boerse Frankfurt	Production	Internet
guiproxyp1.vpn.boerse-frankfurt.de	185.102.253.162	Boerse Frankfurt	Production	Leased Line A
guiproxyp2.vpn.boerse-frankfurt.de	185.102.253.178	Boerse Frankfurt	Production	Leased Line B
guiproxys1.boerse-frankfurt.de	193.29.90.254	Boerse Frankfurt	Simulation	Internet
guiproxys2.boerse-frankfurt.de	193.29.90.253	Boerse Frankfurt	Simulation	Internet
guiproxys1.vpn.boerse-frankfurt.de	193.29.94.227	Boerse Frankfurt	Simulation	Leased Line A
guiproxys2.vpn.boerse-frankfurt.de	193.29.94.235	Boerse Frankfurt	Simulation	Leased Line B

5.4.3 Network details, T7 GUI download and update

Transferring the T7 GUI in form of a JAR file via T7 GUI Launcher or T7 GUI Landing Page (Java Web Start) mechanism is based on TCP/IP on port 443, SSL only. To serve that purpose, two sets of servers are used: One for Internet and one for leased line connections.

Connection Option	URL of getdown Servers	Ports	Protocol
Eurex T7, & EEX T7			
Internet	t7gui.production.eurex.com	443	TCP/IP
Internet	t7gui.simulation.eurex.com	443	TCP/IP
Internet	t7gui.emergency.eurex.com	443	TCP/IP
Leased line	t7gui.production.vpn.eurex.com	443	TCP/IP
Leased line	t7gui.simulation.vpn.eurex.com	443	TCP/IP
Leased line	t7gui.emergency.vpn.eurex.com	443	TCP/IP
Xetra T7 & Xetra Vienna T7 (including Partner Exchanges)			
Internet	t7gui.production.xetra.com	443	TCP/IP
Internet	t7gui.simulation.xetra.com	443	TCP/IP
Internet	t7gui.emergency.xetra.com	443	TCP/IP
Leased Line	t7gui.production.vpn.xetra.com	443	TCP/IP
Leased Line	t7gui.simulation.vpn.xetra.com	443	TCP/IP
Leased Line	t7gui.emergency.vpn.xetra.com	443	TCP/IP

As soon as the download of the JAR file has been completed or the most recent version has been found on the local hard drive, it will be started by the local Java Runtime Environment (JRE).

Once the T7 GUI application has been started within the local Java Virtual Machine the network communication between the client computer and the receiving proxy servers within the T7 trading architecture will be done on the ports listed below.

Eurex T7 & EEX T7

Environment	Connection Option	Host (FQDN)	Ports: Trader GUI	Ports: Admin GUI	Ports: Clearer GUI	Protocol
Production	Internet	guiproxyp1.eurexchange.com guiproxyp2.eurexchange.com	80	80	80	TCP/IP
	Leased line A Leased line B	guiproxyp1.vpn.eurexchange.com guiproxyp2.vpn.eurexchange.com	8089	80	8089	TCP/IP

Environment	Connection Option	Host (FQDN)	Ports: Trader GUI	Ports: Admin GUI	Ports: Clearer GUI	Protocol
Simulation	Internet	guiproxys1.eurexchange.com guiproxys2.eurexchange.com	80	80	80	TCP/IP
	Leased line A Leased line B	guiproxys1.vpn.eurexchange.com guiproxys2.vpn.eurexchange.com	8089	80	8089	TCP/IP

Xetra T7 & Xetra Vienna T7 (including Partner Exchanges)

Environment	Connection Option	IP Addresses	Ports: Trader GUI	Ports: Admin GUI	Ports: Clearer GUI	Protocol
Production	Internet	guiproxyp1.xetra.com guiproxyp2.xetra.com	80	80	80	TCP/IP
	Leased line A Leased line B	guiproxyp1.vpn.xetra.com guiproxyp2.vpn.xetra.com	8089	80	8089	TCP/IP
Simulation	Internet	guiproxys1.xetra.com guiproxys2.xetra.com	80	80	80	TCP/IP
	Leased line A Leased line B	guiproxys1.vpn.xetra.com guiproxys2.vpn.xetra.com	8089	80	8089	TCP/IP

Börse Frankfurt

Environment	Connection Option	IP Addresses	Ports: Trader GUI	Ports: Admin GUI	Ports: Clearer GUI	Protocol
Production	Internet	guiproxyp1.boerse-frankfurt.de guiproxyp2.boerse-frankfurt.de	82	82	82	TCP/IP
	Leased line A Leased line B	guiproxyp1.vpn.boerse-frankfurt.de guiproxyp2.vpn.boerse-frankfurt.de	8091	82	8091	TCP/IP
Simulation	Internet	guiproxys1.boerse-frankfurt.de guiproxys2.boerse-frankfurt.de	82	82	82	TCP/IP
	Leased line A Leased line B	guiproxys1.vpn.boerse-frankfurt.de guiproxys2.vpn.boerse-frankfurt.de	8091	82	8091	TCP/IP

If a firewall is in place, the ports listed above need to be configured. All connections will be opened only from the client side to the Deutsche Börse Group servers. Please note that traffic over the Internet will be encrypted. Although port 80/82 or 8089/8091 is being used, firewalls will not be able to read or inspect the content (payload) of the TCP/IP packets sent on this port.

5.4.4 Leased line network aspects

For leased lines connections the outbound TCP/IP address for T7 GUI connections is expected to be within the assigned member LAN.

The technical implementation can be performed by placing a proxy server in the member LAN, taking on one side the connections to the trading desks and on the other side residing in the assigned member LAN.

Alternatively, network address translation (NAT) protocols (static or dynamic) can be implemented in the trading participant's network to shield the in-house network addresses and translate them to addresses in the assigned member LAN.

Routes to the leased line networks listed in the table in the previous chapter need to be present on the client computer. Please note that these should point to the leased lines and not to the Internet.

If present, local Internet proxy servers should implement an exception to access the leased line networks. This can be configured in .pac files of most proxy servers by commanding direct connections to the specified network/host:

```
if ( isInNet( host, "t7gui.production.vpn.eurex.com", "255.255.255.255" ))
{return "DIRECT";}
```

For leased line connections, SSH authentication is not required or possible.

5.4.5 Internet connections aspects, public key pair authentication

GUI connections established over the Internet require an additional security level for encryption and authentication, which is not present for leased line connections.

An SSH-2 key pair must be created, and the public key must be uploaded to Deutsche Börse Group via the web portal in the DBAG Member Section https://membersection.deutsche-boerse.com/ . Please see chapter 6 for detailed instructions on how to create an SSH key pair and how to upload the public key.

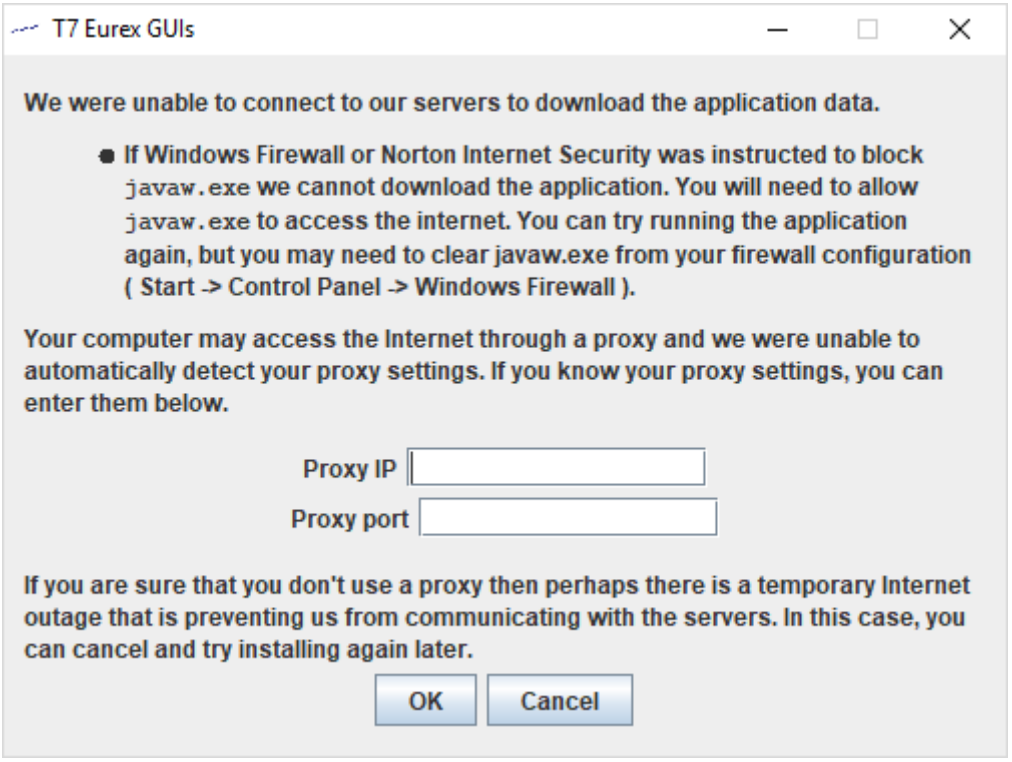
The SSH key pair is used just for authentication. The T7 GUI solutions do not establish an SSH tunnel but encrypt the payload of the network packets on application level.

5.4.6 Local proxy servers

Customers may deploy their own proxy servers for connection via Internet or via leased lines.

T7 GUI Launcher

Clicking on any of the presented T7 GUI shortcuts will trigger the T7 GUI Launcher process. The T7 GUI Launcher will determine local proxy settings automatically. If for any reason the proxy cannot be determined, a dialogue box will appear where you can create the entries manually.

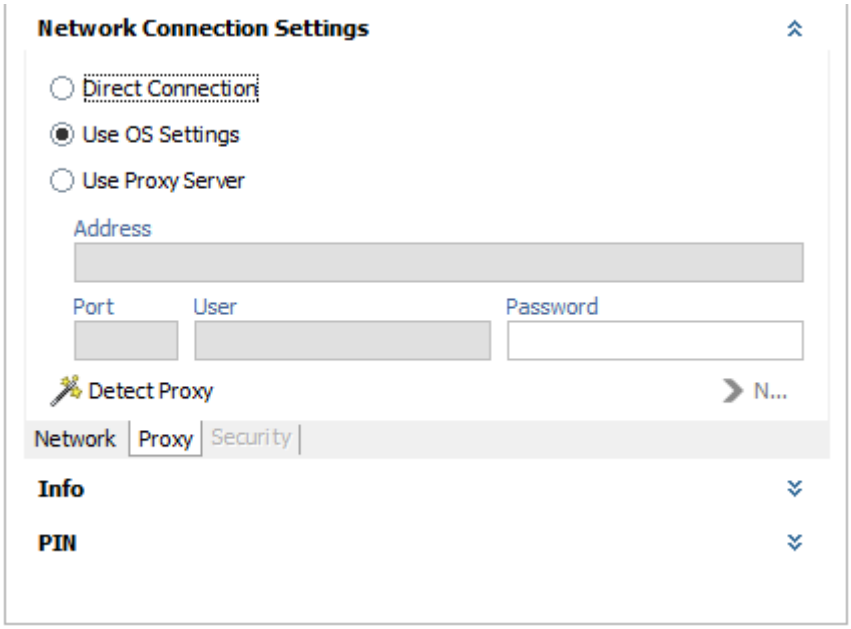


The information entered here will be stored in the file “proxy.txt” in the T7 GUI Launcher directory:

```
host = 1.2.3.4
port = 8080
```

T7 GUIs

If present, specify a local proxy server in the T7 GUI on the 2nd tab of the Network Connection Settings dialog (see chapters 7.2 and 7.5). If your proxy server requires authentication, please specify username and password for your proxy authentication too.



Please note detailed proxy settings can be specified within this dialog, by activating “Use Proxy Server”. Alternatively, proxy settings can be copied automatically from the operating system (Control Panel → Network and Internet → Internet Options → Connections → LAN Settings) by activating “Use OS Settings”. When no local proxy is used at all for the T7 GUI connection, “Direct Connection” must be selected.

The following general proxy server requirements are needed for running the T7 Admin-, T7 Trader-, or T7 Clearer GUI via proxy:

- proxy must accept „HTTP 1.1“
- proxy must understand header „Proxy-Connection“ and „Connect“ with value „keep-alive“
- proxy must understand header „Transfer-Encoding“ with value „chunked“

Known proxy server versions and limitations

- commercial proxy **BlueCoat**
  - Version SGOS 4.3, 5.4, 5.5 and 6.x known to be good.
  - Version SGOS 4.2 known to be not working (End of live was 2010 according to BlueCoat)
- Open-Source proxy **Squid**
  - Version 3.2.x or newer known to be good (6.10 being most recent as of writing of this document)
  - Incoming port must be configured for http in squid.conf

To guarantee maximum performance and most problem-free operation of the T7 GUIs, the following general recommendations can be made:

- T7 GUIs encrypt all traffic from and to the exchange. Due to this, the traffic cannot be inspected by firewalls. Firewalls sensitive to this need to be configured to allow encrypted

traffic from and to the T7 IP addresses and ports. Content scan for the T7 GUI traffic needs to be disabled.

- The protocols used by the T7 GUI can be sensitive to connection interruptions. It is recommended to configure traffic to the T7 GUI IP addresses and ports with an increased priority.
- In certain scenarios, proxy servers requiring authentication themselves can cause problems in the T7 GUI communication (http 407 error). If not absolutely required by local security policy, it is recommended to run the T7 GUIs via proxies that do not require authentication.

In general, the main method of communication of the T7 GUI, once they are downloaded and running on the client computer is the protocol “WebSocket” (see RFC 6455 and 7936 for details). WebSocket allows near real-time communication between the GUI application and the exchange servers.

WebSocket replaced the “Long Polling” (see RFC 6202 for details) communication method which was used by earlier versions of the T7 GUIs (Release 1.0 – 3.0) but can still be used by the T7 GUIs as a fall-back option.

5.5 Disaster Recovery

Dedicated T7 GUI Launcher and T7 GUI Landing Pages exist which must be used in case of a disaster recovery scenario. These are to be used in case the regular T7 trading back end becomes fully unavailable and Deutsche Börse Group must run the markets from a disaster recovery data center. See the document “T7 Disaster Recovery Concept” for further details about the disaster scenario. The document “T7 Disaster Recovery Concept” can be found on the Eurex and Xetra homepages under “System documentation > Network Access”.

6. SSH key pair generation

The following chapter applies only for customers who intend to run the T7 Trader GUI, T7 Admin GUI, or the T7 Clearer GUI via the native Internet. T7 GUI connections over leased lines do not require any SSH key pair authentication.

To generate an SSH-2 public/private key various freeware tools are available for download from the Internet, for instance:

- PuTTYgen.exe (available for MS Windows),
- ssh-keygen from http://www.openssh.org for various operating systems.

The key generation process will produce both the public and the private RSA keys in PEM format with a length of 3060 bytes.

Key pairs can be created either for an entire business unit or for individual traders. Key generation for both options is identical. The use of the keys (business unit vs. individual traders) is determined during upload into the Member Section as outlined in chapter 6.3.

To help associate keys with business unit or individual member IDs it is suggested to use corresponding filenames as indicated in the examples below.

IMPORTANT: Each key private must be protected with a passphrase. This is mandatory for the T7 simulation and for production environments.

6.1 Private and public key with OpenSSH (ssh-keygen)

After installing OpenSSH type the following command on the command line to create both, a public and a private key (in this example with a length of 3060 bytes):

```
      $ ssh-keygen -t rsa -b 3060 -m PEM -N <passphrase> -f
/home/username/.ssh/ MEMBRTRD001

Generating public/private rsa key pair.
Your identification has been saved in /home/username/.ssh/ MEMBRTRD001.
Your public key has been saved in /home/username/.ssh/ MEMBRTRD001.pub.
The key fingerprint is:
f8:e9:1a:ee:a0:d7:2b:4a:8e:fa:4d:80:43:e0:96:1a username@host.domain.de
The key's randomart image is:
+--[ RSA 3060]----+
|.                |
|o .              |
|E=               |
|+o     .         |
|+ .   . S        |
| . .   . .       |
|  . o.. o        |
| + +oo.o         |
|+.=o.o=o.        |
+-----------------+
```

The following keys will be created:

```
      $ ls -al MEMBR*

-rw------- 1 username group 1675 Jul 17 16:28 MEMBRTRD001
-rw-r--r-- 1 username group  405 Jul 17 16:28 MEMBRTRD001.pub
```

The public key can be identified by the file extension ".pub", while the private key has no file extension. Please note the different file access rules for both keys.

The private key file must be accessible from the GUI user's workstation but should never be distributed further.

Alternatively, the tool ssh-keygen can be used in an interactive session:

```
      $ ssh-keygen -t rsa -b 3060 -m PEM

Generating public/private rsa key pair.
Enter file in which to save the key (/home/username/.ssh/id_rsa):
/home/username/.ssh/MEMBRTRD002
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/username/.ssh/MEMBRTRD002.
Your public key has been saved in /home/username/.ssh/MEMBRTRD002.pub.
The key fingerprint is:
17:0f:1c:7b:67:bc:34:6f:a6:52:7c:4b:7e:d7:16:8e username@host.domain.de
The key's randomart image is:
+--[ RSA 3060]----+
|          .      |
|         . o .   |
|          = . *  |
|           = = + |
|        S . . +o=|
|         .   .==+|
|            .E.+=|
|             . .o|
|                 |
+-----------------+
```

The following keys will be created:

```
      $ ls -al MEMBR*

-rw------- 1 username group 1743 Jul 17 16:30 MEMBRTRD002
-rw-r--r-- 1 username group  405 Jul 17 16:30 MEMBRTRD002.pub
```

The public key can be identified by the file extension ".pub", while the private key has no file extension. Please note the different file access rules for both keys.

The private key file must be accessible from the GUI user's workstation but should never be distributed further.

Please note, newer version of OpenSSH (7.8 and newer) changed the default output format from PEM to an OpenSSH format. Users using OpenSSH 7.8 or newer must ensure to include the parameter "`-m PEM`" in their OpenSSH format to create keys in PEM format, which is the required format for the T7 GUIs.

Keys valid for T7 GUIs in PEM format are easily recognizable by their first line:

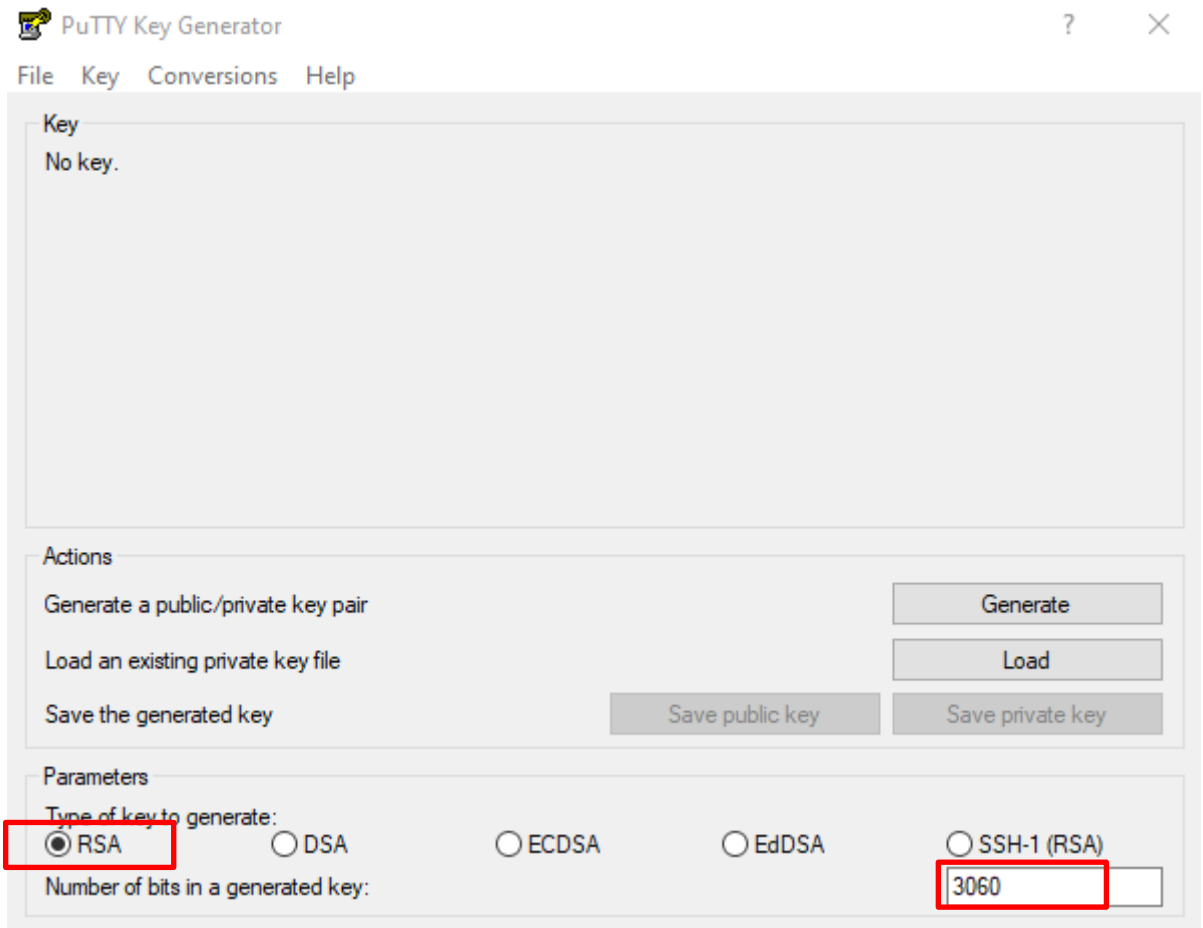
```
-----BEGIN RSA PRIVATE KEY-----
```

While keys beginning with this line are not compatible with the T7 GUIs.

```
-----BEGIN OPENSSH PRIVATE KEY-----
```

6.2 Key generation with puttygen

The following chapter describes the key generation procedure with puttygen.exe under MS Windows. After starting PuTTY Key Generator (run "puttygen.exe") there will be an almost empty PuTTY Key Generator screen visible.

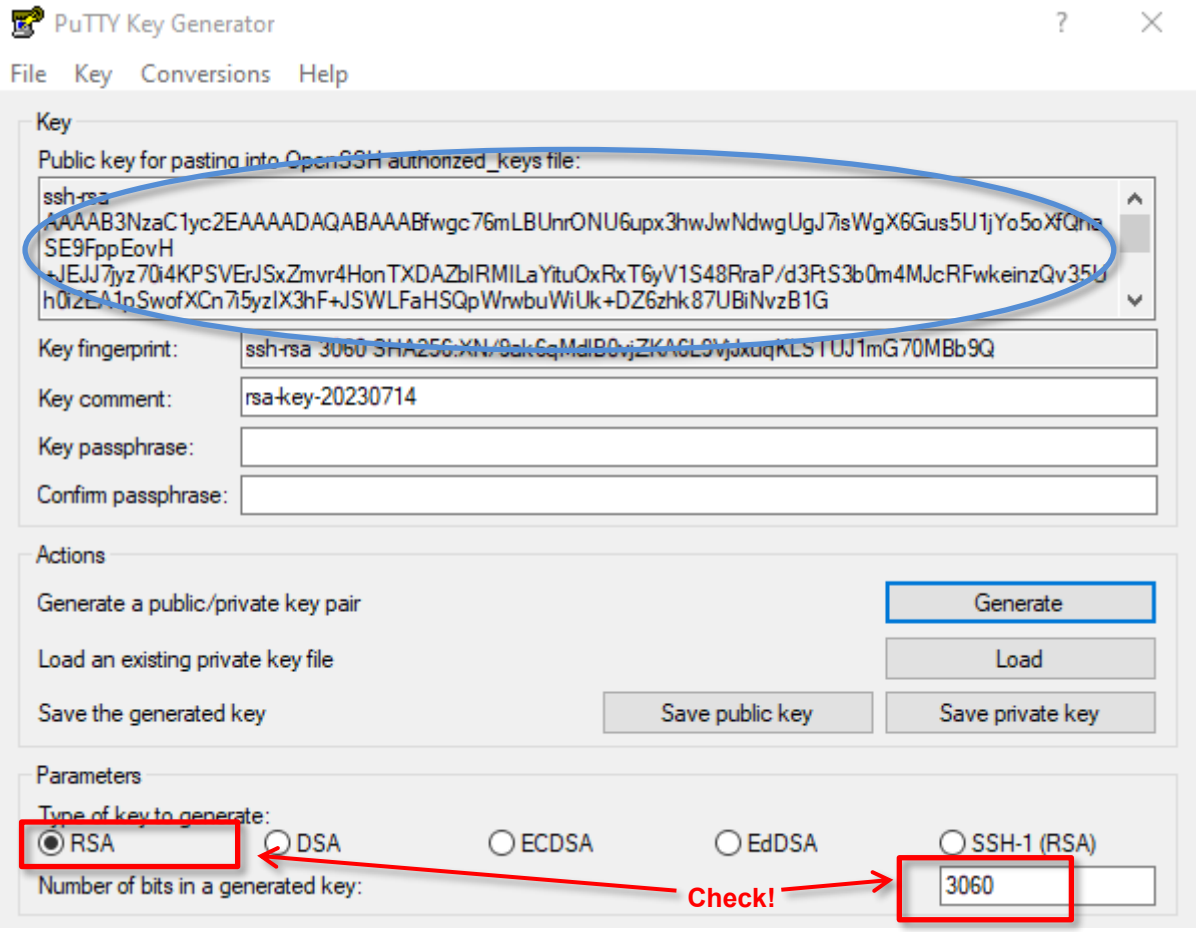


Parameters:

- Type of key to be generated: **RSA**
- Number of bits in a generated key: **3060** (up to 16384)

Once the parameters are set, click on “Generate” and move your mouse pointer for a while over the blank area. The key pair will be generated.

IMPORTANT: Each key private must be protected with a passphrase. This is mandatory for both the T7 simulation and for production environments.

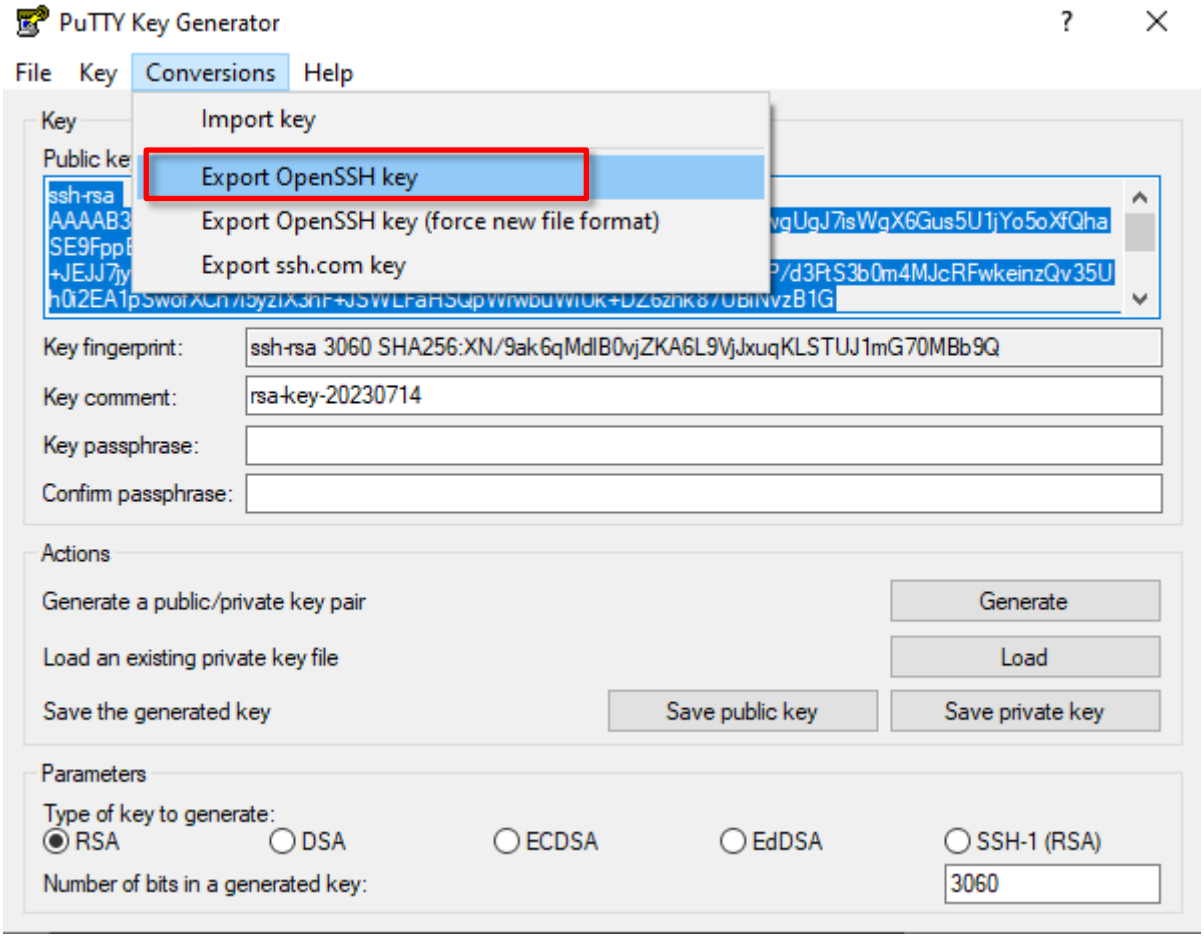


Public key: Copy the key and paste it into a text editor (e.g. Notepad), change the ending to .pub and save it on your computer.

To save the public key, select the key in the textbox with the mouse. Make sure that you have selected the full key, which may be longer than the window can display at once. This may require scrolling. Copy the selected key to the clipboard (CTRL-C). Open a text editor, i.e., “Notepad” or “Editor” and paste (CTRL-V) the key into the editor. Save the file as the public key.

The public key needs to be uploaded to the Member Section of the Eurex or Xetra website. The process is described in the next chapter.

Privat key: To save the private key, click on “Conversions” in the menu bar of PuTTYgen and select “Export OpenSSH key” as shown in the screenshot below.



Both keys are required to run any T7 GUI over the internet.

Please note: Both key files must be accessible from the T7 GUI user's workstation but should never be distributed further.

6.3 Public key – Member Section upload

The public key created as outlined above needs to be uploaded to the Member Section at https://membersection.deutsche-boerse.com/ . The user uploading public keys needs to be a registered "Technical User Administrator".

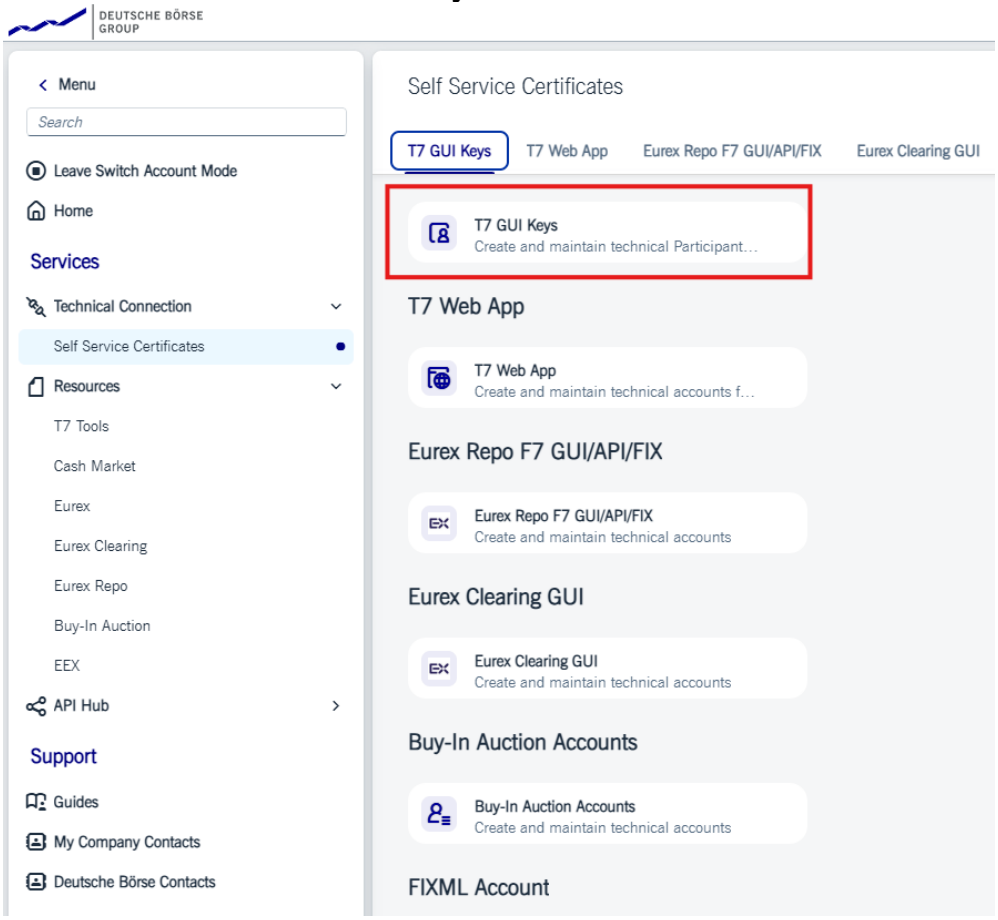
From the Member Section the key will be transferred to the proxy servers for T7 GUI usage via Internet. An uploaded key will be usable within one hour after successful upload.

Keys can be created either for the entire business unit or for individual traders. Uploaded keys are valid for one market only. Customers trading on several markets need to upload keys for each market.

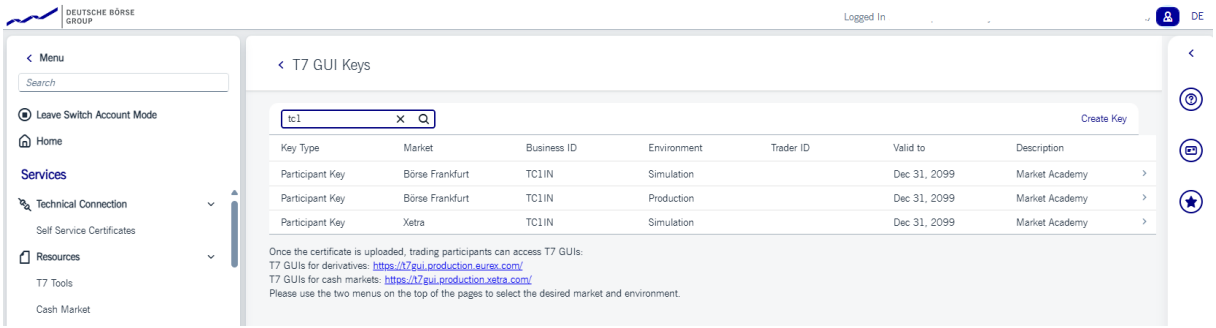
Please note: Uploading a new key for a trader or a business unit overwrites any previously uploaded key.

Follow the path below to reach the T7 GUI key upload page.

DBAG Member Section-> Technical Connection-> Self Service Certificates > T7 GUI Keys



The path above will take you to the T7 GUI Keys page:



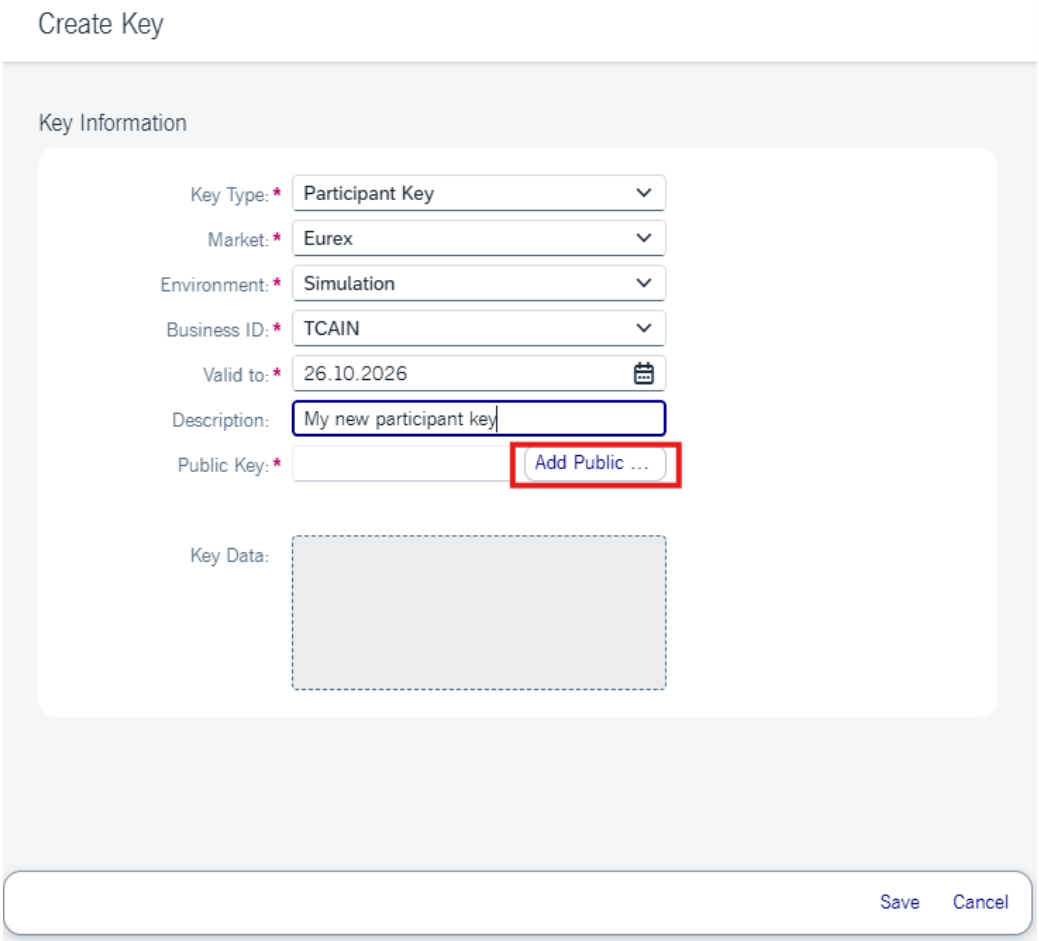
Public keys can be uploaded and registered either for a whole business unit where every trader uses the same key (described in the chapter 6.3.1 New Participant Key) or individually for every trader individually (described in the chapter 6.3.2 New Trader Key).

6.3.1 New Participant Key

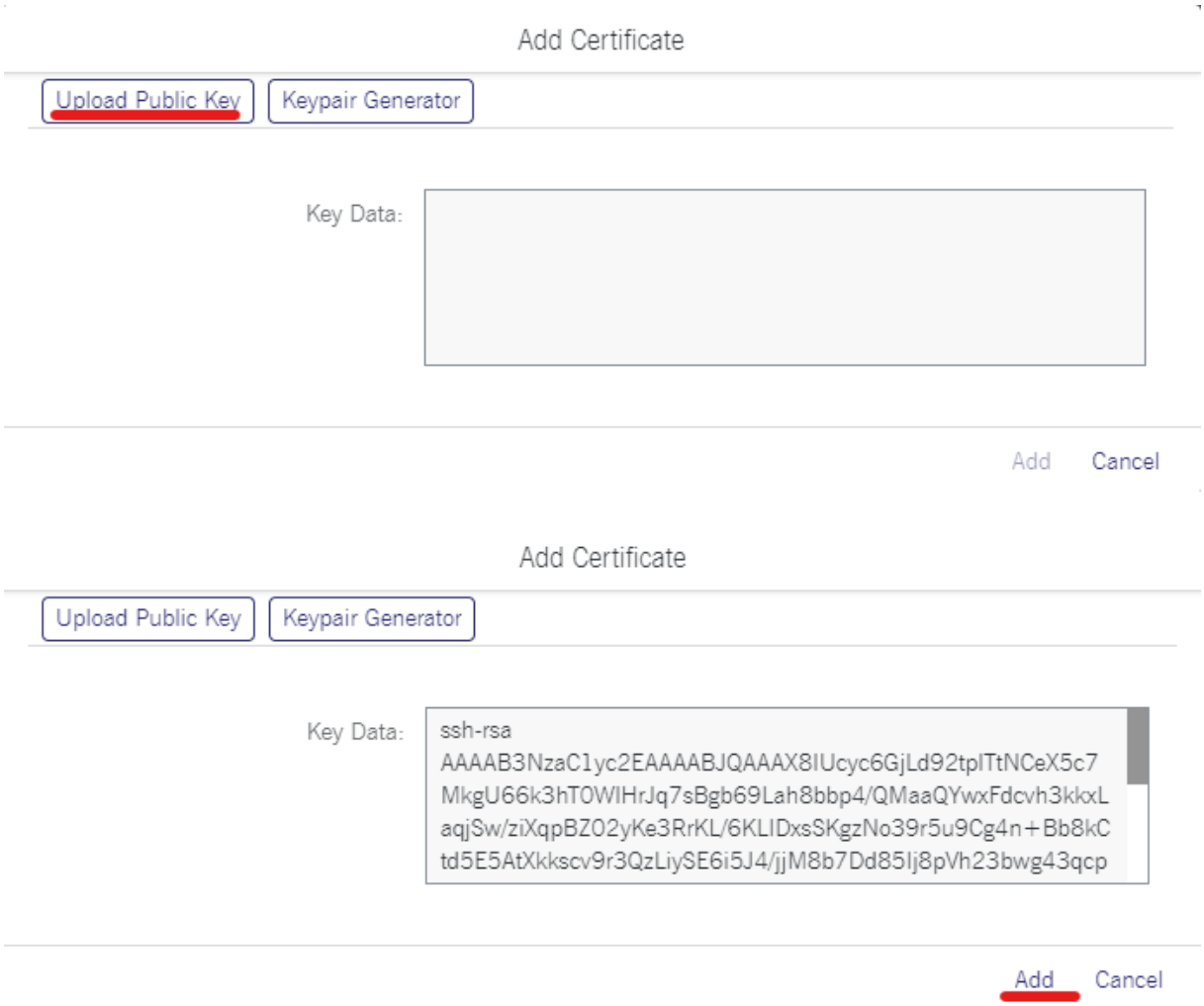
Click on “Create Key” and select “Participant Key” for “Key Type” to upload a key which will be used by all traders of a given business unit. Select the Member ID/Business unit, the desired market (Eurex,

EEX, Xetra, Börse Frankfurt, Vienna, etc.), the environment (production/simulation) and choose an expiration date.

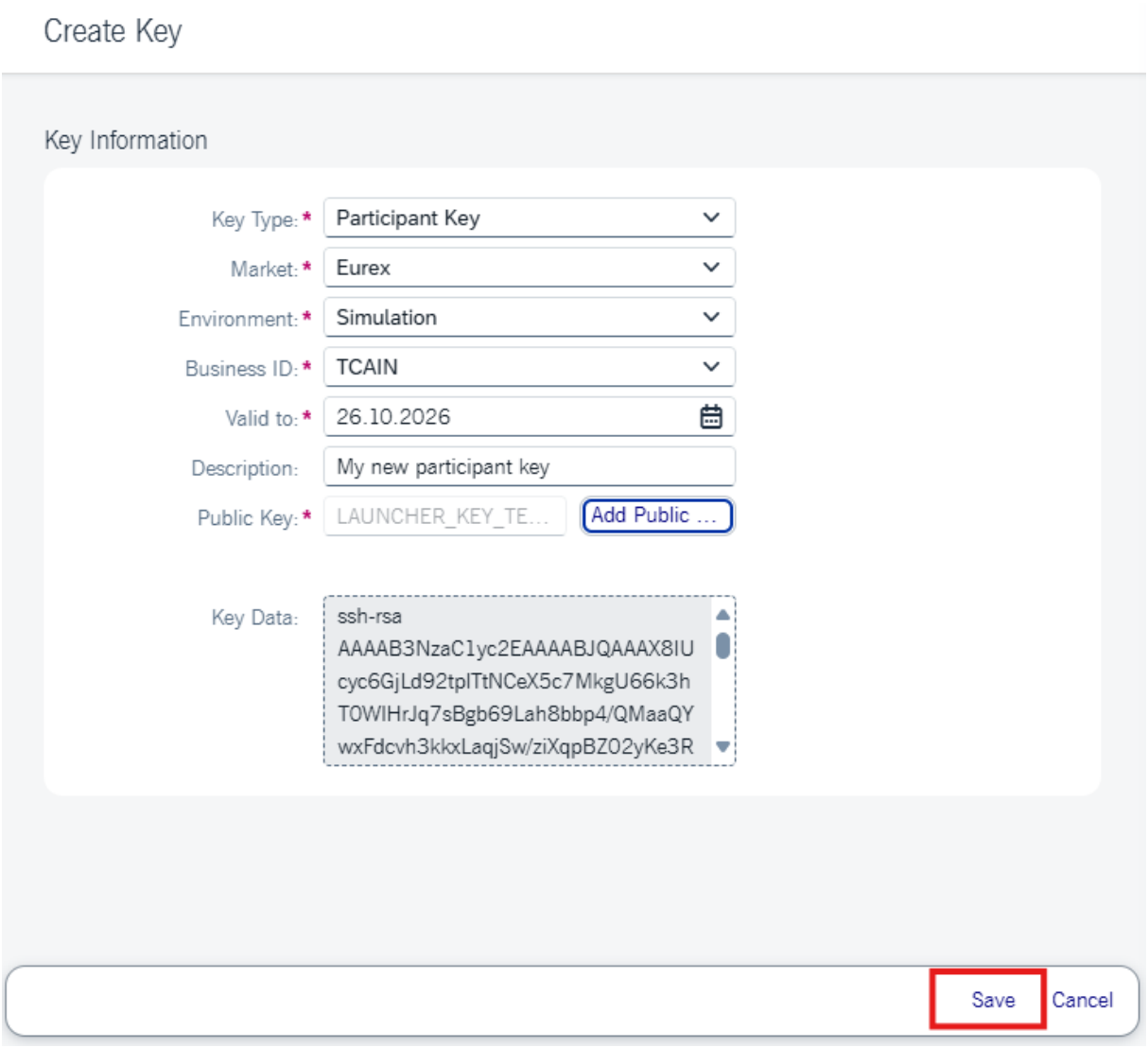
Expired keys will be deleted at the expiry date. Expiry dates can be modified at any time prior to expiry. Additionally, an optional text description can be added.



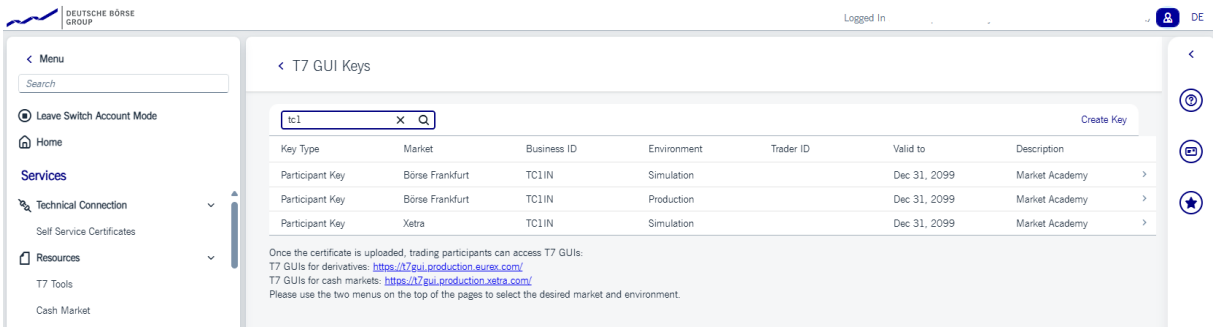
Then click on the “Add Public Key” and then on the “Upload Public Key” button. In the popup window navigate to the public key file you have created previously.



Once the key is selected click on “Add” to close the popup window.



Click on “Save” to complete the key upload. The screen will return to show a list of all already uploaded keys.



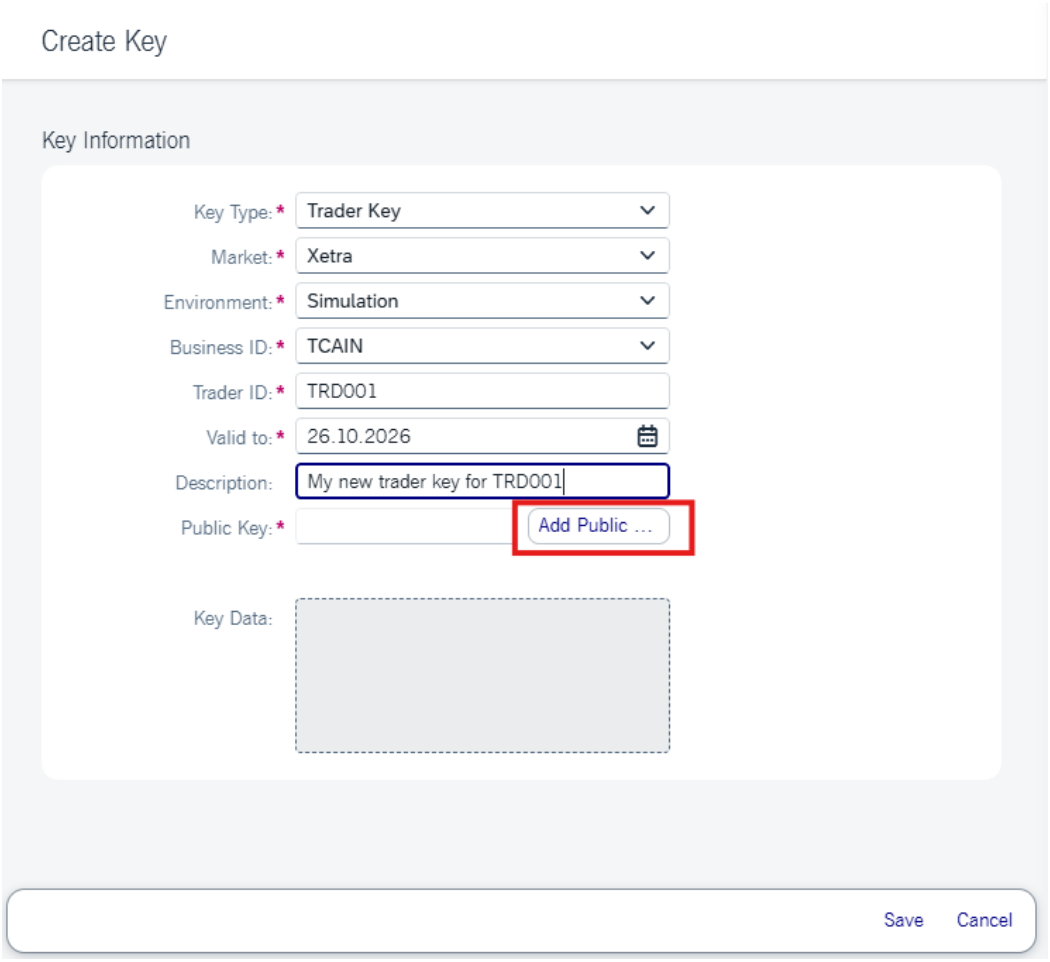
Uploaded keys will be activated and ready to be used within one hour after the upload.

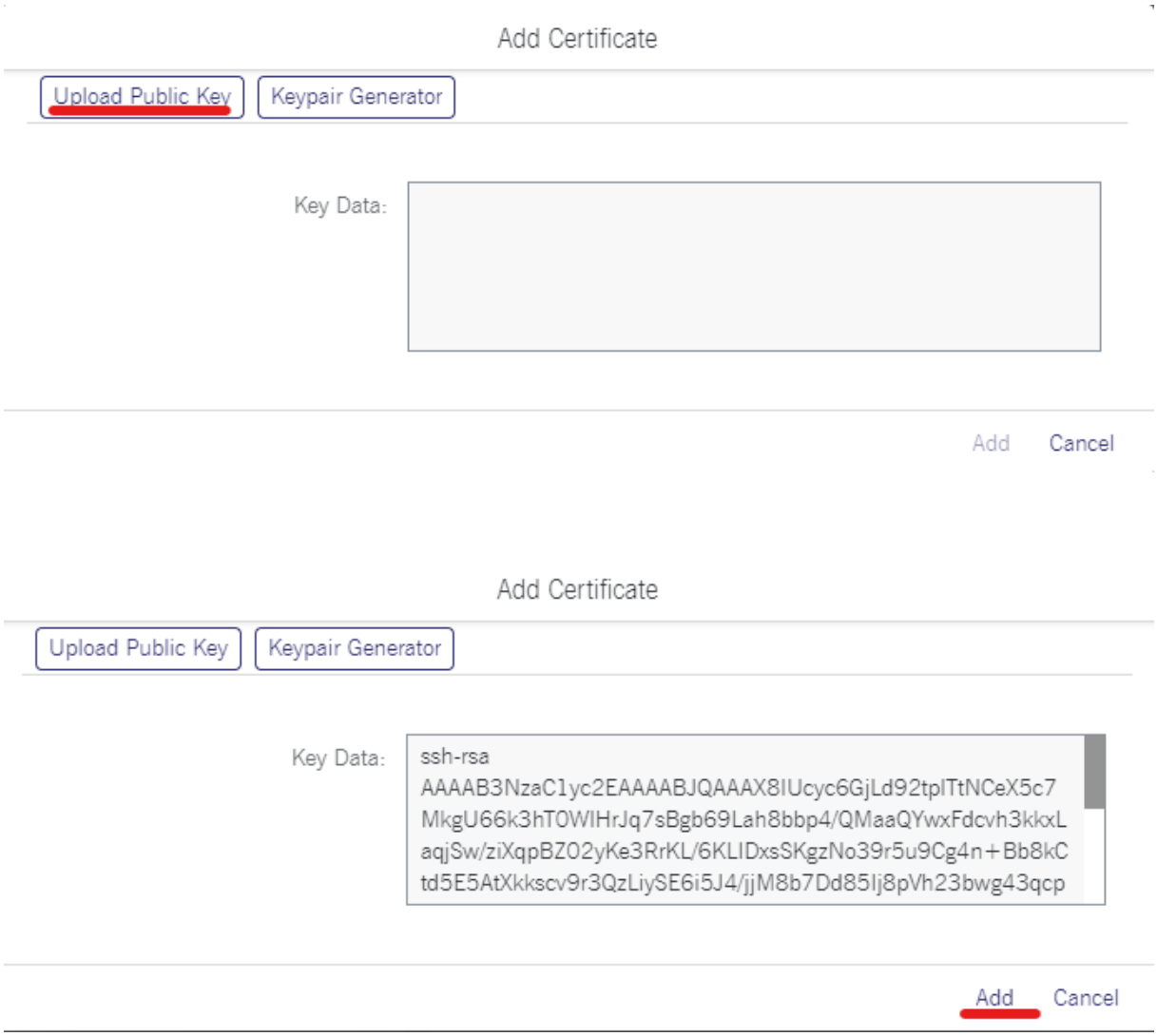
6.3.2 New Trader Key

Click on Create Key" and select "Trader Key" for "Key Type" to upload a key which is used by one individual trader. Select the Member ID/Business unit, the desired market (Eurex, Xetra, etc.), the environment (production/simulation) and choose an expiration date.

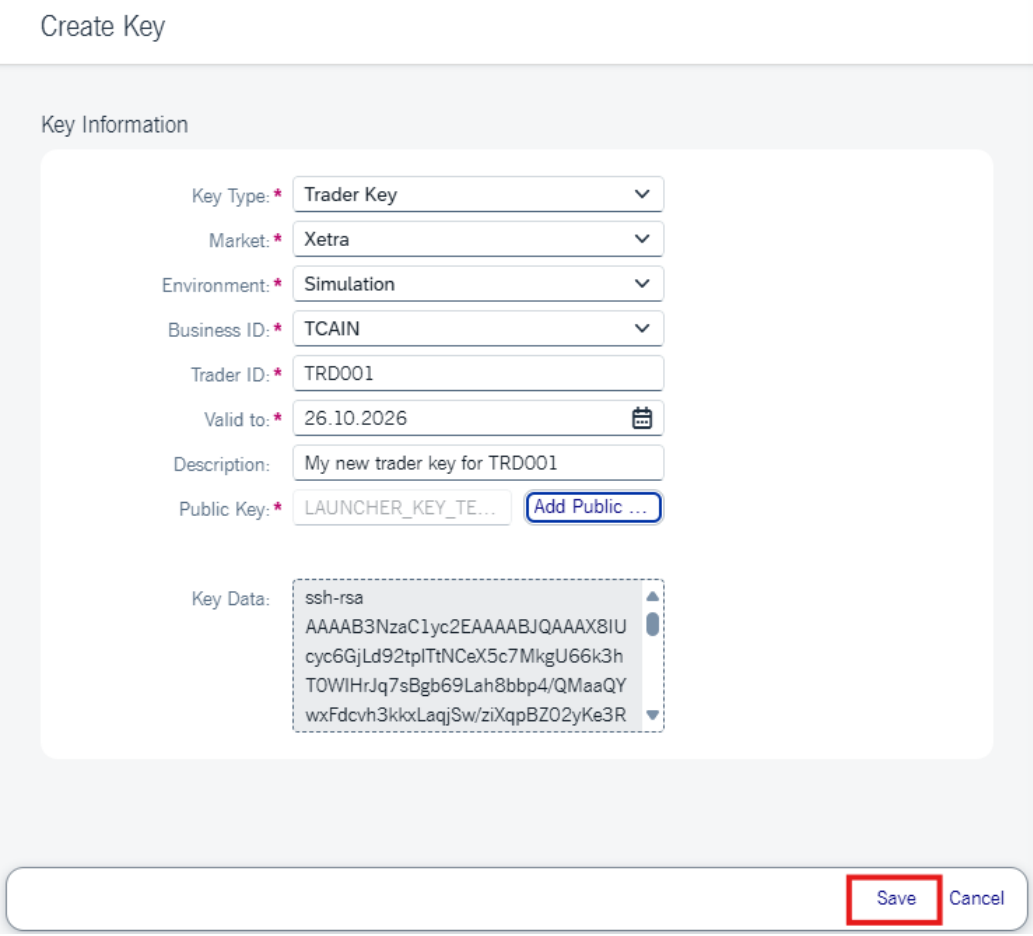
Expired keys will be deleted at the expiry date. Expiry dates can be modified at any time. Additionally, an optional text description can be added.

Then click on the "Add Public Key" and then on the "Upload Public Key" button. In the popup window navigate to the public key file you have created previously.

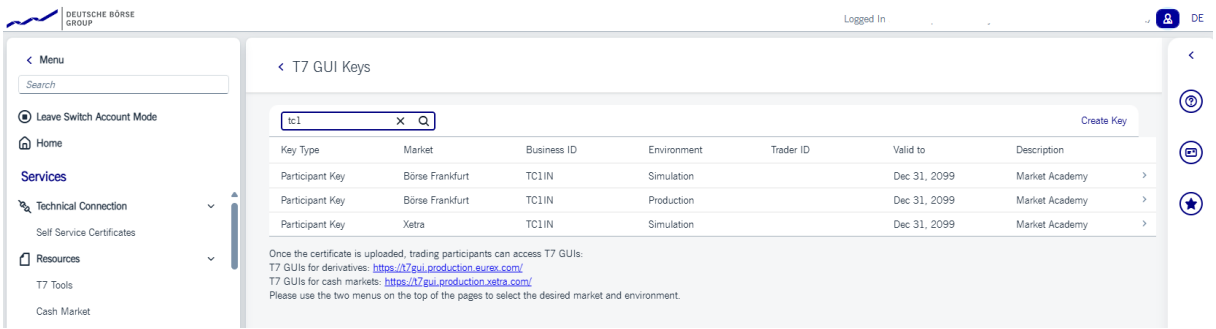




Once the key is selected click on “Add” to close the popup window.



Click on “Save” to complete the key upload. The screen will return to show a list of all already uploaded keys.



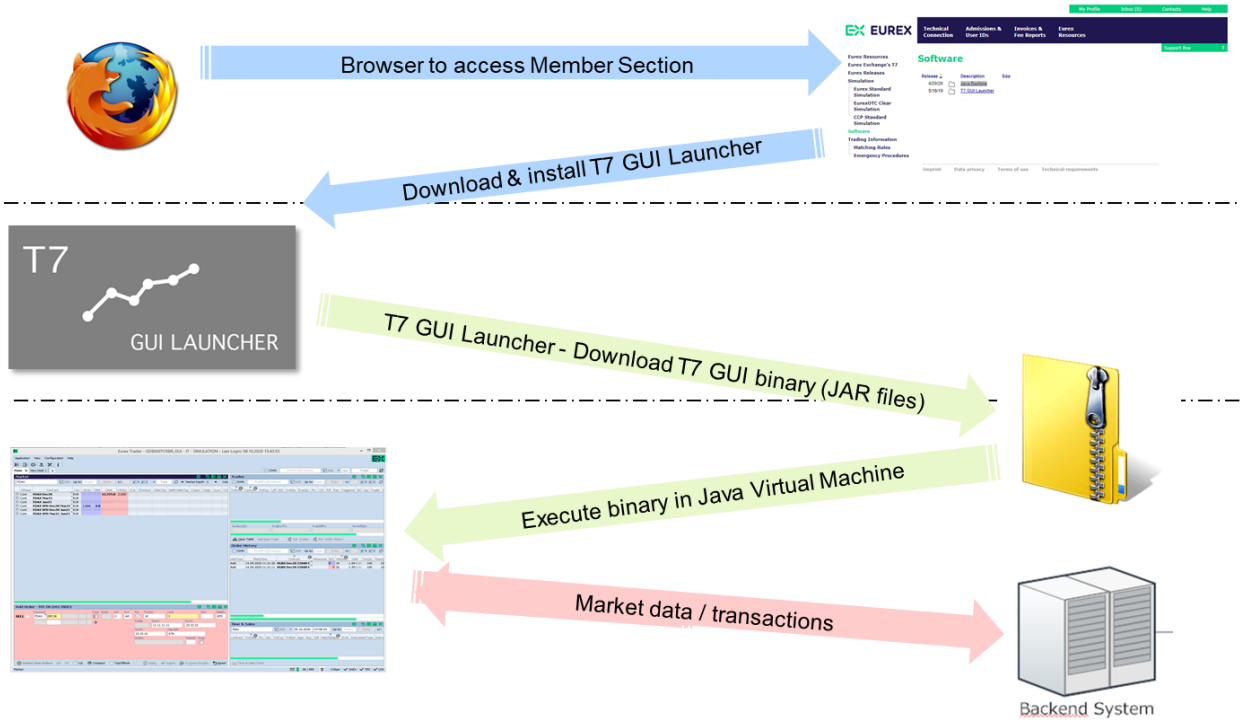
Uploaded keys will be activated and ready to be used within one hour after the upload.

7. Troubleshooting

Although the setup of the T7 Admin GUI, T7 Trader GUI and/or T7 Clearer GUI is straight forward and relatively simple, the following chapters give some advice on troubleshooting in case connectivity cannot established in the first place.

7.1 The tiers of T7 GUI communication

The whole process of starting and running the T7 GUI, including automatic download of the latest version of the GUI binaries consists of two tiers, preceded by the onetime step of downloading and installing the T7 GUI Launcher:



7.1.1 Tier I: Downloading and installing the T7 GUI Launcher (to be done once)

Download the desired T7 GUI Launcher package(s) from the Member Section of eurexchange.com xetra.com. Install the desired connection option (Internet, leased line) as described in chapter 3. This whole process is a one-time process. Once the packages are installed running and updating the actual T7 GUIs will be done from the installed T7 GUI Launcher, which itself will be accessible via several T7 GUI shortcuts on the desktop or within the Windows start menu.

7.1.2 Tier II: T7 GUI Launcher > JAR File delivery

Clicking one of the T7 GUI shortcuts will initiate the T7 GUI Launcher mechanism using getdown to download the T7 GUI in form of a JAR file from the T7 GUI Launcher server. Every time a new GUI version is available on the T7 GUI Launch server, this new version will be downloaded to the client computer. If there is no newer version on the T7 GUI Launch server, the previously downloaded version will be started.

7.1.3 Tier III: Running GUI -> T7 (crypto) proxies

The T7 GUI itself, once running, will open a connection to one of a set of so called “T7 (crypto) proxies). These T7 (crypto) proxies handle incoming T7 GUI communication and forward the communication to the T7 back end. On Internet connections, the T7 (crypto) proxies handle the x.501 GUI key handshake – hence the “crypto” in the name. All available T7 (crypto) proxies are defined in the JNLP files.

The T7 GUI will pick one of the T7 (crypto) proxies listed in the JNLP file to open a communication channel which is then used further on for communication from the running GUI to the T7 back end.

Example Eurex T7 (see chapter 5.4 for other network addresses):

Leased line	Simulation: 193.29.89.224/28, 193.29.95.224/28 Production: 193.29.91.224/28, 193.29.93.224/28
Internet	Simulation: 193.29.90.224/27 Production: 193.29.90.192/27

7.2 T7 GUI Launcher - Frequently asked questions

How can I access the Java Control Panel?

- The Java Control Panel was only relevant for Java Web Start and Java Applets. Since both are not part of open-source Java versions, there is no Java Control Panel in the JRE provided by Deutsche Börse.

Where do I set up my own proxy server if I can only access the Internet via a proxy?

- T7 GUI Launcher tries to determine the proxy settings automatically. If the proxy could not be determined, a dialog pops up for proxy input.

Where could I adjust my Java Cache Size or delete the cache if I wanted to?

- Due to the lack of Web Start and Control Panel there is no Java Cache anymore. The files are copied directly to disk.

7.3 T7 GUI connection error messages

Beginning with T7 release 8.0 the T7 GUIs (the actual T7 GUIs, not the T7 GUI Launcher) can present one of the following error codes while trying to establish a connection to the exchange back end.

`Login failed: CryptoProxy connect failed [Connection refused: connect]`

The CryptoProxy not reachable at the exchange cannot be reached via network.
Possible firewall or routing issue. See the following chapters (7.3 and 7.5) on how to verify basic network connectivity.

`Login failed: Connect failed [WS: WS_PING_FAILED LP: Timeout]`

The GUI connection fails when trying to reach servers deeper in the exchange network.
WebSocket (WS) and/or LongPolling (LP) connection attempts failed. Possible mixup of Internet and Leased Line settings. Prepare GUI logfiles (see chapter 5.3) and contact technical support.

Login failed: Connect failed [WS: UT000122: CONNECT attempt failed as target proxy returned 503 LP: Timeout]

In the GUI dialog "Network Connection Settings" (“Proxy” tab) either a Proxy server has been configured, or "Use OS Setting" is selected with a default proxy configured for the Operating System. The proxy server defined by either one of this means cannot be reached.

Login failed: Connect failed [WS: Could not open public key on server side!]

Affects only Internet connections. The public SSH key on server (exchange) side could not be opened. This can happen when a SSH key is configured in the GUI dialog “Network Connection Settings” (“Security” tab) but the public key for this hasn’t been uploaded to the member section yet (see chapter 6.3), or it hasn’t been transferred from the member section to the exchange back end yet (wait 30 minutes).

Login failed: Connect failed [WS: Could not open public key file.]

Affects only Internet connections. Could not open public SSH key on client side.
A SSH key is configured in the GUI dialog “Network Connection Settings” (“Security” tab) but the public key specified cannot be read (or found) by the local file system.

Login failed: Connect failed [WS: Could not open private key file.]

Affects only Internet connections. Could not open private SSH key on client side.
A SSH key is configured in the GUI dialog “Network Connection Settings” (“Security” tab) but the private key specified cannot be read (or found) by the local file system.

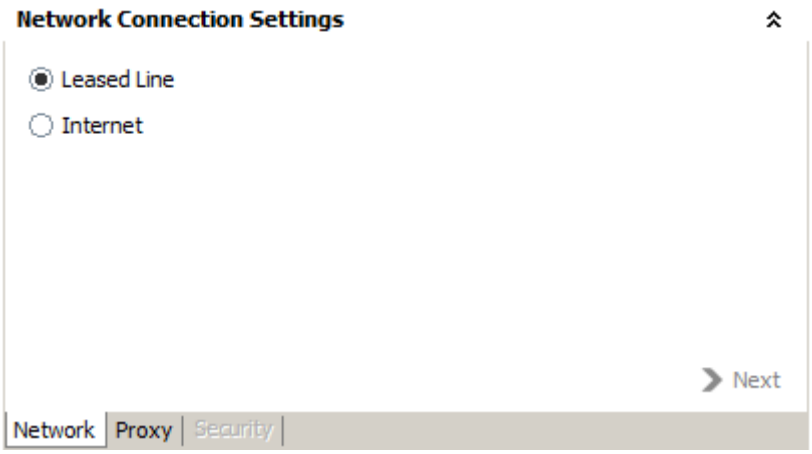
Login failed: Connect failed [WS: Wrong private key password!]

Affects only Internet connections. Wrong private key password.
A SSH key is configured in the GUI dialog “Network Connection Settings” (“Security” tab) but the private key specified cannot be accessed with the passphrase specified in the field “Private Client Key Password” in the login mask.

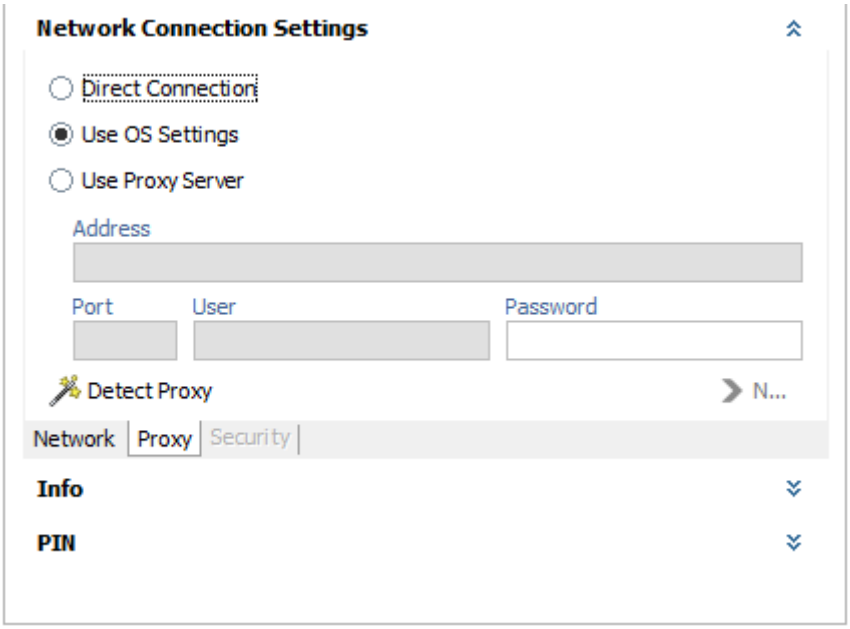
Apart from the technically error messages, all regular login errors about the entered trader/user ID and the entered password will be displayed as “Wrong user or password” in the login window.
In this case, verify that the user ID is spelled correctly, and the password is still valid and has been typed correctly (check keyboard language settings).

7.4 Verify connectivity, Internet

The selected T7 GUI will start after the download/update process has been completed. In the login screen, open network settings and select Internet.

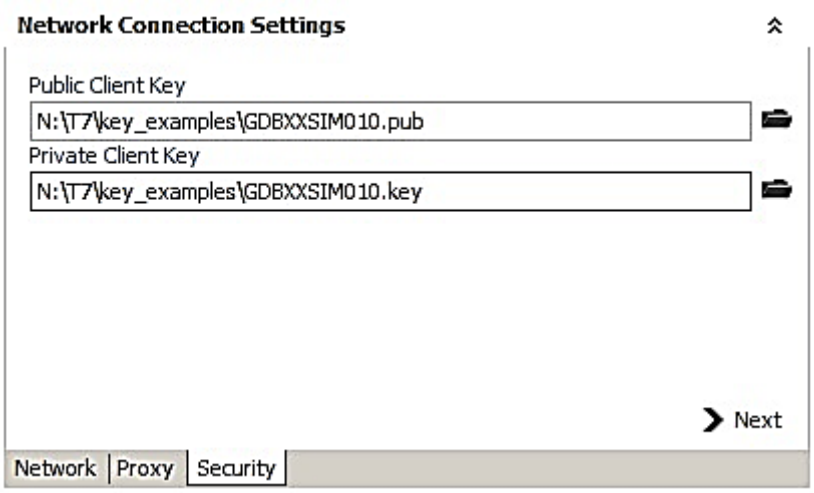


If present, specify a local proxy server on the 2nd tab. If your proxy server requires authentication, please specify username and password for your proxy authentication too.

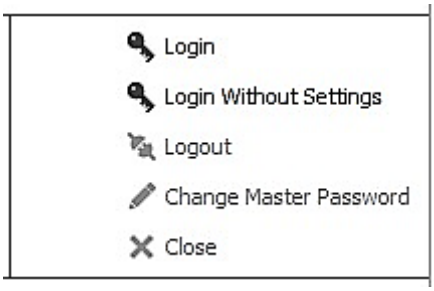


Please note: Detailed proxy settings can be specified within this dialog, by activating “Use Proxy Server”. When no local proxy is used at all for the T7 GUI connection, “Direct Connection” must be selected.

On the third tab point to your public **and** private SSH key, matching the previously uploaded public key.



After the required configuration is complete, the Login button becomes active. Clicking on the login button connects the T7 GUI with the exchange. If not, verify the data entered in the network settings of the T7 GUI.



Alternatively test the network connectivity from the client computer to the Deutsche Börse Servers by the following commands (if netcat is present. Alternatively use telnet):

Xetra Production

```
nc -z -w5 guiproxyp1.xetra.com 80
nc -z -w5 guiproxyp2.xetra.com 80
```

Xetra Simulation

```
nc -z -w5 guiproxys1.xetra.com 80
nc -z -w5 guiproxys2.xetra.com 80
```

Eurex Production

```
nc -z -w5 guiproxyp1.eurexchange.com 80
nc -z -w5 guiproxyp2.eurexchange.com 80
```

Eurex Simulation

```
nc -z -w5 guiproxys1.eurexchange.com 80
nc -z -w5 guiproxys2.eurexchange.com 80
```

7.5 Verify connectivity, leased line

7.5.1 Simple checklist for simulation network configuration test via leased line

Please note: IP addresses below are an example for Eurex simulation only. See chapter 5.3 for other markets and for production addresses.

1.) Find the correct member LAN to connect from. In the member portal, go to “Request & Configuration”. Get an X-Con for ETI and/or GUI channel. Take note of the “MEMLAN IPnet”. This is the network from which you should connect:
2.) Find the router assignment to back end half “A” and “B” in the same X-Con
3.) For initial testing put a computer into the assigned member LAN.
4.) Add three static routes to this computer

`route 193.29.89.224 255.255.255.240` -> pointing to router for BE half “A” (alternative subnet naming 193.29.89.224/28)

`route 193.29.95.224 255.255.255.240` -> pointing to router for BE half “B” (alternative subnet naming 193.29.95.224/28)

`route 193.29.93.173 255.255.255.255` -> pointing to either one of the routers or a virtual HSRP address.

5.) Test basic connectivity using telnet on the test computer

`telnet 193.29.93.173 80` -> you should get an open port on a webserver

`telnet 193.29.89.225 80` -> you should get an open port

`telnet 193.29.95.225 80` -> you should get an open port

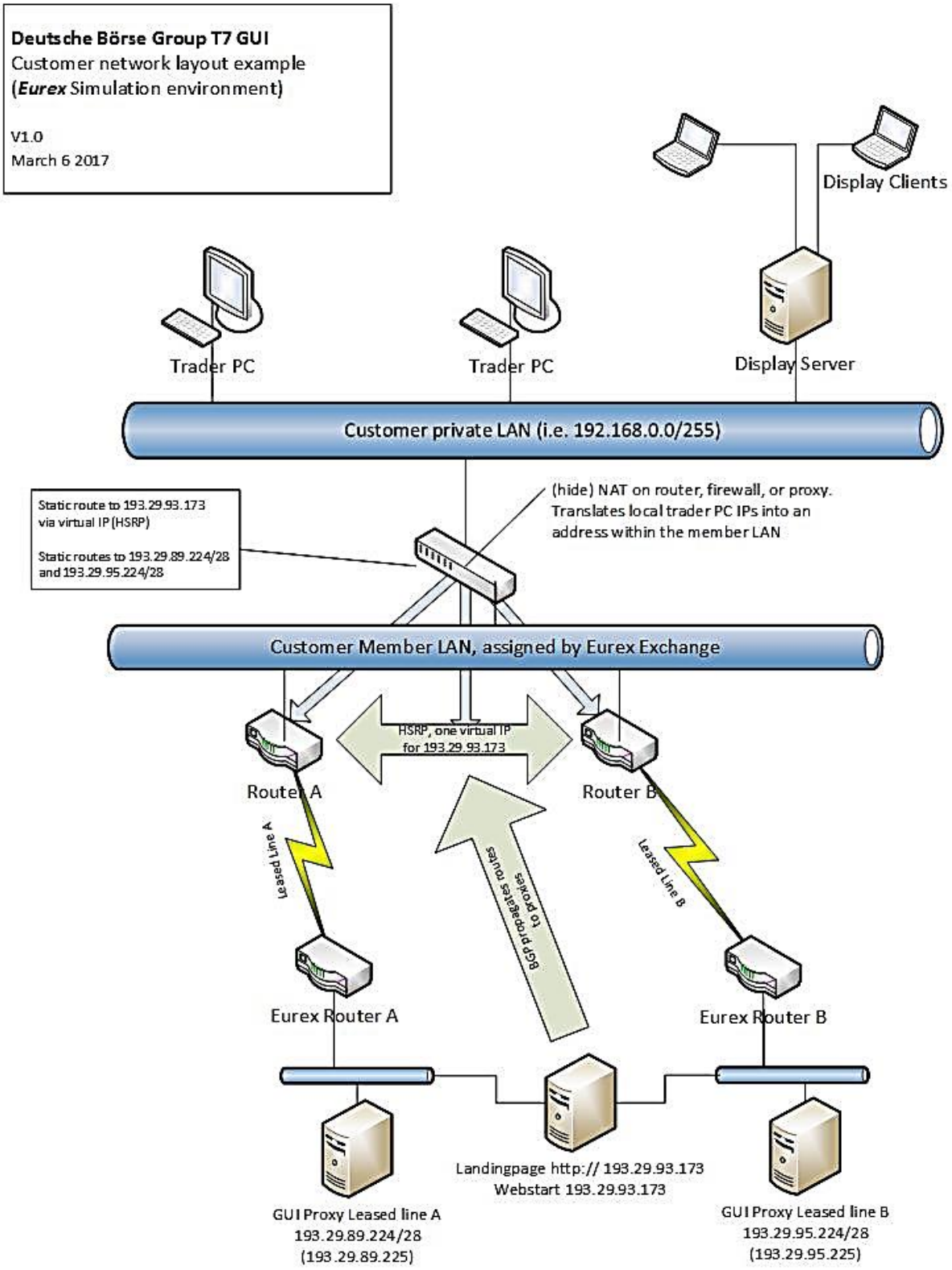
(use port 8089 instead of port 80 to test T7 Trader GUI on a dedicated GUI channel on leased line)

6.) Verify with the GUI software (only if the telnet tests above were successful)
Open URL http://193.29.93.173 in a browser on the test computer
Click on the “T7 Admin GUI” link for Simulation. -> The T7 GUI Launcher will initiate, download the GUI and start it.
Provide a trader ID (ending with “_GUI”) and a password. Make sure you enter letters in the password as **uppercase**. Click on “Login”.
After a while, reference data will be downloaded and the Welcome Screen of the Admin GUI will open.
If not, verify that the proxy settings for Web browser, Java and T7 GUI are set according to local requirements on the client computer.

If all above works, add HSRP fail-over for 193.29.93.173 if desired. Add NAT’ing device between Member LAN and trading floor network.

See chapter 5.4 for other markets and for production addresses.

7.5.2 Example simulation network setup, leased line



7.5.3 Application test over leased line

Verify that routes to the addresses listed in chapter 5.4.2 are present in your local network, pointing to your leased lines and the resolve the FQDN hostnames listed in chapter 5.4.2 to the IP addresses listed there.

Verify local proxy settings. If a local proxy is present and used by the web browser for accessing the Internet, ensure that an exception for the IP addresses listed for LeasedLine access in chapter 5.4.2 has been created as described in chapter 5.4.4.

Clicking on any of the presented T7 GUI links will trigger the T7 GUI Launcher process. If a local proxy server is present, this should be configured in the T7 GUI. Verify that routes to the IP addresses listed in chapter 5.4.2 are present in your local network, pointing to your leased lines.

The selected T7 GUI will start after the T7 GUI Launcher process completes. In the login screen, open network settings and select leased line.

Clicking on the login button connects the selected T7 GUI with the exchange. If not, verify that routes to the proxy addresses listed in chapter 5.3 are present in your local network, pointing to your leased lines. Note: you need to have routes set to both networks per environment if you use two leased lines for redundancy.

7.6 Related Documents

Documents related to T7 are available on the Eurex website

http://www.eurex.com > Support > Initiatives & Releases > T7 Releases

And on the Xetra website

http://www.xetra.com > Technology > T7 Trading Architecture > System Documentation

The following documents may be of interest for user of the T7 GUIs:

Document	Description
Participant and User Maintenance Manual	• A document assisting service administrators maintaining participant and user related data in Eurex Exchange's T7.
T7 GUI – Manual	• A document providing a detailed description of the T7 GUI solutions, the T7 Trader GUI, T7 Admin GUI and the T7 Clearer GUI.
N7 Network Access Guide	• A document providing details on the network access options for the various interfaces T7, F7 and Eurex Clearing. It includes detailed technical background information, such as router equipment information and port numbers for the configuration of firewalls.
T7 Disaster Recovery Concept	• A document describing the measures, which need to be taken in the unlikely event of a complete failure of the main T7 data center.

7.7 Contacts

For any questions, you may have about GUI setup process please contact your Technical Account Manager using your VIP number or e-mail cts@deutsche-boerse.com.

For questions regarding the Member Section please contact the Member Section Team Tel: +49-69-211-1 78 88 or e-mail member.section@deutsche-boerse.com.

8. Change log

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

No	Date	Chapter	Change
1.0	26 July 2012	-	Creation of document
R13.0 Version 1	01 July 2024	All	Updated for Release 13.0 – no content change
R13.1 Version 1	28 February 2025	All 7.6	Updated for Release 13.1 – no content change Chapter removed to reflect current GUI
R13.1 Version 2	23 June 2025	1.4.1	Added Microsoft Windows 11 to the supported OS
R14.0	08 July 2025	All	Updated for Release 14.0 – Member Section screenshots updated to new design
R14.0	16 Sep 2025	4.1, 4.2	Added chapter 4.1.12, 4.1.13, 4.1.14 and updated screenshots in 4.2