

Common Report Engine User Guide

Version 6.8

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List of Abbreviations

| | |
|----------|--|
| AP | Access Point |
| CRE | Common Report Engine |
| DBAG | Deutsche Börse AG |
| DSA | Digital Signature Algorithm |
| ECAG | Eurex Clearing AG |
| IETF | Internet Engineering Task Force |
| MiFID | Markets in Financial Instruments Directive |
| MISS | Member Integration System Server |
| PuTTYgen | Putty Key Generator |
| RC | Registered Customer |
| RRH | Regulatory Reporting Hub |
| RSA | Rivest, Shamir and Adleman (public-key cryptosystem) |
| SFTP | SSH File Transfer Protocol |
| SSH | Secure Shell |
| VPN | Virtual Private Network |

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1 General information

The Common Report Engine (CRE) allows a centralized provision of reports and non-transactional files from multiple exchange markets.

The service is provided as an SFTP server and allows participants to easily retrieve all of their reports and non-transactional files from a single source.

This service is independent from the existing trading and clearing infrastructure, and participants can choose their preferred hardware platform and operating system.

Communication with the CRE is based on OpenSSH. The OpenSSH server authenticates users using the standard methods supported by the SSH protocol (<http://www.OpenSSH.com>).

All examples provided in this document refer to either the OpenSSH distribution or the PuTTY installable package for Windows.

1.1 Intended audience

This document is intended for system developers, system and security administrators maintaining their systems to interact with the CRE service offered by DBAG. It assumes that the reader is familiar with OpenSSH public/private key pair authentication methods (i.e. handling of public/private key pair) and the use of SFTP clients and/or scripts.

The purpose of this document is to provide an overview on how to obtain access to the CRE, how to deposit keys in the DBAG Member Section (User Administration) and how to manage the downloading of files and reports.

1.2 Conventions used in this document

Cross-references to other sections within this document are always clickable, but not marked separately. Hyperlinks to webpages are blue and underlined.

1.3 SSH File Transfer Protocol

This document refers to "SFTP" in numerous instances. To avoid misunderstandings, "SFTP" stands for the SSH File Transfer Protocol as defined here: <https://www.sftp.net>

1.4 SSH/SFTP tools

While access to SSH based services is part of most Unix based distributions, PuTTY is an open source software that is available for MS Windows. It can be used to easily establish SSH and SFTP sessions (<http://www.putty.org>).

1.5 Change Log

- Deleted Solaris examples & changed time it takes to be setup on the CRE in Chapter 3
-

2 Overview

2.1 History

Deutsche Börse has provided a Common Report Engine (CRE), which was introduced as part of the Eurex Technology Roadmap in the second quarter of 2011 for Eurex, Xetra and CCP. In 2012, the CRE service was extended to DBAG Partner Exchanges such as the Malta Stock Exchange, the Bulgarian Stock Exchange and the European Energy Exchange. From 2018, the Regulatory Hub and Eurex Repo were added.

The CRE offers participants a way to retrieve all reports and files for all environments of the respective markets independent from the exchange trading and clearing infrastructure. The CRE is the sole source for all trading and clearing relevant reports and files for T7 cash and derivatives markets, Eurex Clearing's C7, EurexOTC Clear, Eurex Clearing Prisma, Regulatory Hub and Eurex Repo.

2.2 Features and functionality

- Report Selection: The report selection mechanism differs from market to market as described below:
 - For T7 cash and derivatives markets, Eurex Clearing's C7, EurexOTC Clear, Eurex Clearing Prisma and Regulatory Hub all reports and files are generated by default and are made available via the CRE. Participants can download the reports and files they are interested in.
 - CCP participants need to pre-select reports they would like to receive via the CRE on the Securities Clearing GUI. Only the GUI selected reports are provided.
 - Xetra Release 17.0 participants need to pre-select the reports they would like to receive via the CRE on the J-Trader GUI. Only the selected reports are provided including bilateral aggregation reports. Note that performance reports for Specialists and Designated Sponsors, as well as an instrument reference data file will be provided by default.
- An extended history of minimum 10 business days is kept on the CRE.
- Participants may set up more than one connection to the CRE to access the CRE from different locations depending on their business requirements.
- The reports can be downloaded manually or automated (by using a script).
- All end-of-line encodings are streamlined to <CRLF>.

2.3 Security, Authorisation and Access

In general, the setup process for the participant involves the following three steps:

1. *Generating an OpenSSH compliant public/private key pair*
2. *Creating a CRE user and uploading the public key in the DBAG Member Section*
3. *Logging into the CRE and downloading reports via SFTP client*

To provide a secure service, the OpenSSH authentication method is used. This method requires an OpenSSH compliant public/private key pair, which the participant has to generate. This process ensures that the participants authenticate themselves against the CRE. The public key has to be generated and uploaded to the DBAG Member Section, while the participant will keep the private key. By using a key-based authentication method, no login passwords have to be transferred over the Internet at any time.

- Participants need to provide a public/private key pair to access their reports. It is recommended to limit access to the CRE using dedicated IP addresses.
-

- Security of data will be ensured by the usage of SSH2.

The illustration below provides an overview on how to access the CRE and how to set up the access process in order to download all necessary files.

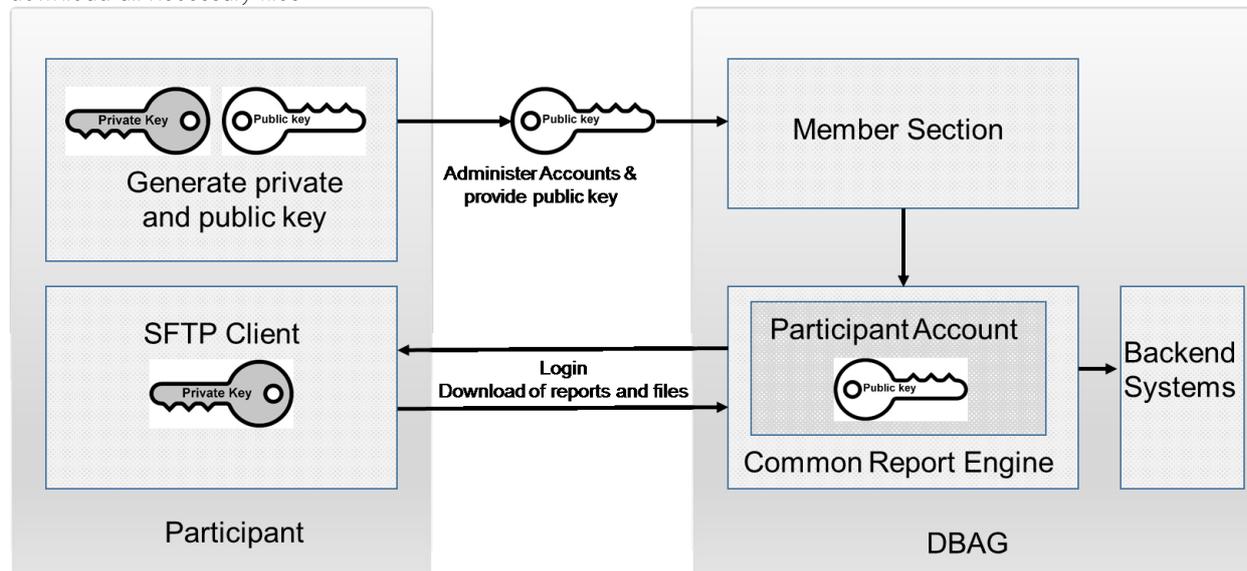


Fig. 1: Process overview to connect to the CRE

Note: The figure above is not a true representation of servers and networks involved, but rather provides a simplified functional overview.

The public key will be provided to the CRE via the Member Section.

The private key always remains in the hands of the CRE user. The CRE user will need the individual private key at any time a login to the CRE is committed.

It is recommended to create a public/private key pair for every user connecting to the CRE.

2.4 Hardware requirements

There are no particular hardware requirements to access the CRE servers. The CRE servers can be accessed from any computer running the SFTP client program.

2.5 Software requirements

A SFTP client compliant with a current SSH2 version is required in order to connect to the CRE.

- OpenSSH provides a large suite of secure tunnelling capabilities, several authentication methods, and sophisticated configuration options.
- DBAG has disabled all known insecure Ciphers, Key Exchange Algorithms and MAC Algorithms for the SSH server.

Known secure parameters for each method are listed below:

Key Exchange Algorithms:

- ✓ curve25519-sha256
- ✓ curve25519-sha256@libssh.org
- ✓ diffie-hellman-group18-sha512
- ✓ diffie-hellman-group14-sha256
- ✓ diffie-hellman-group16-sha512

-
- ✓ diffie-hellman-group-exchange-sha256
 - ✓ ecdh-sha2-nistp256
 - ✓ ecdh-sha2-nistp384
 - ✓ ecdh-sha2-nistp521

Ciphers (encryption Algorithms):

- ✓ chacha20-poly1305@openssh.com
- ✓ aes256-gcm@openssh.com
- ✓ aes128-gcm@openssh.com
- ✓ aes256-ctr
- ✓ aes192-ctr
- ✓ aes128-ctr

MAC Algorithms:

- ✓ hmac-sha2-512-etm@openssh.com
 - ✓ hmac-sha2-256-etm@openssh.com
 - ✓ umac-128-etm@openssh.com
 - ✓ hmac-sha2-512
 - ✓ hmac-sha2-256
-

3 Setup process

3.1 How to generate and save SSH key pair

As mentioned in chapter 2, public/private keys are used for authentication by the CRE infrastructure. The participant must generate the pair of keys.

- It is required to use a minimum of 2048 bits for the generated key. The key type must be SSH2 RSA or DSA (RSA is faster in authentication). Once the parameters above are set the key can be generated.
- The key generation process will produce public and private keys. See details about key handling and usage in sections below.
- Save the public key files and private key files for future use.
- In no case should the **private key** be transferred over an insecure network, e.g. via e-mail, and it should always be kept only by the participant.
- It is highly recommended to protect the key file with a passphrase. This will encrypt the private key when it is saved in a secure location on the local machine. Using passphrases for batch SSH-keys requires familiarity with the SSH-agent authentication subsystem. Participants should be aware that the use of strong encryption methods and encrypted SSH-keys is advisable but will raise administration efforts and system complexity.
- To generate an SSH public/private key various freeware tools are available for download from the Internet, such as PuTTY or OpenSSH.

3.2 Example for key generation using PuTTYgen (MS Windows)

See the following example of key pair generation.

- Make sure to have the latest stable version of PuTTYgen.
 - Set key parameters type and bit number as shown below.
 - Follow the instructions on the screen and move the mouse over the blank area for a while.
-

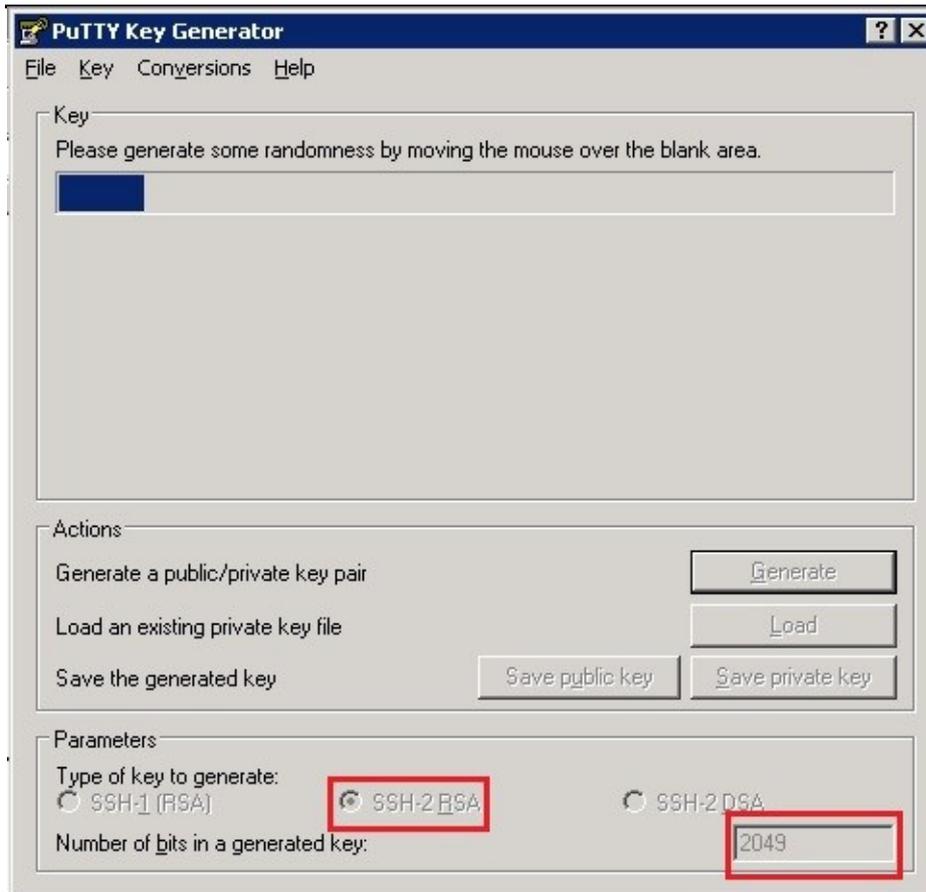


Fig. 2: Generate key (screenshot of PuTTYgen)

- Please note: In some rare cases, one key bit is not recognised by the DBAG Member Section. Therefore, it is advisable to generate a key with a minimum of 2049 bit before uploading the public key into the DBAG member section.
- The private key must be accessible for the participant's SFTP client in order to login successfully. By clicking the buttons highlighted in Figure 3, participants can save their private and public keys in the PuTTY format for further use with the PuTTY tools or WinSCP.

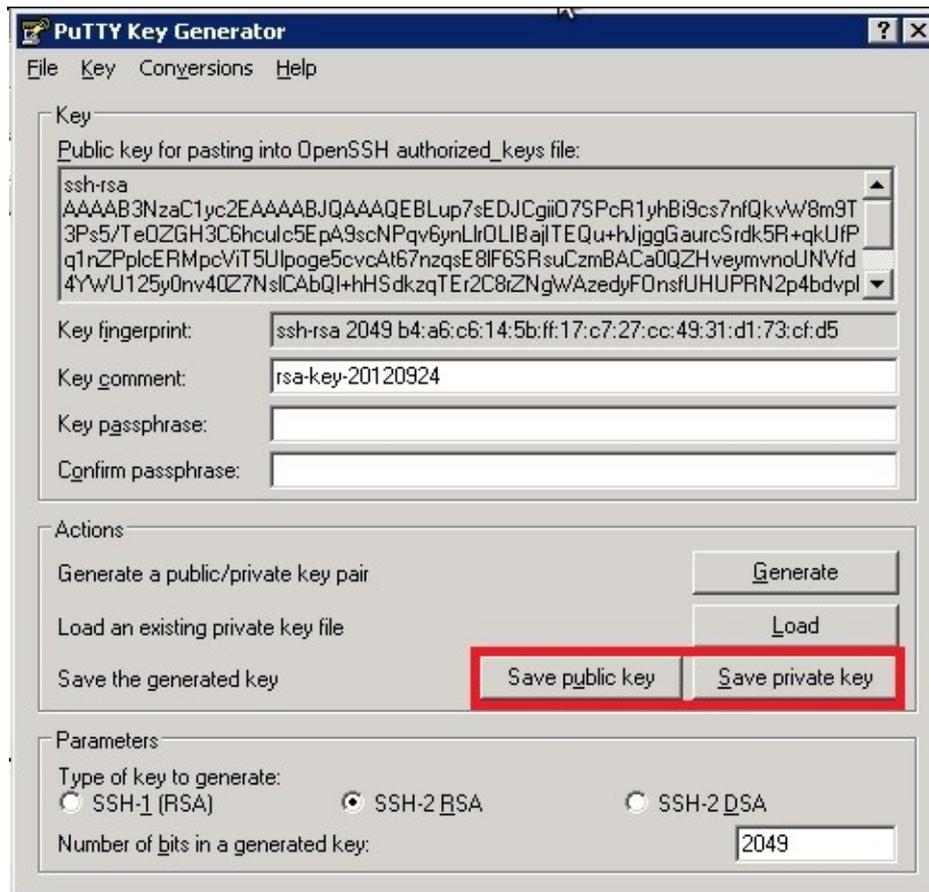


Fig. 3: Saving the generated public and private keys in the PuTTY format (screenshot from tool PuTTYgen)

- The OpenSSH private key can also be exported in the OpenSSH format for use with other software working with OpenSSH keys (such as Unix SFTP).

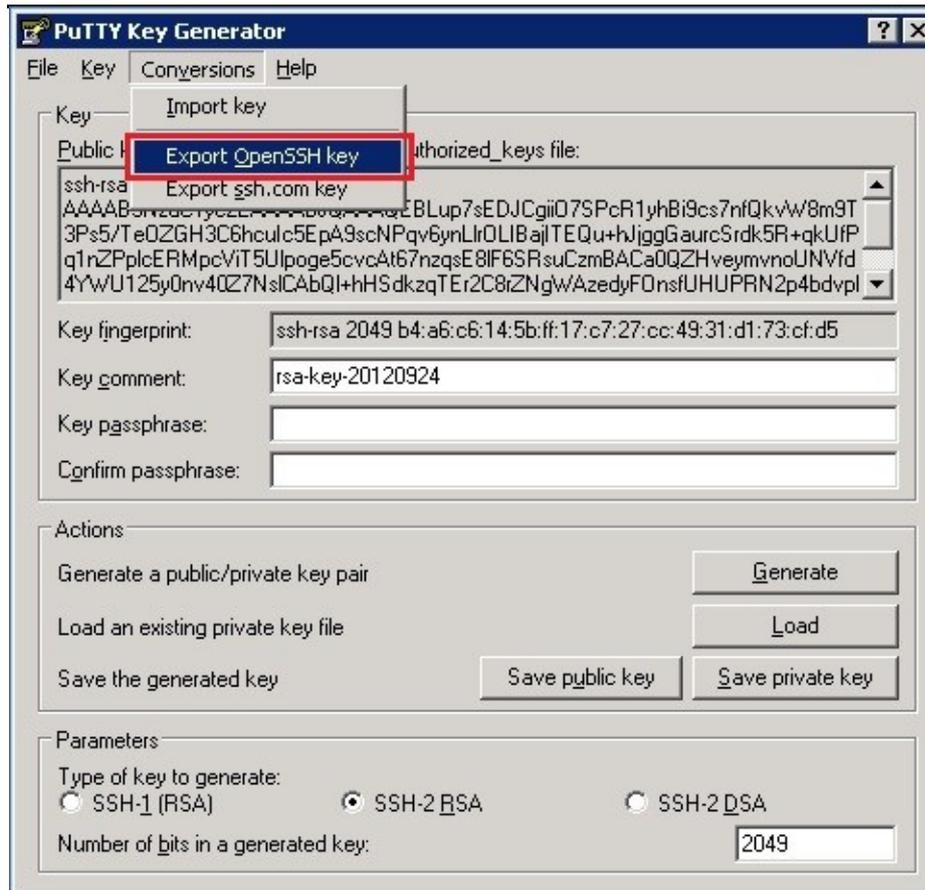


Fig. 4: Saving the OpenSSH private key for future use (screenshot from tool PuTTYgen)

- The public key must be saved in OpenSSH format to be uploaded to DBAG Member Section.
- Copy the marked text from PuTTYgen to a text editor, such as notepad and save it with the extension .pub.
- Make sure that this line has no "End Of Line" character (EOL) at the end!

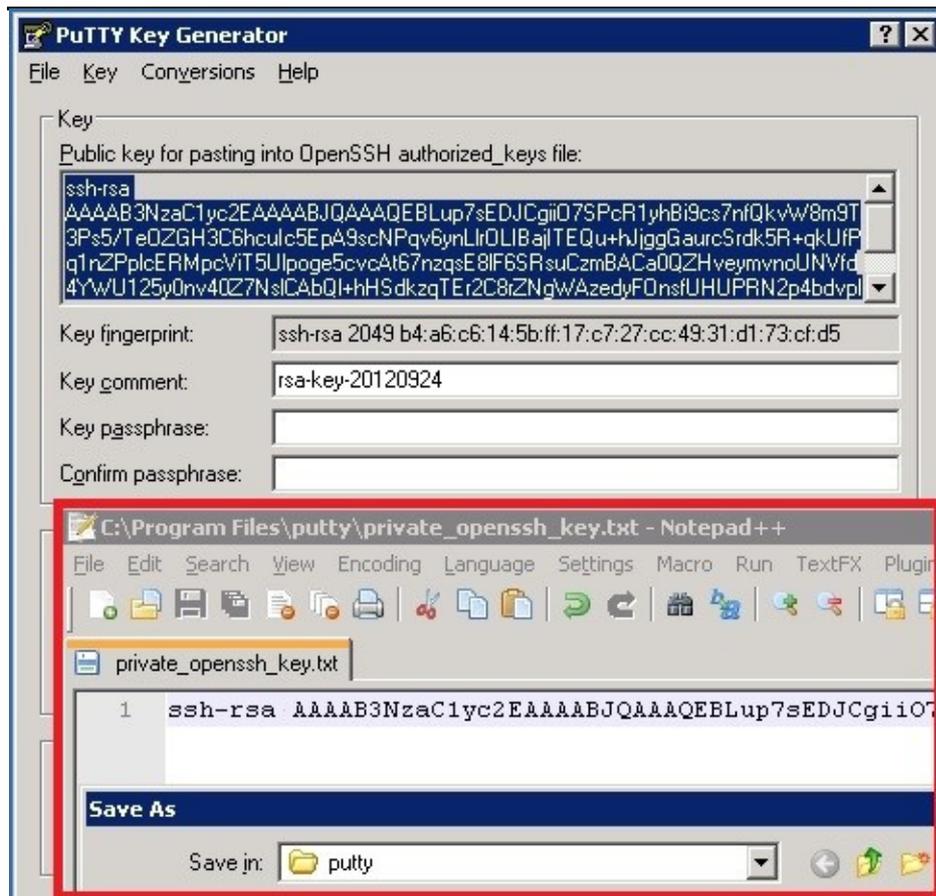


Fig. 5: Saving the public key for DBAG Member Section upload (screenshot from tool PuTTYgen and Notepad++)

- Public keys must consist of one line only. Only public OpenSSH keys in this format can be used with the CRE and can be successfully uploaded in the DBAG Member Section.
- After uploading, the participant must wait for the configuration data (users, keys, markets, etc.) to be transferred to the CRE database. Usually this processing takes place in the late evenings.
- In general, access to the CRE will be possible after two business days. (After the first business day you have access and see empty folders, after the second business day upload of reports and files is possible.)
- Changes to existing users will take effect on the next day.

Please note that the public key does NOT have to be signed by a certification authority of the participant for the use with the CRE.

3.3 CRE user administration

Before the CRE can be accessed, a CRE user account has to be set up and the OpenSSH public key has to be uploaded in the DBAG member section. This task can be performed by the "Technical User Administrator". "DBAG Member Section" <https://member.deutsche-boerse.com> -> "Technical Connection"-> "Technical User Administration"-> "Report Engine User" Administration rights to become a "Technical User Administrator" may be requested using the DBAG member section.

The screenshot shows the 'Report Engine User' page in the DBAG member section. The left navigation menu includes: Technical Connection, Membership, Incident Tickets, Requests & Configuration, Monitors and Statistics (with sub-items: Connection Monitors, Roundtrip Statistics Values, Roundtrip Statistics, TCP/IP Roundtrip Statistics, Realtime Backend Event Log, Broadcast Latency Report, X-Chart, Special Monitors), **Technical User Administration** (with sub-items: Download Agent, Eurex OTC Clear FpML Account, T7 GUIs, FIXML Account, Eurex Clearing GUIs Network Configuration, Eurex Repo Certificates, Enhanced Risk Solution Account, Margin Calculator API Account), **Report Engine User**, Downloads (with sub-items: Analysis Tools, Reference Files), Admissions & User IDs, and Invoices & Fee Reports.

The main content area features the heading 'Report Engine User' and a description: 'CRE (Common Report Engine) is a service which offers single Advanced Simulation environments. Information: Please do not add more than 13 environments. When new data is entered for reports, two batch runs are performed for download by the member. All other actions are available in the portal to CRE (Monday - Friday at 10 p.m.).'

Below the text is a table with two buttons: 'Create User' and 'Delete User'. The table lists existing users with their User IDs:

| | User ID |
|--------------------------|----------------|
| <input type="checkbox"/> | 1027709_000001 |
| <input type="checkbox"/> | 1027709_000002 |
| <input type="checkbox"/> | 1027709_000003 |
| <input type="checkbox"/> | 1027709_000005 |
| <input type="checkbox"/> | 1027709_000006 |

Fig. 6: CRE users must be maintained in the DBAG member section

An overview of all existing and already created CRE users will be displayed. It is possible to edit, modify or delete existing CRE users by simply selecting them from the list.

All CRE users can be identified by their UserID, which is generated during the account setup process. A UserID looks like this example: 1027709_000001

- The first part, 1027709 is the so-called DBAG business partner ID which is used in the DBAG Member Section for identification of a customer of Deutsche Börse AG. A business partner may have different memberships on Eurex and Xetra; each membership is represented by a Member ID.
- The second part, 0000001 is a sequential number, automatically assigned by the system.

In addition, new CRE users can be created in the DBAG Member Section:

The new input screen will be opened by clicking on "Create User" where all necessary user information needs to be entered.

Report User Information

Description:

UserID:

Report Engine Configuration

| MemberID | Market | Environment |
|----------|--------|-------------|
|----------|--------|-------------|

Network Data

Certificates

| Status | Valid From | Valid To | Comment |
|--------|------------|----------|---------|
|--------|------------|----------|---------|

Fig. 7: Input screen in the DBAG Member Section to create a new CRE user

1. Report User Information (Optional):
In the field "Description" a short description of the user should be given. Please note that the description is not the UserID. Any description of the user may be entered here.
The UserID field itself will be filled by the system automatically
2. Report Engine Configuration:
"Add Access" needs to be clicked on to enter the "MemberID", a "Market" and an "Environment". A selection of all applicable combinations for this specific user will be displayed from which he can choose.
Please note that one user can have access for multiple combinations of member IDs, markets and environments, but not more than 13 entries. For all market directories supported by the CRE (underlying markets), also the relevant associated markets are now available for selection as a mandatory element during the setup.

Examples of combinations for underlying markets:

| Market | Underlying Market |
|----------------------|-------------------|
| EEX Futures | EUREX |
| Eurex Repo | EUREX |
| Malta Stock Exchange | XETRA |

For a complete overview refer to Appendix C.

3. Network Data (Optional):

Access for a user can be restricted to a single IP address. An additional IP address will be added by clicking on "Add Row". This is optional, but highly recommended by DBAG. Select an IP address and click on "Remove Row" to remove it.

The address pattern entered here will be included in the configuration file for this user account. A wildcard (*) can be used in the pattern to represent zero or more characters. In order to combine multiple patterns, a pattern list can be used; each pattern must be on a new line. To prevent mistakes a logical check of the IP address is provided.

4. Certificate:

The certificate refers to the public key created as described in chapter 3.1. The certificate/public key is only used to authenticate a user/role. The user/role permissions (i.e. access to member/market/etc.) are assigned at a later stage in the setup process (please refer to step 2 in this chapter).

It is recommended to create a private/public key pair for every CRE user that may connect to the CRE.

A public key needs to be uploaded by clicking on "Add Certificate". Next a popup window will appear where the OpenSSH public key has to be uploaded. Browse to the location of the key and click "Upload".

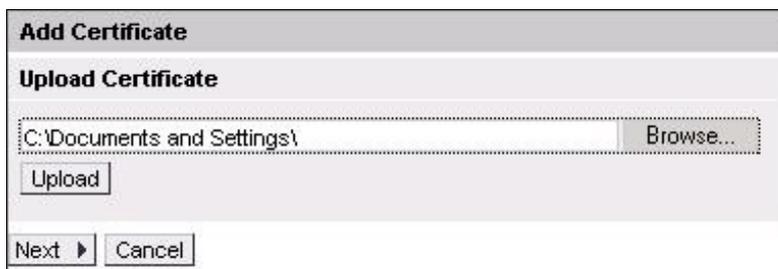


Fig. 8: Popup screen to upload the public key

The private key file must be accessible for the participant's SFTP client, but should never be sent to DBAG. Click "Next" to add validity dates and adding comments. A validity period of 90 days is used by default. The certificate/public key is added by clicking "Add Certificate".

Add Certificate

Certificate Info

Valid From: 2/14/2011

Always Valid:

Valid To: 5/15/2011

Comment:

◀ Back Add Certificate Cancel

Fig. 9: Screen to enter validity dates and comments for the certificate/public key

Key expiration:

CRE users will be notified by email in due time about upcoming expiration. Latest one day before a certificate/public key will expire, the existing key needs to be prolonged (upload the existing key once more and define a new expiration date) or a new private/public key pair must be generated and the newly generated public key needs to be uploaded.

5. The final step is to save the changes: Click on "Save" to automatically create the UserID

Report User Information

Description: GDBXX Simu

UserID: 1027709_000015

Report Engine Configuration

Add Access Remove Access

| MemberID | Environment | Market |
|--------------------------------|-------------|--------|
| <input type="checkbox"/> GDBXX | Simulation | EUREX |
| <input type="checkbox"/> SIMAN | Simulation | EUREX |

Network Data

Add Row Remove Row

IPAddress

Certificates

Add Certificate Remove Certificate

| Status | Valid From [dd.mm.yyyy] | Valid To [dd.mm.yyyy] | Comment |
|-------------------------------------|-------------------------|-----------------------|---------|
| <input checked="" type="checkbox"/> | 03.01.2012 | 31.12.9999 | |

Certificate Data:

Fig. 10: Exemplary CRE user information after the successful creation of a CRE user

The generated UserID is displayed in the Report Engine User Overview table, as well as in the field UserID when selecting a user in the table on the main screen.

All Central Coordinators and their deputies are informed via e-mail whenever a new CRE user has been successfully setup, modified or deleted.

Due to technical restrictions and introduction of public area, please do not add more than 13 environments per UserID!

When initially creating a CRE user, the information will be available after two business days. All subsequent changes to a CRE user become active after the next business day.

4 Connecting to the CRE

Participants may use an SFTP client of their choice to access the CRE server and download their reports. The CRE does not offer any interactive SSH sessions nor any kind of browser access. The following information is required to log into the CRE:

- UserID which has been generated by successfully setting up a new user in the DBAG member section
- The IP address (host name) of DBAG/CRE
- The private ssh key fitting to the public key uploaded in the DBAG member section

The CRE is divided into areas.

Area A gives access to reports of the following markets and services:

- T7 cash markets including Xetra (XETR) and partner exchanges
- T7 derivatives markets including Eurex trading, T7/FX and EEX Futures
- Eurex Clearing's C7
- Eurex Clearing's PRISMA
- EurexOTC Clear
- CCP
- Xetra Release 17.0 participants (XFRA)

Area B gives access to reports of the following markets and services:

- Regulatory Hub
- Eurex Repo

The IP's used for access to the CRE are shown in the table below.

| | CRE infrastructure IP addresses | | | Port | |
|--------|---------------------------------|--------------|---------------|--------|---------|
| | Leased line | | Internet | Public | Private |
| | A | B | | | |
| Area A | 193.29.90.67 | 193.29.90.99 | 193.29.90.132 | 2221 | 2222 |
| Area B | | | | 2231 | 2232 |

In the Appendix of this document, you can find all server host keys for the CRE.

If you are using a client to connect to the CRE, the client will ask you once to accept the DBAG CRE Server Host Key, the Server Host Key will be remembered for future logins by the client. If you use a customized script to access the CRE, the Server Host Key has to be integrated where appropriate. The DBAG Server Host Key for the CRE can be found in the Appendix of this document.

Connectivity to the CRE can be tested via Telnet.

- Test the connection using Telnet

```
# telnet 193.29.90.65 2222
Trying 193.29.90.65...
Connected to 193.29.90.65.
Escape character is '^]'.
SSH-2.0-OpenSSH_5.3

Protocol mismatch.
Connection to 193.29.90.65 closed by foreign host.
# telnet 193.29.90.97 2222
Trying 193.29.90.97...
Connected to 193.29.90.97.
Escape character is '^]'.
SSH-2.0-OpenSSH_5.3

Protocol mismatch.
Connection to 193.29.90.97 closed by foreign host.
#
```

Fig. 11: Test of CRE using telnet

4.1 MS Windows example using WinSCP

WinSCP is an open source free SFTP client, SCP client, FTPS client and FTP client for MS Windows. Its main function is file transfer between a local and a remote computer. Beyond this, WinSCP offers scripting and basic file manager functionality.

Source: <http://winscp.net/eng/index.php>

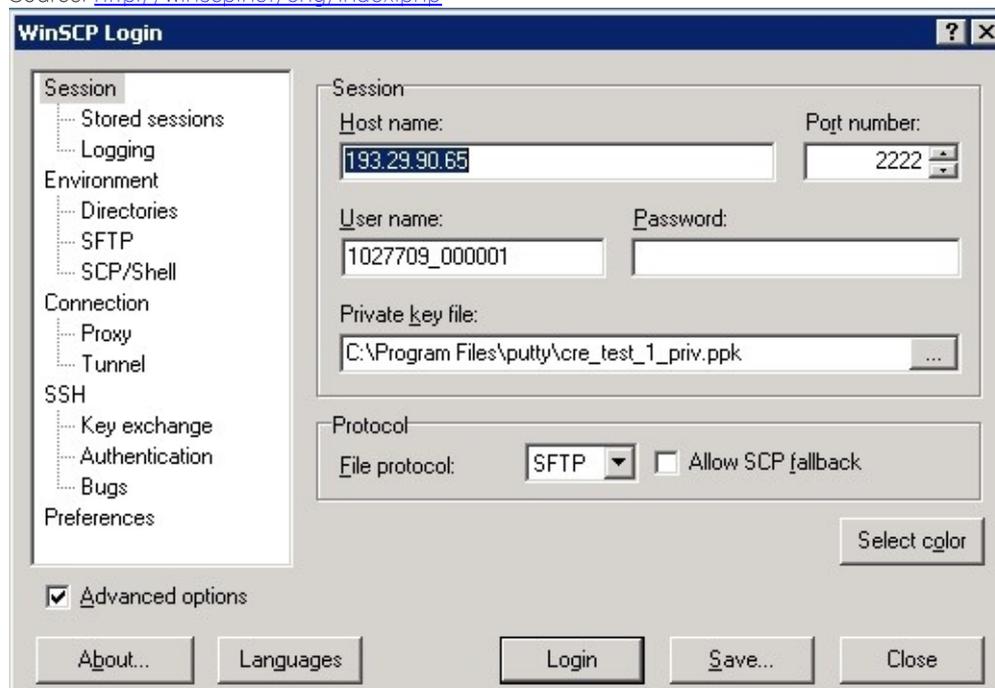


Fig. 12: Input screen required in order to log in to the CRE

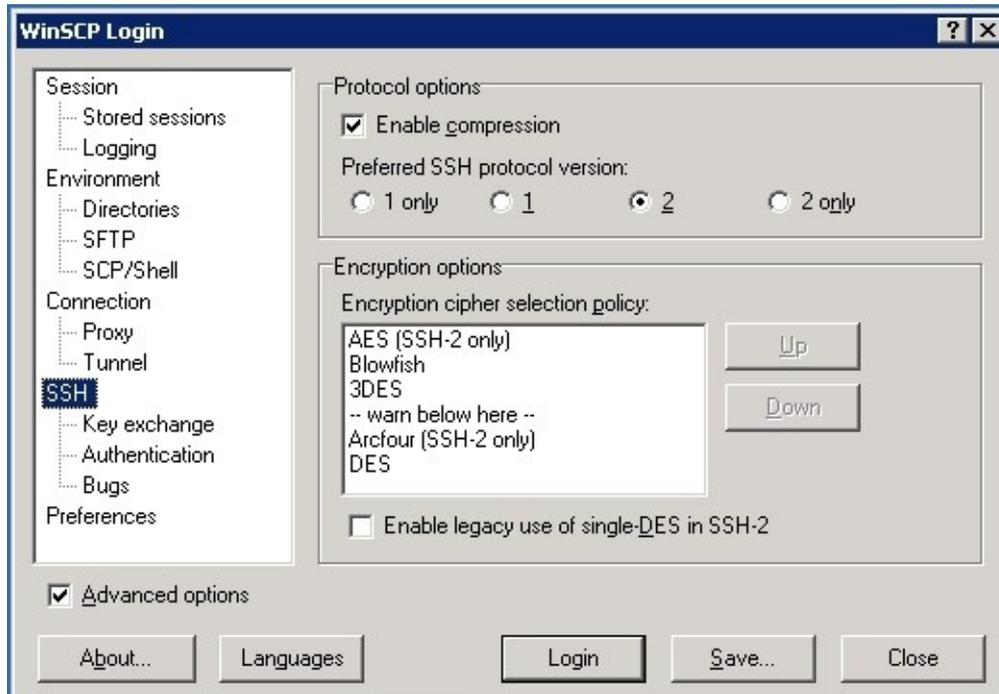


Fig. 13: Enable compression for ssh transfer.

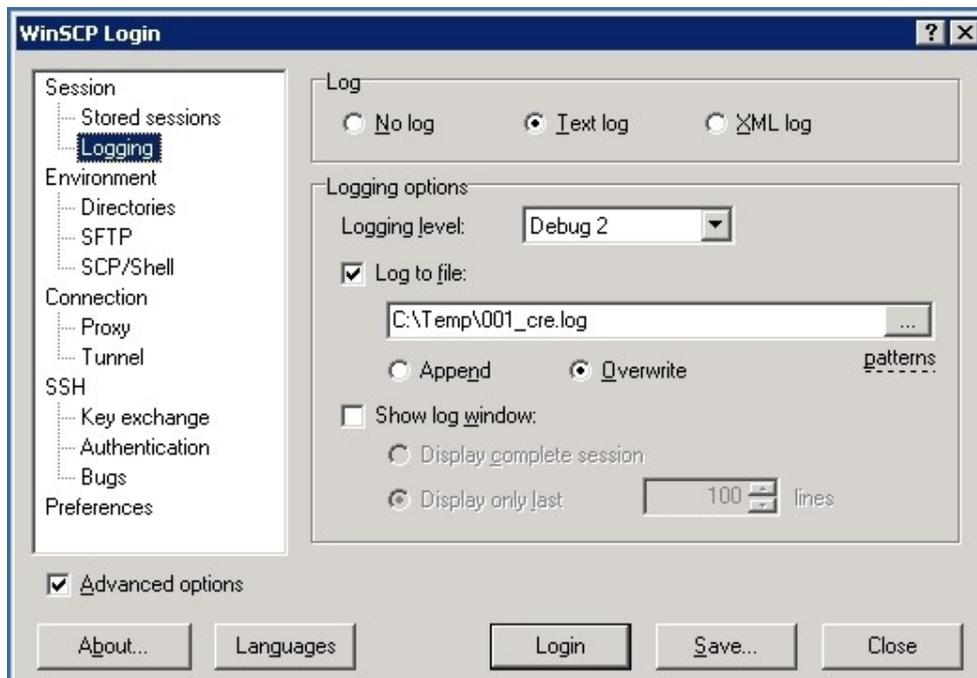


Fig. 14: Enable logging for WinSCP.

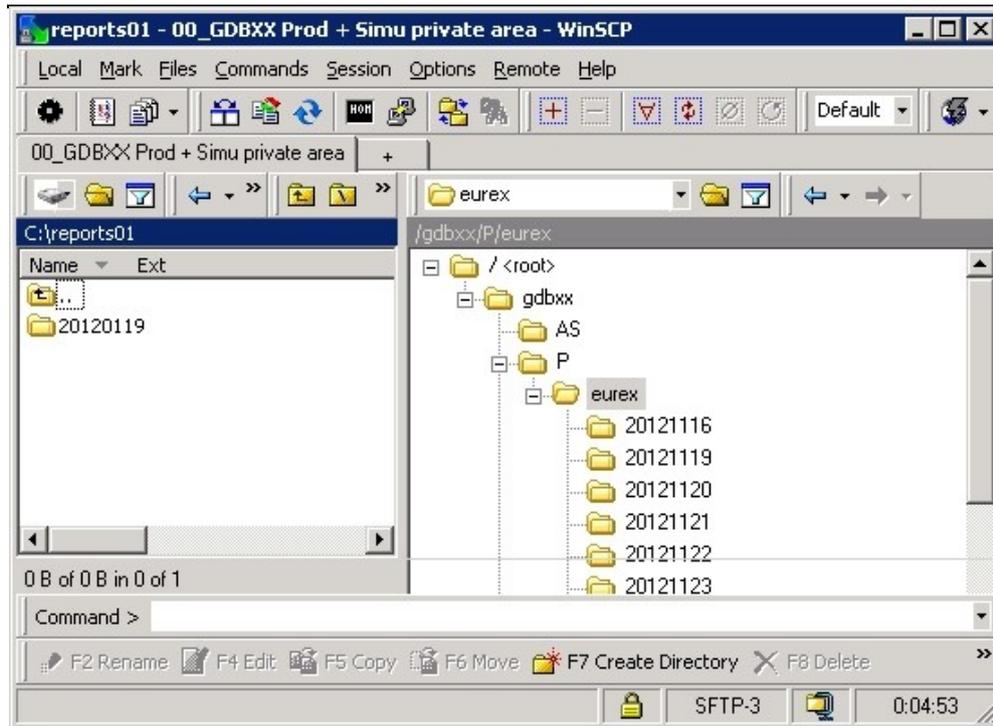


Fig. 15: Successful login to CRE member section with WinSCP.

After a successful login participant can use the full range of functionality of the CRE.

4.2 MS Windows example using PSFTP

PSFTP belongs to PuTTY tools mentioned above. It provides command line SFTP client that uses PuTTY key format. It offers script capabilities as well.

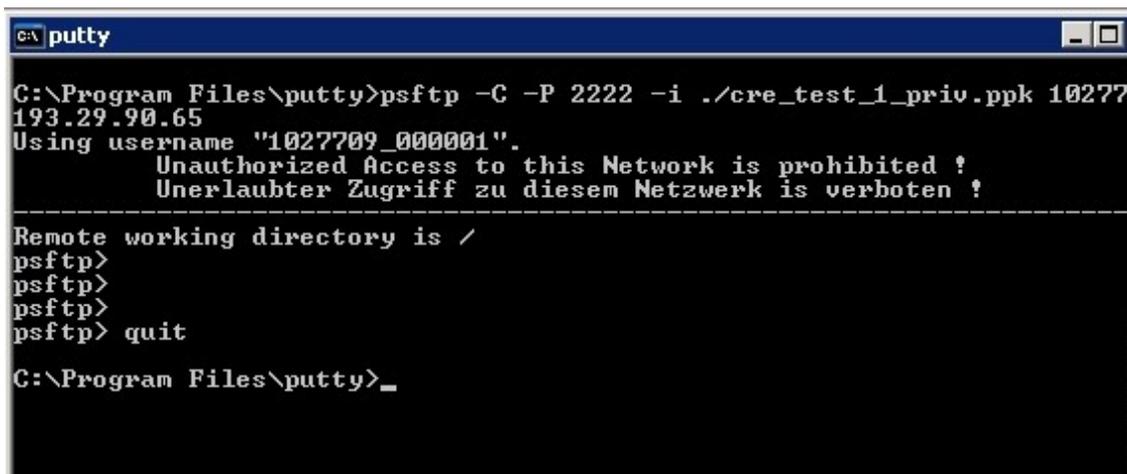


Fig. 16: Successful login to CRE member section with PSFTP.

4.3 Troubleshooting and Debugging examples

If you have trouble connecting to the CRE contact your TKAM. It is necessary to have detailed information about what happened exactly, what the problem is including error messages and screenshots.

WinSCP has the ability to log its activities, see Figure 17 above how to configure and utilize that feature.

SFTP provides a debug switch (`-vvv`, see SSH manual page for details) which prints a detailed connection log into the standard output channel.

See the two most common errors as examples below.

4.3.1 Error 1: No matching SSH key found

```
$ sftp -oPort=2222 -vvv 1027709@193.29.90.65

Connecting to 193.29.90.65...
OpenSSH_4.3p2, OpenSSL 0.9.8e-fips-rhel5 01 Jul 2008
debug1: Reading configuration data /root/.ssh/config
debug1: Reading configuration data /etc/ssh/ssh_config
debug1: Applying options for *
debug2: ssh_connect: needpriv 0
<--- SNIP --->
debug3: preferred gssapi-with-mic,publickey,keyboard-
interactive,password
debug3: authmethod_lookup publickey
debug3: remaining preferred: keyboard-interactive,password
debug3: authmethod_is_enabled publickey
debug1: Next authentication method: publickey
debug1: Offering public key: first_name last_name (2010-10-11)
debug3: send_pubkey_test
debug2: we sent a publickey packet, wait for reply
debug1: Authentications that can continue: publickey
debug1: Offering public key: rsa-key-20110217
debug3: send_pubkey_test
debug2: we sent a publickey packet, wait for reply
debug1: Authentications that can continue: publickey
debug1: Offering public key: rsa-key-20101207
debug3: send_pubkey_test
debug2: we sent a publickey packet, wait for reply
Received disconnect from 193.29.90.65: Too many authentication
failures for 1027709_000001
Couldn't read packet: Connection reset by peer
```

4.3.2 Error 2: No key used at all

```
$ sftp -oPort=2222 -vvv 1027709\_000001@193.29.90.65

Connecting to 193.29.90.65...
OpenSSH_4.3p2, OpenSSL 0.9.8e-fips-rhel5 01 Jul 2008
debug1: Reading configuration data /root/.ssh/config
debug1: Reading configuration data /etc/ssh/ssh_config
debug1: Applying options for *
debug2: ssh_connect: needpriv 0

<--- SNIP --->

debug1: Authentications that can continue: publickey
debug3: start over, passed a different list publickey
debug3: preferred gssapi-with-mic,publickey,keyboard-
interactive,password
debug3: authmethod_lookup publickey
debug3: remaining preferred: keyboard-interactive,password
debug3: authmethod_is_enabled publickey
debug1: Next authentication method: publickey
debug1: Offering public key: /root/.ssh/kdump_id_rsa
debug3: send_pubkey_test
debug2: we sent a publickey packet, wait for reply
debug1: Authentications that can continue: publickey
debug1: Trying private key: /root/.ssh/id_rsa
debug3: no such identity: /root/.ssh/id_rsa
debug1: Trying private key: /root/.ssh/id_dsa
debug3: no such identity: /root/.ssh/id_dsa
debug2: we did not send a packet, disable method
debug1: No more authentication methods to try.
Permission denied (publickey).
Couldn't read packet: Connection reset by peer
```

The complete command line switch overview may be found in the SFTP manual page.

Be aware that no interactive session is possible (SCP), only SFTP service is supported.

For troubleshooting with DBAG Group Client Services & Administration please be able to provide the above mentioned log/debug information via email and/or DBAG member section

4.4 Retrieving reports and files

Participants may use the SFTP client of their choice to access the CRE's server. After successful login, participants will be able to access their reports and files either manually, i.e. by browsing through their folder(s) on the server, or by downloading them automatically via script.

In case a connection to the CRE is not possible or an existing connectivity got broken please do not try to login again in very short time intervals (i.e. several tries every few seconds) but rather wait a little while (a minute or more) and then try again. If you tried this for a few times and still no connection can be established, please contact DBAG Technical Support.

4.5 Automated Download: Sample script

In order to provide an indication of the level of effort to be put into the programming of a script, a sample script for the widely used Bourne-again shell (bash) is provided below:

```
#!/bin/bash

if [ $# -ne 6 ]; then
    echo
    echo "Usage:"
    echo "`basename $0 ` <ssh key file> <sftp user> <CRE node>
    <member id> <environment> <market>"
    echo
    exit 15
fi

keyfile=$1
user=$2
node=$3
member_id=`echo -n $4 |tr -s [:upper:] [:lower:]`
env=`echo -n $5 |tr -s [:lower:] [:upper:]`
market=`echo -n $6 |tr -s [:upper:] [:lower:]`
sftp=/usr/bin/sftp
echo=""
date=`date +%Y%m%d`
echo "
    cd $member_id/$env/$market
    get "$date"*
    exit " | $sftp -C -i $keyfile -b - $user@$node
```

Please keep in mind that this script has been kept simple and universal. It may need customization to meet individual requirements.

Since this is an example for an operating system running a bash shell, please note the WinSCP is also capable of scripting and automated job processing on MS Windows.

5 Structures and naming conventions

5.1 Directory structure in the CRE participant area

After a successful login, the user is placed to the chrooted file system root (/) - the home directory. A user will not be able to access any files outside his home directory and sub-directories. A business partner home directory may look like the sample below (user view).

| Example 1 | Example 2 |
|---|---|
| <pre> / +---abcex +---P +---eurex +---date +---S +---eurex +---date +---abcfr +---AS +---P +---eurex +---date +---S +---ccp +---date +---eurex +---date +---xetra +---date </pre> | <pre> ----pakfr +---AS +---P +---xetra +---date +---xetra_ffm2 +---date +---S +---xetra +---date +---xetra_ffm2 +---date </pre> |

Examples of directory structure in member area.

The first level of directories is corresponding to the respective MemberID configured, followed by the environment (second directory level) and the market and date, where:

- AS=Advanced Simulation (Available only for Xetra Frankfurt)
- P=Production
- S=Simulation

In example 1, member ABCEX has been configured for the Eurex production and simulation, and ABCFR has simulation environments for Eurex and Xetra and CCP and the production environment for Eurex.

In example 2, member PAKFR has been configured for the Xetra and Xetra Frankfurt 2 production environment and for the Xetra and Xetra Frankfurt 2 simulation environment.

Please note that neither the directory structure nor access permissions can be manipulated by Deutsche Börse or the individual user. Access to member IDs, environments and markets is solely configured by the participant's Central Coordinator/ Technical User Administrator in the DBAG Member Section and "translated" into permissions for directories on the CRE.

Since CRE users will be restricted to read-only access to the CRE file system, file and directory operations will be limited to commands like cd, get, help, ls, pwd, etc. Any operation on directories or files within the file system that may incorporate or require manipulations to the file system content will not be permitted.

5.2 Directory structure in the CRE public area

In the public area, non-transactional and non-participant specific reports and files will be published. Therefore, a virtual participant directory "publi" is provided on the CRE. Participants can browse the virtual participant directory "publi" using the same authorisation mechanisms to access non-transactional and non-participant-specific reports and files. To access the public Area A, participants must use port 2221 instead of port 2222. To access the public Area B, participants must use port 2231 instead of port 2232.

Example 3

```
+---publi
  +---AS
  +---P
    | +---ccp
    | +---eurex
    | +---xetra
    | +---xetra_ffm2
  +---S
    +---ccp
    +---eurex
    | +---20120814
    | +---20120823
    +---xetra
    +---xetra_ffm2
```

Examples of directory structure in public area.

For the CRE public section, the same directory structure is applicable as for the CRE member area. Please refer to chapter 5.1 for further details about the directory structure.

6 Report and file naming conventions

The CRE has the following REGEX (regular expression) pattern as naming conventions:

```
uncompressed reports or files:
[0-9]{2}[0-9A-Z]{8}[0-9A-Z]{5}[0-9]{8}[A-Z0-9\_\-]{0,34}\.[A-Z]{3}

compressed reports or files:
[0-9]{2}[0-9A-Z]{8}[0-9A-Z]{5}[0-9]{8}[A-Z0-9\_\-]{0,34}\.[A-Z]{3}
\.ZIP
```

Maximum length of a report file name is 64 characters!

The naming conventions in the CRE public area are the same as in the CRE member area, whereas all reports and files in the CRE public area will use the member ID PUBLI.

Versioning

In case a report or file needs to be corrected (due to inconsistencies, incompleteness or corrupted data) the original zip file name will be modified. A versioning indicator will be added with a convention of -V[0-9]{2}, starting with -V01 and maximum versions of -V99.

Please note: Report names will always be static. Delivery of a new version of a given report can only be observed with the help of the versioning indicator added to the name of the corresponding zip file.

Example for an uncompressed report or file:

Original file/report: 01RPTTC540PAKFR20120301GDBXX.TXT

Examples for compressed reports or files:

Original version: 01RPTTC540PAKFR20120301GDBXX.TXT.ZIP

1st correction: 01RPTTC540PAKFR20120301GDBXX-V01.TXT.ZIP

2nd correction: 01RPTTC540PAKFR20120301GDBXX-V02.TXT.ZIP

[...]

Please note that the versioning indicator additionally applies to all report and file naming conventions for zip containers below.

6.1 General report naming conventions

| Field | Meaning | Remark |
|--------------------|-----------------|--------------------|
| [0-9]{2} | Environment ID | i.e. 00 Eurex Prod |
| [0-9A-Z]{8} | Report name | i.e. RPTTC540 |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR |
| [0-9]{8} | Business date | YYYYMMDD |
| [A-Z0-9_\-]{0,34} | Flexindicator 1 | Optional |
| | Flexindicator 2 | Optional |
| | Timestamp | Optional |
| | Sequence number | Optional |

| | | |
|---------------|----------------------------------|---|
| | ... | Optional |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP, PDF.ZIP |

Depending on the market the optional Flexindicator 1 and 2 have various meanings. Flexindicator 1 and 2, timestamp, sequence number and possible future enhancements are optional. Depending on the type of report they may remain empty. Maximum length for all options is 36 characters in summary.

Compression:

Reports and Files are provided in a compressed format. Compressed reports and files can be identified by the respective suffix. Depending on the market, the suffixes comprise:

| Description | Suffix | Example |
|-----------------------------------|--------|---|
| ZIP Format | (.ZIP) | (FILRDF for Eurex) |
| Compressed CSV format (.CSV.ZIP) | | (51FTXEONLNGDBXX20121201XETR for Xetra) |
| Compressed text format (.TXT.ZIP) | | (CB001 for Eurex) |
| Compressed XML format (.XML.ZIP) | | (CB001 for Eurex) |

6.1.1 Eurex report naming conventions

| Field | Meaning | Remark |
|-------------|-----------------|--|
| [0-9]{2} | Environment ID | 00, 90 Prod, 01, 95 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTTC540 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9A-Z]{5} | Flexindicator 1 | Only for 00 and 01: Eurex Clearing Member Id 5 alphanumerics |
| [A-Z]{4} | Flexindicator 2 | intraday/end of day identifier 4 chars |

| | | |
|---------------|----------------------------------|--|
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP, PDF.ZIP |

Example Eurex report: 01RPTTC540GDBXX20120301PAKFR.TXT.ZIP
Example Eurex intraday report: 01RPTCP005GDBXX20140211PAKFRINTR.TXT.ZIP

6.1.2 EurexOTC Clear and Eurex Risk Operation report naming conventions

| Field | Meaning | Remark |
|-------------|----------------------------------|---|
| [0-9]{2} | Environment ID | OTC Clear: 84 EurexOTC Prod, 85 EurexOTC Simu Risk Operation: 00 Prod, 01 Simu All: 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTCB202 8 alphanumeric |
| [0-9A-Z]{5} | Member ID | i.e. GDBXX 5 alphanumeric |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9]{6} | Flexindicator 1 | Time HHMMSS, used only for intraday reports 6 numerics |
| [0-9]{0,10} | Flexindicator 2 | unique identifier (trade id) 10 numerics |
| \. | Dot | |
| [A-Z]{3} | Extension for compressed reports | TXT.ZIP, CSV.ZIP, XML.ZIP |

Example EurexOTC end-of-day Production report:

84RPTCB202GDBXX20121113.XML.ZIP

Example EurexOTC intraday Production report:

84RPTCI200GDBXX201609301447490000360469.XML.ZIP

Example Eurex Risk Operations intraday report:

00RPTCI042GDBXX20121113123456.XML.ZIP

6.1.3 CCP report naming conventions

| Field | Meaning | Remark |
|---------------|----------------------------------|--|
| [0-9]{2} | Environment ID | 20 Prod, 21 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTCE270 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9]{2} | Flexindicator 1 | settlement/continuous run number 2 numerics |
| [0-9A-Z]{5} | Flexindicator 2 | CCP reporting run type 5 alphanumerics |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example CCP report: 21RPTCE270PAKFR2012030104CORPT.XML.ZIP

6.1.4 Xetra report naming conventions

| Field | Meaning | Remark |
|---------------|----------------------------------|---|
| [0-9]{2} | Environment ID | Xetra T7 51 Prod, 52 Simu, FFM2 61 Prod, 62 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTTC810 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [A-Z]{4} | Flexindicator 1 | MIC Code 4 chars |
| [A-Z0-9]{2} | Flexindicator 2 | T7 Indicator |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example Xetra report:

51RPTTC810PAKFR20120301XETR.XML.ZIP

Example Xetra T7 report:

51RPTTC810PAKFR20120301XETR**T7**.XML.ZIP

| Current list of valid Xetra MIC codes: | | Current list of valid Xetra MIC codes for Xetra T7: | |
|--|----------------------|---|-----------------|
| XFRA | Xetra Frankfurt 2 | XETR | Xetra Frankfurt |
| XCAY | Xetra Cayman Islands | Xetra Malta | XMAL |
| XBUL | Xetra Bulgaria | | |

6.1.5 Regulatory Reporting Hub report naming conventions

| Field | Meaning | Remark |
|---------------|----------------------------------|----------------------------------|
| [0-9]{2} | Environment ID | 10 Prod, 16 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTTRXnn 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. GDBRH 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| n.a. | Flexindicator 1 | n.a. |
| [A-Z]{4} | Flexindicator 2 | n.a. |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP |

Example Regulatory Reporting Hub report: 10RPTTRX04GDBRH20161214.CSV.ZIP
 For X equals: D = daily / W = weekly / M = monthly / Q = quarterly / Y = yearly
 Please Note: Regulatory Reporting Hub zipped report-files may contain more than one report!

6.1.6 Eurex Repo report naming conventions

| Field | Meaning | Remark |
|-------|---------|--------|
|-------|---------|--------|

| | | |
|---------------|----------------------------------|---|
| [0-9]{2} | Environment ID | 14 Prod., 15 Simu., 19 Advanced Simu. 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. RPTMTX01 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9]{2} | Counter | 01 2 numeric |
| [0-9 A-Z]{8} | Extract Name | The extract name provided by the member, filled with trailing zeros to the 7th character. 8th character is "S" for scheduled extract or "N" for Run Now. |
| [0-9 A-Z]{5} | Segment | e.g. GCP00 5 alphanumerics |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed reports | CSV.ZIP, XLS.ZIP |

6.2 General file naming conventions

Files, such as theoretical price files in Eurex or instrument reference data files are called nontransactional reports. The naming conventions for nontransactional reports are slightly different from report naming conventions.

6.2.1 Eurex file naming conventions

| Field | Meaning | Remark |
|---------------|--------------------------------|---|
| [0-9]{2} | Environment ID | 00, 90 Prod, 01, 95 Simu 2 numerics |
| [0-9A-Z]{8} | Filename | i.e. FPICPARA 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [A-Z]{4} | Flexindicator 1 | intraday/end of day identifier 4 chars |
| n.a. | Flexindicator 2 | n.a. |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed files | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example:

Eurex intraday theoretical price file: 01FPICPARAPAKFR20120301INTR.TXT.ZIP

Eurex end-of-day theoretical price file: 01FPICPARAPAKFR20120301.TXT.ZIP

6.2.2 CCP file naming conventions

| Field | Meaning | Remark |
|---------------|--------------------------------|------------------------------------|
| [0-9]{2} | Environment ID | 20 Prod, 21 Simu 2 numerics |
| [0-9A-Z]{8} | Filename | i.e. FPICTHEC 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| n.a. | Flexindicator 1 | n.a. |
| n.a. | Flexindicator 2 | n.a. |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed files | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example CCP theoretical price file: 21FPICTHECPAKFR20120301.TXT.ZIP

6.2.3 Xetra Release 17.0 file naming conventions

| Field | Meaning | Remark |
|---------------|--------------------------------|---|
| [0-9]{2} | Environment ID | 51 Prod, 52 Simu, 53 Advanced Simu XFRA 61 Prod, 62 Simu 2 numerics |
| [0-9A-Z]{8} | Filename | i.e. FTXEONLN 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| n.a. | Flexindicator 1 | n.a. |
| [A-Z]{4} | Flexindicator 2 | MIC Code 4 alphanumerics |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed files | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example Xetra instrument reference data file: 52FTXEONLNPAKFR20120301XETR.CSV.ZIP
Please see Appendix B for an overview about naming conventions for all Xetra 17.0 instrument reference data files.

6.2.4 Eurex Clearing Prisma file naming conventions for participant specific files

| Field | Meaning | Remark |
|--------------------|--|--|
| [0-9]{2} | Environment ID | 00 Prod, 01 Simu 2 numerics |
| [0-9A-Z]{8} | File name | i.e. FILTHEOI 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9A-Z_\-]{0,34} | Flexindicator 1 Flexindicator 2 | <clgmember_id> <version> <tech_split_ident> - <max_split_tech> |
| \. | Dot | |
| [A-Z]{3}\.ZIP | Extension for compressed files | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Example:

Open interest theoretical price files:

00FILTHEOICBKFRYYYYMMDDCBKFREUXCINTR01_01.TXT.ZIP (Intraday)

00FILTHEOICBKFRYYYYMMDDCBKFREUXCEODX01_01.TXT.ZIP (End of day)

6.2.5 Eurex T7 Reference Data File (RDF) naming conventions in public area

| Field | Meaning | Remark |
|---------------|--------------------------------|---|
| [0-9]{2} | Environment ID | 00, 90 Prod, 01, 95 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. FILRDF01 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PUBLI 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [A-Z]{4} | Flexindicator 1 | MIC Code 4 chars |
| [A-Z]{4} | Flexindicator 2 | n.a. |
| [0-9A-Z]{5} | Timestamp | UTC second of the year when the initial file (sequence number 000) was created, base36 encoded 5 alphanumerics |
| [0-9]{3} | Sequence number | 000 – 999 3 numerics |
| \. | Dot | |
| [A-Z]{3}\.ZIP | extension for compressed files | XML.ZIP |

Example Eurex RDF: 00FILRDF01PUBLI20120903XEURITS00999.XML.ZIP
 Example EEX RDF: 00FILRDF01PUBLI20120903XEEEITS00999.XML.ZIP

6.2.6 Xetra T7 Reference Data File (RDF) naming conventions in public area

| Field | Meaning | Remark |
|---------------|--------------------------------|--|
| [0-9]{2} | Environment ID | 51,55 Prod, 52,Simu 2 numerics |
| [0-9A-Z]{8} | Report name and ID | i.e. FILRDF01(dynamic) FILRDF02 (static) 8 alphanumeric |
| [0-9A-Z]{5} | Member ID | i.e. PUBLI 5 alphanumeric |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [A-Z]{4} | Flexindicator 1 | MIC Code 4 chars |
| [A-Z]{4} | Flexindicator 2 | n.a. |
| [0-9A-Z]{5} | Timestamp | UTC second of the year when the initial file (sequence number 000) was created, base36 encoded 5 alphanumeric |
| [0-9]{3} | Sequence number | 000 |
| \. | Dot | |
| [A-Z]{3}\.ZIP | extension for compressed files | XML.ZIP |

Example Xetra T7 RDF:

| FILRDF01 | FILRDF02 |
|---|---------------------------------|
| 51FILRDF01PUBLI20131218XETR3OSKW000.XML | 51FILRDF02PUBLI20131218XETR.ZIP |

Current list of valid Xetra MIC codes:
XETR Xetra Frankfurt

6.2.7 Eurex Clearing Prisma file naming conventions in public area

| Field | Meaning | Remark |
|---------------------|--|---|
| [0-9]{2} | Environment ID | 00 Prod, 01 Simu 2 numerics |
| [0-9A-Z]{8} | Report name | i.e. FILTHEOI 8 alphanumerics |
| [0-9A-Z]{5} | Member ID | i.e. PAKFR 5 alphanumerics |
| [0-9]{8} | Business date | YYYYMMDD 8 numerics |
| [0-9A-Z_-\-]{0,34} | Flexindicator 1 Flexindicator 2 | <file_type> <version> <tech_split_ident> - <max_split_tech> |
| [A-Z]{3}\.ZIP | Extension for compressed files | CSV.ZIP, LIS.ZIP, TXT.ZIP, XML.ZIP |

Examples:

Open interest theoretical price file:

00FILTHEOIPUBLI20170807EUXCOIEODX01_01.TXT.ZIP

00FILTHEOIPUBLI20170807EUXCOIINTR01_01.TXT.ZIP

Non open interest theoretical price file:

00FILTHEOIPUBLI20170807EUXCNIEODX01_04.TXT.ZIP

00FILTHEOIPUBLI20170807EUXCNIINTR01_04.TXT.ZIP

Other files (End of day, no technical split needed):

00FILFOREXPUBLI20170807EUXCEODX.TXT.ZIP

00FILRIMECPUBLI20170807EUXCEODX.TXT.ZIP

6.3 Corrupted reports and files

A report or file not following the naming conventions might be corrupt. Occurrence of such reports should be reported to Deutsche Börse AG Group Client Key Account Management

Example for a corrupted report: 01RPTTA111PAKFR20120301GDBXX.TXT.ZIP_INC

6.4 Report availability

Scripts fetching reports automatically from the servers should be configured accordingly in a given time frame (please see website <http://deutsche-boerse.com/dbg-en/about-us/services/service-status>)

The CRE servers will run 24/7 with the following exceptions: A few downtimes per year for general hardware maintenance, typically during Saturdays/Sundays. Nevertheless, permanent session log in is not supported. We will run regular member database software maintenance Monday to Friday at about 3.45 am and 2.15 pm (key importing) and at about 5.15 am (member enrolment). If necessary, additional software maintenance runs will take place especially on weekends. After each maintenance run a new login needs to be performed.

Deutsche Börse reserves the right to introduce technical limitations on the amount of requests allowed per timeframe and business partner, if necessary. It is recommended to keep an interval of at least 1 or 2 minutes between individual connection attempts to the CRE.

6.5 Historical reports: Restore directory

A new 'restore' directory can be created on the business day directory level of the member area. This directory is created and populated if participants manually order the retransmission of historical files and reports that are no longer available on the CRE.

As usual ordering of historical reports needs to be arranged with the help of cts@deutsche-boerse.com

It will also be created and populated with reports or files that outdate the history-keeping period. An existing 'restore' directory will also be available for a minimum of 10 business days.

We recommend to download and save the reports since it is a paid service to restore reports older than 10 business days.

6.6 Streamlined EOL encoding

All reports and files available on the CRE will use a carriage return line feed character <CRLF> as line separator. This is different to current reports available on MISS servers.

7 Appendix A

See examples of log file / output of successful connections to the CRE below.

7.1 Example of successful WinSCP connection log file

```
Debug level 1 is set:

. 2012-08-01 13:27:08.342 -----
-----
. 2012-08-01 13:27:08.342 WinSCP Version 4.3.2 (Build 1201) (OS 5.2.3790
Service Pack 2)
. 2012-08-01 13:27:08.342 Login time: Wednesday, August 01, 2012 1:27:08 PM
. 2012-08-01 13:27:08.342 -----
-----
. 2012-08-01 13:27:08.342 Session name: 1027709\_000001@193.29.90.65
. 2012-08-01 13:27:08.342 Host name: 193.29.90.65 (Port: 2222)
. 2012-08-01 13:27:08.342 User name: 1027709_000001 (Password: No, Key
file: Yes)
. 2012-08-01 13:27:08.342 Tunnel: No
. 2012-08-01 13:27:08.342 Transfer Protocol: SFTP
. 2012-08-01 13:27:08.342 Ping type: -, Ping interval: 30 sec; Timeout: 15
sec
. 2012-08-01 13:27:08.342 Proxy: none
. 2012-08-01 13:27:08.342 SSH protocol version: 2; Compression: Yes
. 2012-08-01 13:27:08.342 Bypass authentication: No
. 2012-08-01 13:27:08.342 Try agent: Yes; Agent forwarding: No;
TIS/CryptoCard: No; KI: Yes; GSSAPI: No
. 2012-08-01 13:27:08.342 Ciphers: aes,blowfish,3des,WARN,arcfour,des;
Ssh2DES: No
. 2012-08-01 13:27:08.342 SSH Bugs: -, -, -, -, -, -, -, -, -
. 2012-08-01 13:27:08.342 SFTP Bugs: -, -
. 2012-08-01 13:27:08.342 Return code variable: Autodetect; Lookup user
groups: Yes
. 2012-08-01 13:27:08.342 Shell: default
. 2012-08-01 13:27:08.342 EOL: 0, UTF: 2
. 2012-08-01 13:27:08.342 Clear aliases: Yes, Unset nat.vars: Yes, Resolve
symlinks: Yes
. 2012-08-01 13:27:08.342 LS: ls -la, Ign LS warn: Yes, Scpl Comp: No
. 2012-08-01 13:27:08.342 Local directory: default, Remote directory: home,
Update: No, Cache: Yes
. 2012-08-01 13:27:08.342 Cache directory changes: Yes, Permanent: Yes
. 2012-08-01 13:27:08.342 DST mode: 1
. 2012-08-01 13:27:08.342 -----
-----
. 2012-08-01 13:27:08.358 Looking up host "193.29.90.65"
. 2012-08-01 13:27:08.358 Connecting to 193.29.90.65 port 2222
```

```
. 2012-08-01 13:27:08.358 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:08.358 Detected network event
. 2012-08-01 13:27:08.373 Detected network event
. 2012-08-01 13:27:08.373 Server version: SSH-2.0-OpenSSH_5.3
. 2012-08-01 13:27:08.373 We believe remote version has SSH-2 ignore bug
. 2012-08-01 13:27:08.373 Using SSH protocol version 2
. 2012-08-01 13:27:08.373 We claim version: SSH-2.0-WinSCP_release_4.3.2
. 2012-08-01 13:27:08.373 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:08.373 Detected network event
. 2012-08-01 13:27:08.373 Doing Diffie-Hellman group exchange
. 2012-08-01 13:27:08.373 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:08.420 Detected network event
. 2012-08-01 13:27:08.420 Doing Diffie-Hellman key exchange with hash SHA-1
. 2012-08-01 13:27:08.639 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:08.639 Detected network event
. 2012-08-01 13:27:08.967 Host key fingerprint is:
. 2012-08-01 13:27:08.967 ssh-rsa 2048
3b:c0:a4:8d:a2:a0:f7:2b:a1:2e:0c:b7:f4:02:9d:c7
. 2012-08-01 13:27:08.967 Initialised AES-256 SDCTR client->server
encryption
. 2012-08-01 13:27:08.967 Initialised HMAC-SHA2 client->server MAC
algorithm
. 2012-08-01 13:27:08.967 Initialised AES-256 SDCTR server->client
encryption
. 2012-08-01 13:27:08.967 Initialised HMAC-SHA2 server->client MAC
algorithm
. 2012-08-01 13:27:08.967 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:09.014 Detected network event
. 2012-08-01 13:27:09.014 Reading private key file "C:\Program
Files\putty\cre_test_1_priv.ppk"
! 2012-08-01 13:27:09.014 Using username "1027709_000001".
. 2012-08-01 13:27:09.014 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:09.076 Detected network event
. 2012-08-01 13:27:09.092 Offered public key
. 2012-08-01 13:27:09.092 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:09.092 Detected network event
. 2012-08-01 13:27:09.092 Offer of public key accepted
! 2012-08-01 13:27:09.092 Authenticating with public key "rsa-key-20110318"
. 2012-08-01 13:27:09.514 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:09.670 Detected network event
```

```
. 2012-08-01 13:27:09.670 Access granted
. 2012-08-01 13:27:09.670 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:09.873 Detected network event
. 2012-08-01 13:27:09.873 Opened channel for session
. 2012-08-01 13:27:09.873 Waiting for the server to continue with the
initialisation
. 2012-08-01 13:27:10.076 Detected network event
. 2012-08-01 13:27:10.076 Started a shell/command
. 2012-08-01 13:27:10.076 -----
-----

. 2012-08-01 13:27:10.076 Using SFTP protocol.
. 2012-08-01 13:27:10.076 Doing startup conversation with host.
> 2012-08-01 13:27:10.076 Type: SSH_FXP_INIT, Size: 5, Number: -1
. 2012-08-01 13:27:10.076 Sent 9 bytes
. 2012-08-01 13:27:10.076 There are 0 bytes remaining in the send buffer
. 2012-08-01 13:27:10.076 Waiting for another 4 bytes
. 2012-08-01 13:27:10.076 Detected network event
. 2012-08-01 13:27:10.076 Received 99 bytes (0)
. 2012-08-01 13:27:10.076 Read 4 bytes (95 pending)
. 2012-08-01 13:27:10.076 Read 95 bytes (0 pending)
< 2012-08-01 13:27:10.076 Type: SSH_FXP_VERSION, Size: 95, Number: -1
. 2012-08-01 13:27:10.076 SFTP version 3 negotiated.
. 2012-08-01 13:27:10.076 Unknown server extension posix-
rename@OpenSSH.com="1"
. 2012-08-01 13:27:10.076 Unknown server extension statvfs@OpenSSH.com="2"
. 2012-08-01 13:27:10.076 Unknown server extension fstatvfs@OpenSSH.com="2"
. 2012-08-01 13:27:10.076 We believe the server has signed timestamps bug
. 2012-08-01 13:27:10.076 We will use UTF-8 strings for status messages
only
. 2012-08-01 13:27:10.076 Limiting packet size to OpenSSH sftp-server limit
of 262148 bytes
. 2012-08-01 13:27:10.092 Getting current directory name.
. 2012-08-01 13:27:10.092 Getting real path for '.'
> 2012-08-01 13:27:10.092 Type: SSH_FXP_REALPATH, Size: 10, Number: 1296
. 2012-08-01 13:27:10.092 Sent 14 bytes
. 2012-08-01 13:27:10.092 There are 0 bytes remaining in the send buffer
. 2012-08-01 13:27:10.092 Waiting for another 4 bytes
. 2012-08-01 13:27:10.092 Detected network event
. 2012-08-01 13:27:10.092 Received 27 bytes (0)
. 2012-08-01 13:27:10.092 Read 4 bytes (23 pending)
. 2012-08-01 13:27:10.092 Read 23 bytes (0 pending)
< 2012-08-01 13:27:10.092 Type: SSH_FXP_NAME, Size: 23, Number: 1296
. 2012-08-01 13:27:10.092 Real path is '/'
. 2012-08-01 13:27:10.092 Listing directory "/".
> 2012-08-01 13:27:10.092 Type: SSH_FXP_OPENDIR, Size: 10, Number: 1547
. 2012-08-01 13:27:10.092 Sent 14 bytes
. 2012-08-01 13:27:10.092 There are 0 bytes remaining in the send buffer
```

```
. 2012-08-01 13:27:10.092 Waiting for another 4 bytes
. 2012-08-01 13:27:10.092 Detected network event
. 2012-08-01 13:27:10.092 Received 17 bytes (0)
. 2012-08-01 13:27:10.092 Read 4 bytes (13 pending)
. 2012-08-01 13:27:10.092 Read 13 bytes (0 pending)
< 2012-08-01 13:27:10.092 Type: SSH_FXP_HANDLE, Size: 13, Number: 1547
> 2012-08-01 13:27:10.092 Type: SSH_FXP_READDIR, Size: 13, Number: 1804
. 2012-08-01 13:27:10.092 Sent 17 bytes
. 2012-08-01 13:27:10.092 There are 0 bytes remaining in the send buffer
. 2012-08-01 13:27:10.092 Waiting for another 4 bytes
. 2012-08-01 13:27:10.248 Detected network event
. 2012-08-01 13:27:10.248 Received 1903 bytes (0)
. 2012-08-01 13:27:10.248 Read 4 bytes (1899 pending)
. 2012-08-01 13:27:10.248 Read 1899 bytes (0 pending)
< 2012-08-01 13:27:10.248 Type: SSH_FXP_NAME, Size: 1899, Number: 1804
> 2012-08-01 13:27:10.248 Type: SSH_FXP_READDIR, Size: 13, Number: 2060
. 2012-08-01 13:27:10.248 Sent 17 bytes
. 2012-08-01 13:27:10.248 There are 0 bytes remaining in the send buffer
. 2012-08-01 13:27:10.248 Read file '.' from listing
. 2012-08-01 13:27:10.248 Read file '..' from listing
. 2012-08-01 13:27:10.248 Read file 'gdbxx' from listing
. 2012-08-01 13:27:10.248 Waiting for another 4 bytes
. 2012-08-01 13:27:10.248 Detected network event
. 2012-08-01 13:27:10.248 Received 32 bytes (0)
. 2012-08-01 13:27:10.248 Read 4 bytes (28 pending)
. 2012-08-01 13:27:10.248 Read 28 bytes (0 pending)
< 2012-08-01 13:27:10.248 Type: SSH_FXP_STATUS, Size: 28, Number: 2060
< 2012-08-01 13:27:10.248 Status code: 1
> 2012-08-01 13:27:10.248 Type: SSH_FXP_CLOSE, Size: 13, Number: 2308
. 2012-08-01 13:27:10.248 Sent 17 bytes
. 2012-08-01 13:27:10.248 There are 0 bytes remaining in the send buffer
. 2012-08-01 13:27:10.248 Startup conversation with host finished.
. 2012-08-01 13:27:10.311 Session upkeep
. 2012-08-01 13:27:10.311 Detected network event
. 2012-08-01 13:27:10.311 Received 28 bytes (0)
. 2012-08-01 13:27:14.498 Session upkeep
. 2012-08-01 13:27:14.529 Closing connection.
. 2012-08-01 13:27:14.529 Sending special code: 12
. 2012-08-01 13:27:14.529 Sent EOF message
```

8 Appendix B

8.1 Naming conventions for Xetra Release 17.0 instrument reference data files

Public area:

| Backend Environment | Environment | Exchange Segment | Examples |
|---------------------|-------------|---------------------|--------------------------------------|
| Xetra Frankfurt 2 | Production | Xetra Specialist | 61FTXEONLNPUBLIC20121201XFRA.CSV.ZIP |
| Xetra Frankfurt 2 | Production | Structured Products | 61FTXEONLSPUBLIC20121201XFRA.CSV.ZIP |
| Xetra Frankfurt 2 | Simulation | Xetra Specialist | 62FTXEONLNPUBLIC20121201XFRA.CSV.ZIP |
| Xetra Frankfurt 2 | Simulation | Structured Products | 62FTXEONLSPUBLIC20121201XFRA.CSV.ZIP |

9 Appendix C

9.1 Markets and markets included

| CRE | Market | Environment | Included Market | MIC Code |
|------------|------------------------|--------------------------------|--|------------------------------|
| CRE area A | CCP | PRODUCTION | CCP SEC Lending | n.a. |
| | | SIMULATION | CCP SEC Lending | n.a. |
| | Derivatives Markets | PRODUCTION | EUREX EUREX FX Futures EEX Futures OTC Clear | XEUR XEUR XEEE n.a. |
| | | SIMULATION | EUREX T7 FX EEX Futures OTC Clear | XEUR XEUR XEEE n.a. |
| | Cash Markets | PRODUCTION | XETRA MALTA SE Cayman Islands SE BULGARIAN SE | XETR XMAL XCAY XBUL |
| | | SIMULATION | XETRA MALTA SE Cayman Islands SE BULGARIAN SE | XETR XMAL XCAY XBUL |
| | | ADVANCED SIMULATION | XETRA | XETR |
| | Xetra FFM2 | PRODUCTION | XETRA FFM2 | XFRA |
| | | SIMULATION | XETRA FFM2 | XFRA |
| | CRE area B | Regulatory Reporting Hub | PRODUCTION | RRH OTC Trade Reporting |
| SIMULATION | | | RRH OTC Trade Reporting | n.a. |
| Eurex Repo | | PRODUCTION | Eurex Repo | XEUP |
| | | SIMULATION | Eurex Repo | XEUP |

9.2 CRE Environment Number

00 - Eurex Clearing Production
01 - Eurex Clearing Simulation
10 - Regulatory Reporting Hub Production
16 - Regulatory Reporting Hub Simulation
14 - Eurex Repo Production
15 - Eurex Repo Simulation
19 - Eurex Repo Advanced Simulation
20 - CCP Production
21 - CCP Simulation
51 - T7 Cash Market Production (Xetra)
52 - T7 Cash Market Simulation (Xetra)
53 - Xetra Advanced Simulation
61 - Xetra FFM2 Production
62 - Xetra FFM2 Simulation
70 - EUREX FX Futures Production
75 - EUREX FX Futures Simulation
84 - Eurex OTC Production
85 - Eurex OTC Simulation
90 - T7 Derivatives Production (Eurex, EEX)
95 - T7 Derivatives Simulation (Eurex, EEX)

10 Appendix D - Server host key for the CRE

ssh-rsa

```
AAAAB3NzaC1yc2EAAAADAQABAAQACQDDYFfOKNFXSUDGNfAS8gUnv/IXNn4RiX3Oqi8dRGQivJ3MqmHrwUsejNcrMOZSBin8IAb  
+y3eK5SqQNYgfSj3S+wcrUslzB5R+Cd8LHqJXzDb3FM32lFOqHQQek6D555BqM8GzMhywwCu9tpzXKPS9MHvM8S/MEJ+TsoRd2J  
FC7f1DUKe5Y/fle+sht3BFjt6hy6j5EZsvTLRNYVmHw+WtmZXCiYyRFxbcglVqo00reWFXtxh5Z+j3QGpTmfXjnj9JARvXhZgAbmVT2b4  
MaDrlCk/dNsQhlcclfoukXvphPdQwWszxZ3Xcqbxvls01NOyeTJO1u1ntEpinNI7gWH68dfvcpRT6uv48o6SRbrX3n0wmh7sfODx3khBjL  
WKqfMYDgK8E4yEsh7E3iNjBBlpGpEOZVLadLiAxXZ3ZjqyOPtQ2a9lffwvzS67F0GwdjXAReej4SmXflel3EqYb7tx05VplfRjtzdGUBqECf  
710H3zH6niUcR8Kr6XfMrEvIFPwTntIM82Gfj0/U3pbvnxilxdYv4aWz2i+tZ3a92ffXCGkGrheMXYmiWrUCD90I+zQ5a3AEdjeD0hJXaoA  
odqkoEMSn+mTFXYMfKXUtTgqnBsNZAlw3eiG4jiS7UVp7oemiHYm1XoZnSERswjrDWH+W/5aX50h5S4jHqFZjXMRlw==
```

Fingerprint hashed with SHA-2:

```
n0wBgZcg2SSEqK0XYY/cU0ibOC4XoDVChfGi8tUdjgs
```

Fingerprint hashed with MD5:

```
8c:f4:cd:f2:48:30:64:01:04:75:24:47:bb:9d:a6
```

Appendix E

Links to actual Reports Reference Manuals and File descriptions

Eurex

Eurex T7: www.eurexchange.com

-> Technology -> Eurex Exchange's T7 -> System documentation -> Release "x" -> Eurex Reports

Eurex C7: www.eurexclearing.com

-> Technology -> Eurex Clearing's C7 -> System documentation -> Release "x" -> Eurex Reports

Eurex Reference Data Files (REFDAT): www.eurexchange.com

-> Technology -> Eurex Exchange's T7 -> System documentation -> Release "x" -> Market and Reference Data Interfaces

Eurex Clearing Prisma: Eurex Member Section: <https://member.eurexclearing.com>

after login -> Risk and Collateral Management -> Eurex Clearing PRISMA -> Documents & Circulars

Prisma Risk Parameters (Transparency Enabler Files - TE Files): www.eurexclearing.com

-> Risk management -> Risk parameters >Theoretical->Transparency enabler data

Risk Based Margining: Eurex Theoretical Price Files (THEO files): www.eurexclearing.com

->Technology->Eurex clearing classic system->System documentation->Eurex Reports

Eurex OTC: Eurex Member Section: <https://member.eurexclearing.com>

after login -> Technology -> EurexOTC Clear -> Interest Rate Swaps >

CCP

www.eurexclearing.com

-> Technology -> Eurex Clearing's Securities CCP -> System documentation -> Release "x" -> Technical Manuals ->

Xetra

Xetra (XETR until Release 17.0 + XFRA): Xetra Member Section <https://member.deutsche-boerse.com> after login

-> Cash Market Resources -> Documentation -> Release >

Xetra Cash Market on T7: www.xetra.com

-> Technology -> T7 Trading Architecture -> T7 System documentation -> Reports
