

Common Report Engine

User Guide

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List of Abbreviations

AP	Access Point
BF	Börse Frankfurt
BFZ	Börse Frankfurt Zertifikate
CRE	Common Report Engine
DBAG	Deutsche Börse AG
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
WinSCP	Windows Secure Copy (a free and open-source SFTP and FTP client for Windows)

Table of Contents

1	General information	5
1.1	Intended audience	5
1.2	Conventions used in this document.....	5
1.3	SSH File Transfer Protocol.....	5
1.4	SSH/SFTP tools	5
2	Overview	6
2.1	History	6
2.2	Features and functionality	6
2.3	Security, Authorisation and Access	6
2.4	Hardware requirements.....	7
2.5	Software requirements	7
3	Setup process	9
3.1	How to generate and save SSH key pair	9
3.2	Example for key generation using PuTTYgen (MS Windows).....	9
3.3	Example for key generation via Member Section.....	14
3.4	CRE user administration.....	15
4	Connecting to the CRE	20
4.1	MS Windows example using WinSCP	21
4.2	MS Windows example using PSFTP	24
4.3	Troubleshooting and Debugging examples.....	24
4.3.1	Error 1: No matching SSH key found.....	25
4.3.2	Error 2: No key used at all	26
4.4	Retrieving reports and files	26
4.5	Automated Download: Sample script.....	27
5	Structures and naming conventions	28
5.1	Directory structure in the CRE participant area	28
5.2	Directory structure in the CRE public area	29
6	Report and file naming conventions	30
6.1	General report naming conventions	31
6.1.1	Derivatives Markets report naming conventions	31
6.1.2	Cash Markets report naming conventions	33
6.1.3	CCP report naming conventions.....	34
6.1.4	Eurex Repo report naming conventions	35
6.1.5	EurexOTC Clear and Eurex Risk Operation report naming conventions.....	36
6.1.6	Regulatory Reporting Hub report naming conventions	37
6.1.7	Buy-In Agent report naming convention	38
6.2	General file naming conventions.....	38

6.2.1	T7 Derivatives Markets file naming conventions	38
6.2.2	T7 Derivatives Markets Reference Data File (RDF) naming conventions in public area	40
6.2.3	T7 Xetra Reference Data File (RDF) naming conventions in public area	41
6.2.4	T7 Börse Frankfurt and Börse Frankfurt Zertifikate Reference Data	42
6.2.5	CCP file naming conventions	43
6.2.6	Eurex Clearing Prisma file naming conventions in public area	44
6.2.7	Eurex Clearing Prisma file naming conventions for participant specific files	45
6.3	Corrupted reports and files	46
6.4	Report availability	46
6.5	Historical reports: Restore directory	46
6.6	Streamlined EOL encoding.....	46
7	Appendix A.....	47
7.1	Example of successful WinSCP connection log file.....	47
8	Appendix C.....	51
8.1	Markets and markets included	51
8.2	CRE Environment Number and Area.....	52
9	Appendix D - Server host key for the CRE	53
10	Appendix E.....	54
11	Change Log	56

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>).

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, Regulatory Hub and the Buy-In Agent 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.
 - Bilateral aggregation reports need to pre-select on the J-Trader GUI. Only the selected reports are provided via the CRE.
- 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.

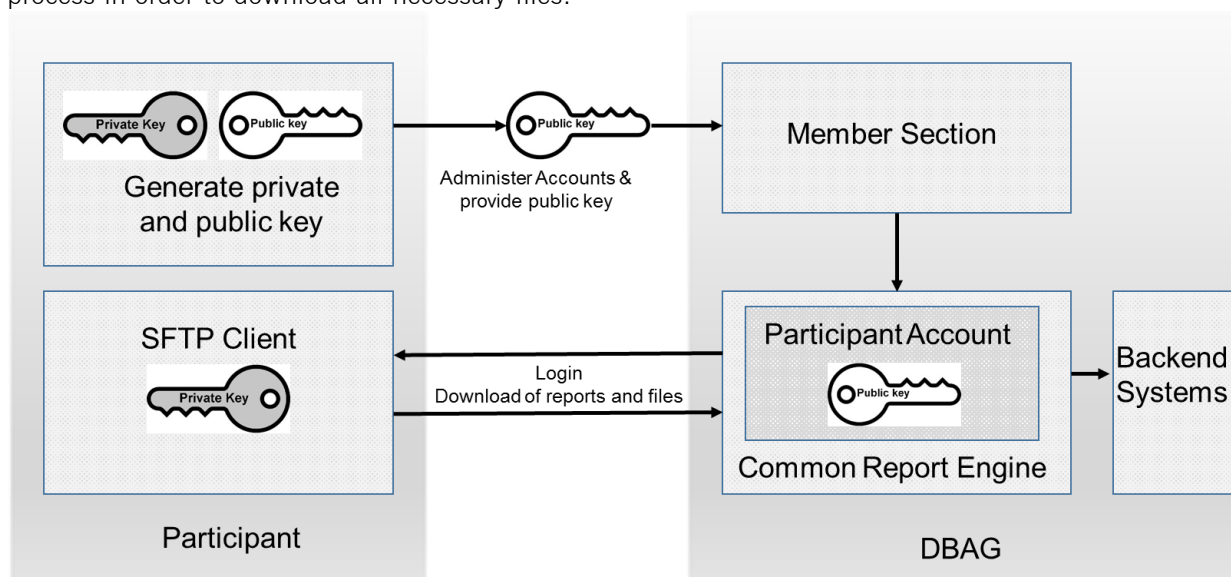


Fig. 1: Process overview to connect to the CRE

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. 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. Otherwise you can use the embedded Keygenerator tool in the Member Section

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.
-

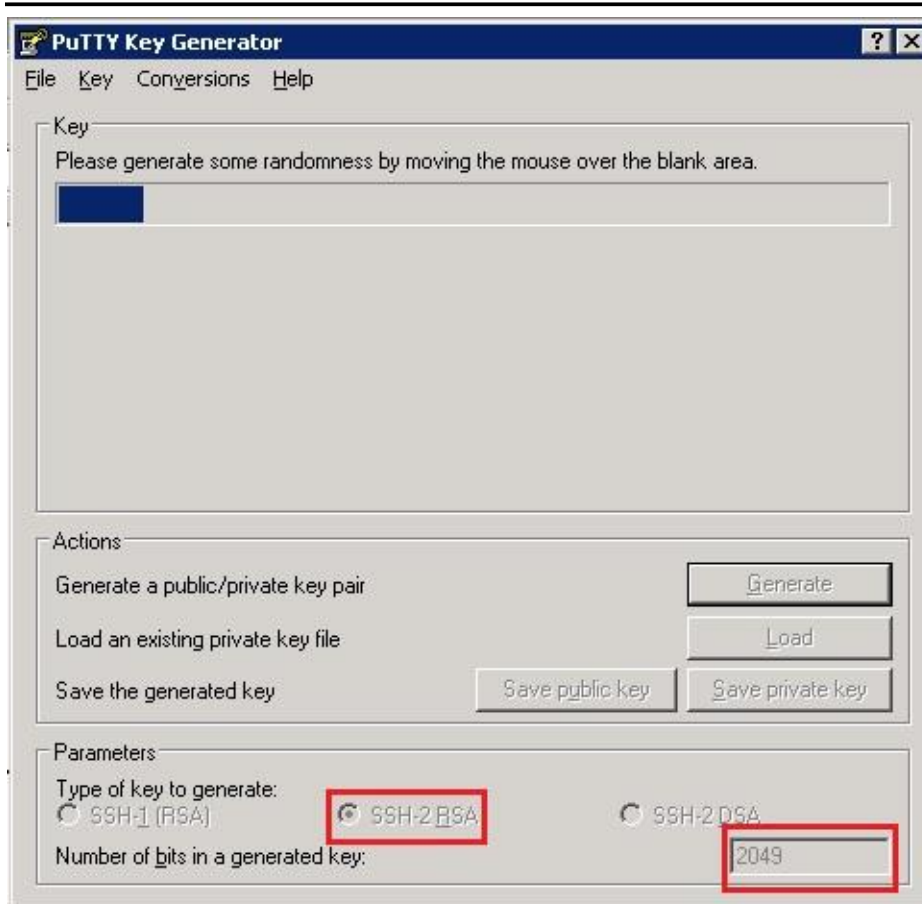


Fig. 2: Generate key (screenshot of PuTTYgen)

- 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.

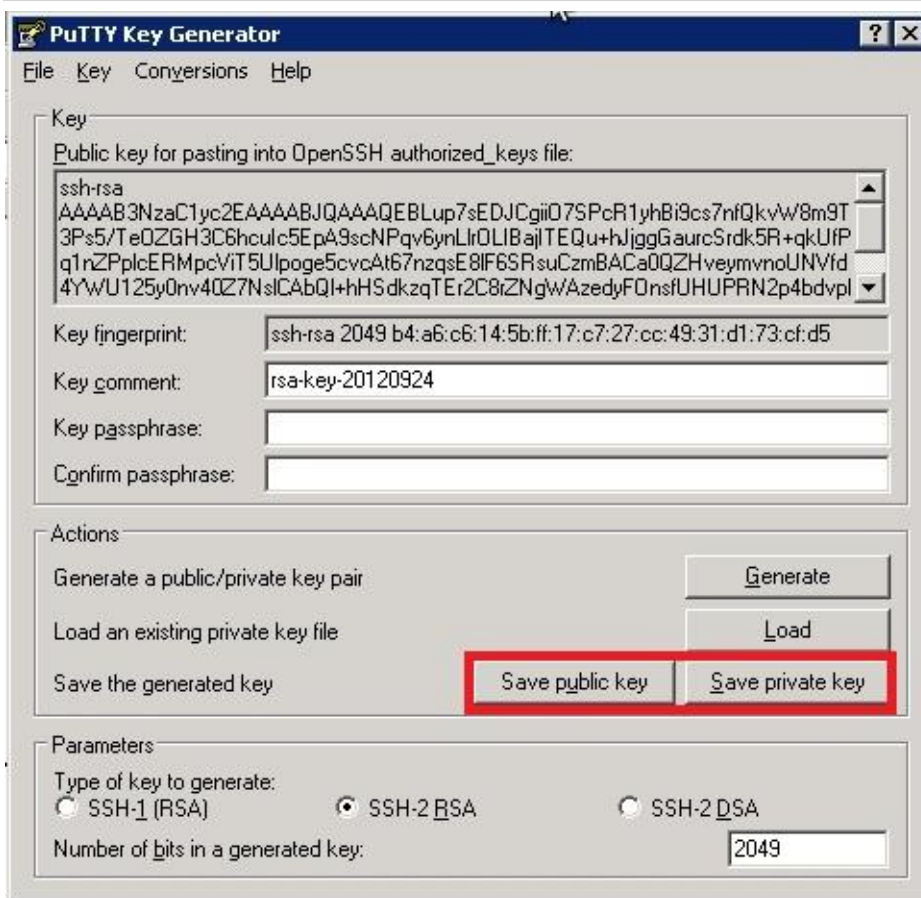


Fig. 3: Saving the generated public and private keys in the PuTTY format (screenshot from tool PuTTYgen)

- 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).

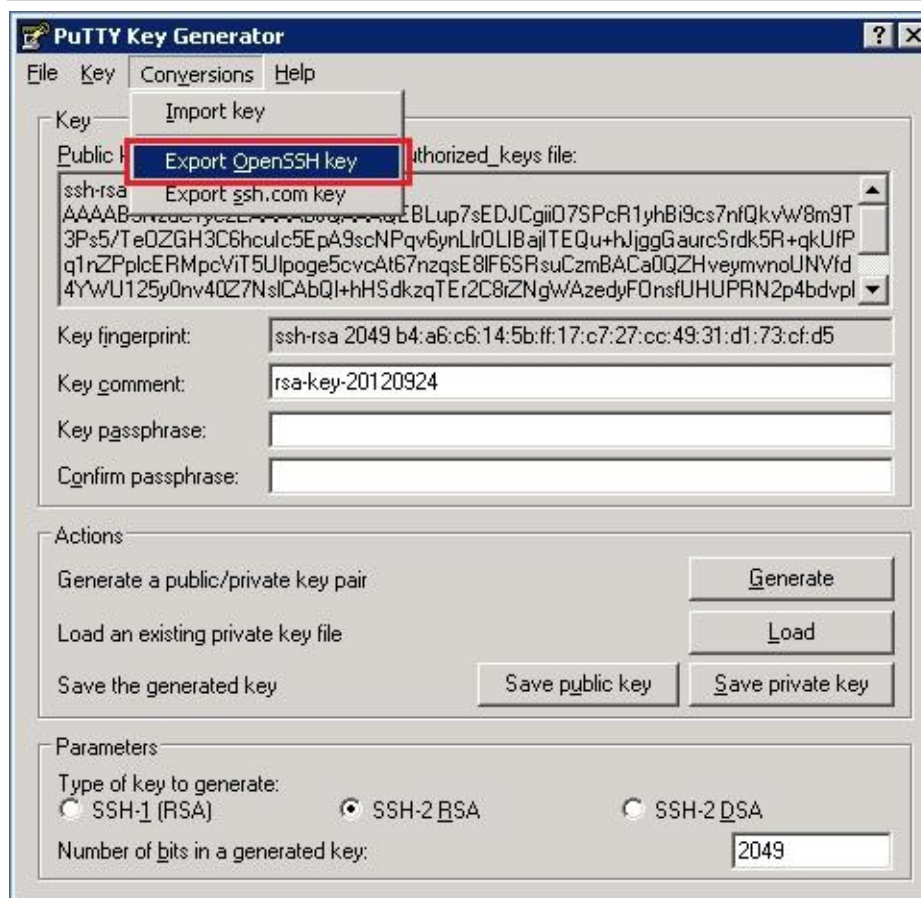


Fig. 4: Saving the OpenSSH private key for future use (screenshot from tool PuTTYgen)

- 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!

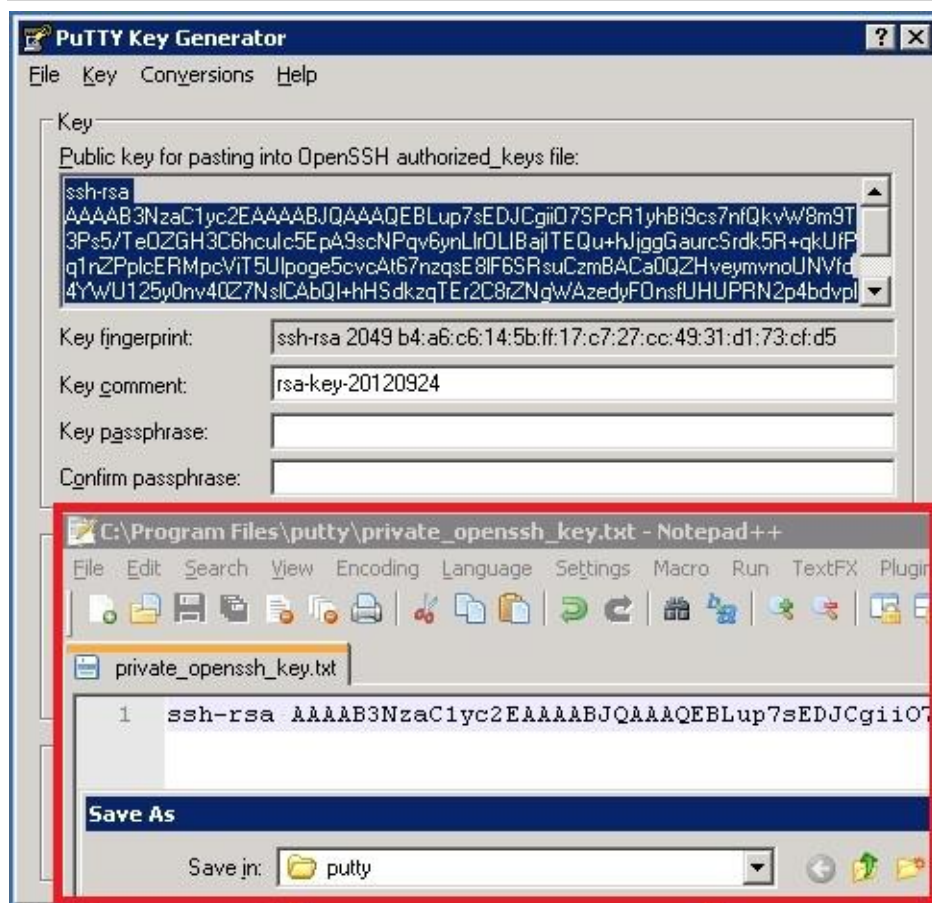


Fig. 5: Saving the public key for DBAG Member Section upload (screenshot from tool PuTTYgen and Nodepad++)

- 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 Example for key generation via Member Section

Step 1 Click "Add Certificate"

Certificates

Add Certificate Remove Certificate

Status	Valid From [dd.mm.yyyy]	Valid To [dd.mm.yyyy]	Comment
--------	-------------------------	-----------------------	---------

Certificate Data:

Step 2 Click "Start Keypair Generator" to start the application

Add Certificate

Upload Certificate

Start Keypair Generator

Datei auswählen Keine ausgewählt

Upload

Next Cancel

Step 3 Click "Generate" for a new keypair

Keylength: 2048

Passphrase:

Comment:

Generate

Step 4 Save your public and private key

Generate Keypair

Keylength: 2048

Passphrase:

Comment:

Generate

> Private Key

> Public Key

3.4 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.

Technical Connection
Membership
Incident Tickets
Requests & Configuration
Monitors and Statistics
 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
 Download Agent
 Eurex OTC Clear FpML Account
 T7 GUIs
 FXML Account
 Eurex Clearing GUIs Network Configuration
 Eurex Repo Certificates
 Enhanced Risk Solution Account
 Margin Calculator API Account
Report Engine User
Downloads
 Analysis Tools
 Reference Files

Report Engine User

CRE (Common Report Engine) is a service which offers single and multi-tenant Advanced Simulation environments.

Information: Please do not add more than 13 environments per member.

When new data is entered for reports, two batch runs will be triggered. CRE for download by the member. All other actions will be blocked until the next portal to CRE (Monday - Friday at 10 p.m.).

	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.

Examples of combinations for underlying markets:

Market	Underlying Market
EEX	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”.

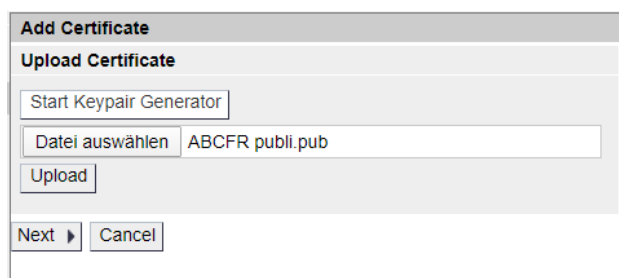


Fig. 8: Popup screen to upload the public key

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 + Börse Frankfurt) and partner exchanges
- T7 derivatives markets including Eurex trading, T7/FX and EEX
- Eurex Clearing's C7
- Eurex Clearing's PRISMA
- EurexOTC Clear
- CCP
- Xetra Release 17.0 participants

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

- Regulatory Hub
- Eurex Repo
- Buy-In Agent

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 193.29.90.67 2222
Trying 193.29.90.67...
Connected to 193.29.90.67.
Escape character is '^]'.
SSH-2.0-OpenSSH_5.3

Protocol mismatch.
Connection to 193.29.90.67 closed by foreign host.
# telnet 193.29.90.99 2222
Trying 193.29.90.99...
Connected to 193.29.90.99.
Escape character is '^]'.
SSH-2.0-OpenSSH_5.3

Protocol mismatch.
Connection to 193.29.90.99 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>

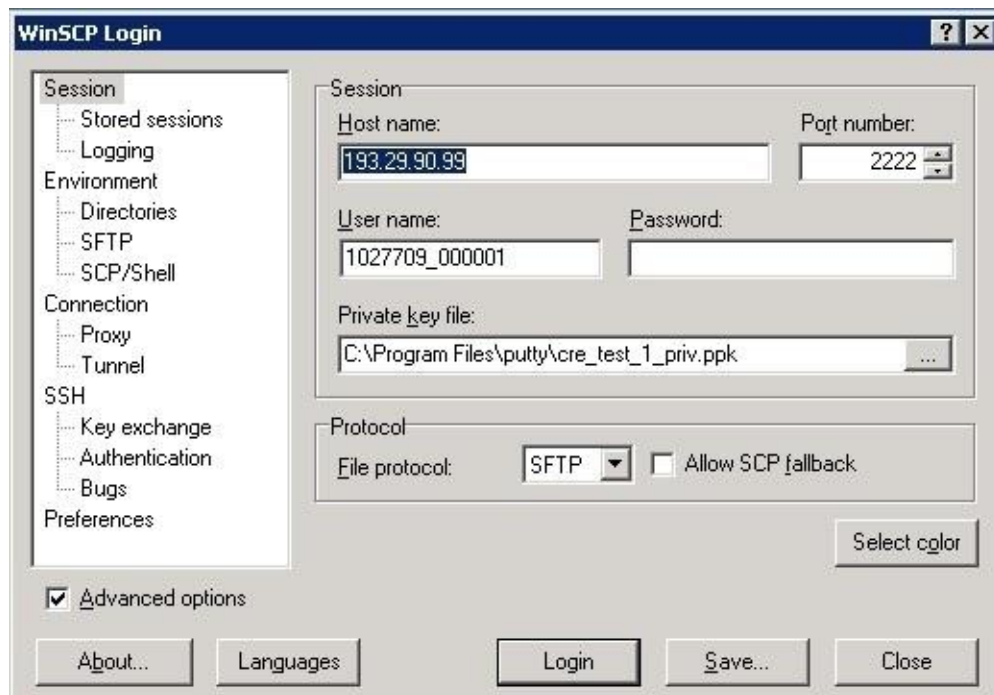


Fig. 12: Input screen required in order to log in to the CRE

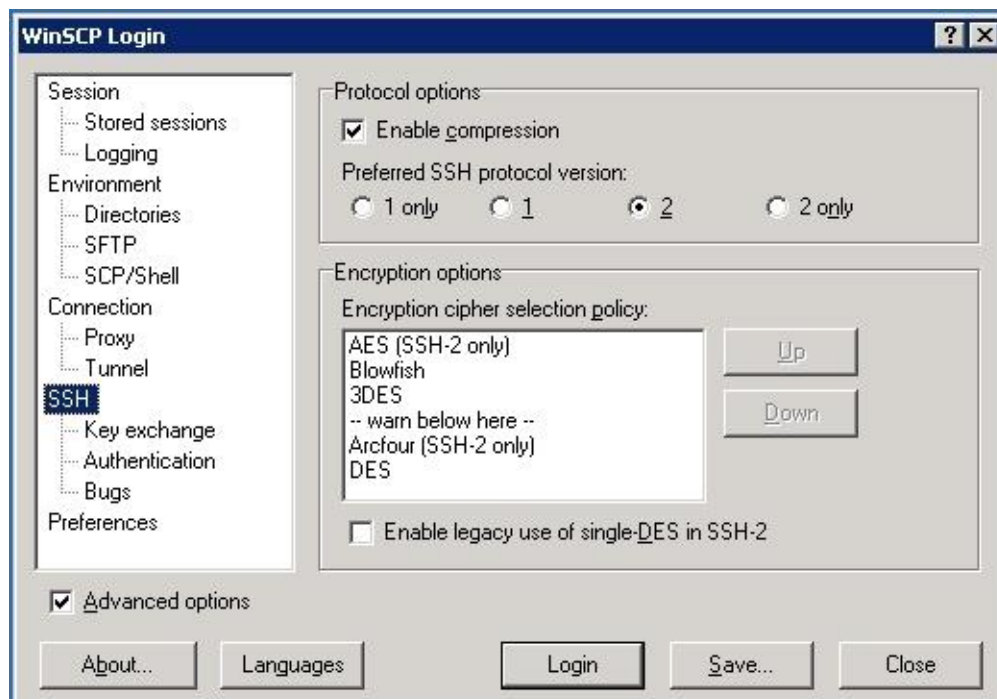


Fig. 13: Enable compression for ssh transfer.

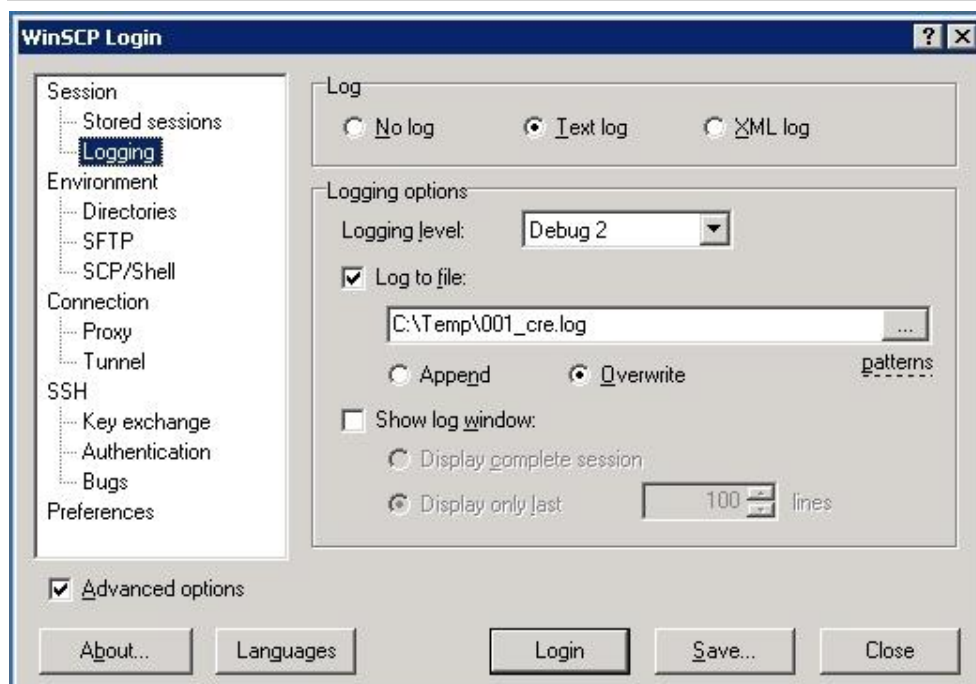


Fig. 14: Enable logging for WinSCP.

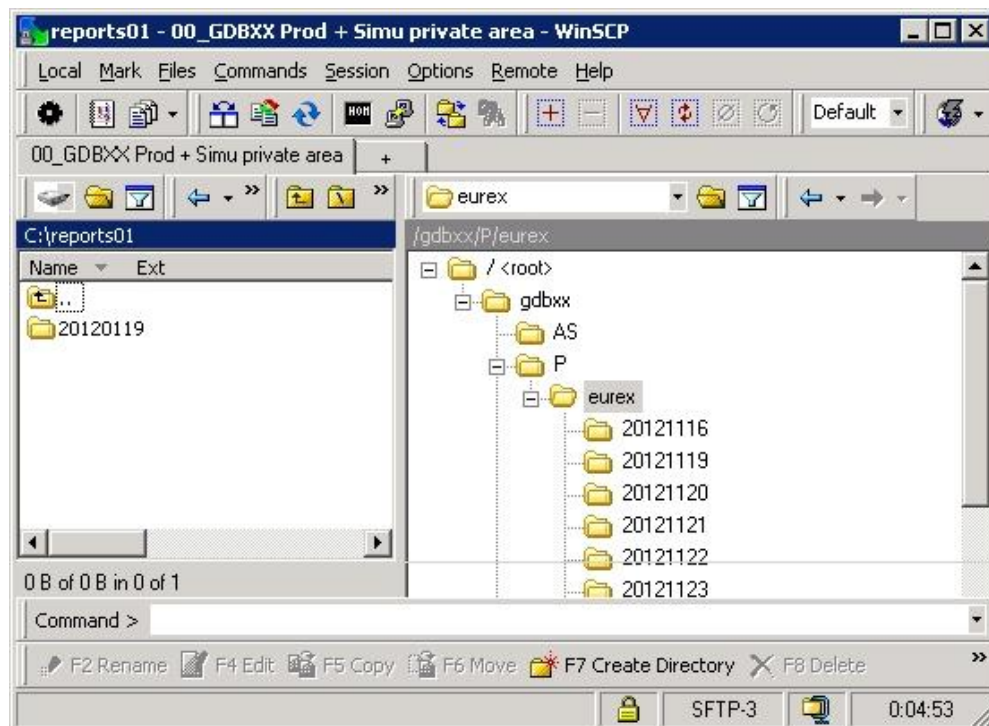


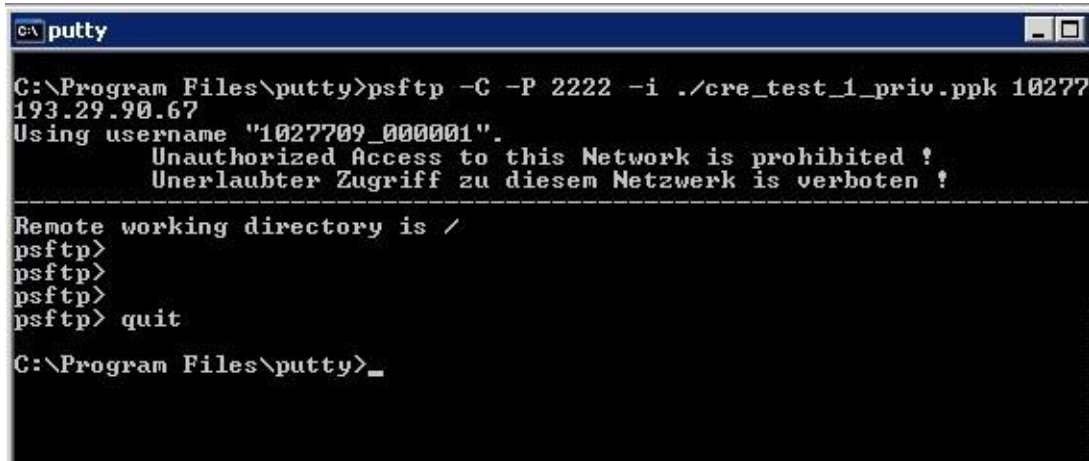
Fig. 15: Successful login to CRE member P section with WinSCP.

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.



```
C:\Program Files\putty>psftp -C -P 2222 -i ./cre_test_1_priv.ppk 10277
193.29.90.67
Using username "1027709_000001".
    Unauthorized Access to this Network is prohibited ?
    Unerlaubter Zugriff zu diesem Netzwerk ist verboten ?
-----
Remote working directory is /
psftp>
psftp>
psftp>
psftp> quit
C:\Program Files\putty>_
```

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@193.29.90.67

Connecting to 193.29.90.67...
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 193.29.90.67: 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@193.29.90.67

Connecting to 193.29.90.67...
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_rsa
debug3: no such identity: /root/.ssh/id_rsa
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 Börse Frankfurt production environment and for the Xetra and Börse Frankfurt 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:

```
[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.

Examples for 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 Flexindicator 2 Timestamp Sequence number ...	Optional Optional Optional 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.

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 or Xetra)
Compressed text format	(.TXT.ZIP)	(CB001 for Eurex)
Compressed XML format	(.XML.ZIP)	(CB001 for Eurex)

6.1.1 Derivatives Markets 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 Cash Markets report naming conventions

Field	Meaning	Remark
[0-9]{2}	Environment ID	Xetra T7 51 Prod, 52 Simu, Börse Frankfurt T7 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 T7 report:

51RPTTC810PAKFR20120301XETRT7.XML.ZIP

Current list of valid Xetra MIC codes for Xetra T7:	
XETR	Xetra Frankfurt
XMAL	Xetra Malta
XBUL	Xetra Bulgaria
XFRA	Börse Frankfurt

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 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

Example:

15RPTMTX01002XX2019032813GCPOOLOSGCP00.XLS.ZIP
14RPTMTX01002XX2019032813GCPOOLOSGCP00.XLS.ZIP

6.1.5 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:
00RPTCIO42GDBXX20121113123456.XML.ZIP

6.1.6 Regulatory Reporting Hub report naming conventions

Field	Meaning	Remark
[0-9]{2}	Environment ID	10 Prod, 16 Simu 2 numeric
[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!

6.1.7 Buy-In Agent report naming convention

Field	Meaning	Remark
[0-9]{2}	Environment ID	05 Prod, 04 Simu 2 numeric
[0-9A-Z]{8}	Report name	i.e. RPTBlxx 8 alphanumerics
[0-9A-Z]{5}	Member ID	i.e. GDBXX 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, XML.ZIP, TXT.ZIP, PDF.ZIP

Example Buy-In Agent report:
05RPTBI000MEMIDYYYYMMDD.PDF.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 T7 Derivatives Markets 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 T7 Derivatives Markets Reference Data File (RDF) naming conventions in public area

Field	Meaning	Remark
[0-9]{2}	Environment ID	90 Prod, 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: 90FILRDF01PUBLI20120903XEURITS00999.XML.ZIP

Example EEX RDF: 90FILRDF01PUBLI20120903XEEEITS00999.XML.ZIP

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

Field	Meaning	Remark
[0-9]{2}	Environment ID	51Prod, 52 Simu 2 numerics
[0-9A-Z]{8}	Report name and ID	i.e. FILRDF01(dynamic) FILRDF02 (static) 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
\.	Dot	
[A-Z]{3}\.ZIP	extension for compressed files	XML.ZIP

Example Xetra T7 RDF:

FILRDF01	FILRDF02
51FILRDF01PUBLI20131218XETR30SKW000.XML	51FILRDF02PUBLI20131218XETR.ZIP

Current list of valid Xetra MIC codes:

XETR Xetra Frankfurt
XBUL Xetra Bulgarien
XMAL Xetra Malta

6.2.4 T7 Börse Frankfurt and Börse Frankfurt Zertifikate Reference Data

Field	Meaning	Remark
[0-9]{2}	Environment ID	61 Prod, 62 Simu 2 numerics
[0-9A-Z]{8}	Report name and ID	i.e. FILRDF02 (static) FILRDF01 (BF+BFZ) FILRDF03 (BF) FILRDF04 (BFZ) FILRDF05 (BFZ BALFR) FILRDF06 (BFZ ICFFR) 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
\.	Dot	
[A-Z]{3}\.ZIP	extension for compressed files	XML.ZIP

Example:

62FILRDF02PUBLI20190506XFRA.ZIP

61FILRDF02PUBLI20190506XFRA.ZIP

62FILRDF01PUBLI20190506XFRA6CMHD000.XML.ZIP

62FILRDF01PUBLI20190506XFRA6CMHD000.CSV.ZIP

61FILRDF01PUBLI20190506XFRA6CMHD000.XML.ZIP

61FILRDF01PUBLI20190506XFRA6CMHD000.CVS.ZIP

6.2.5 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

6.2.6 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

6.2.7 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:

00FILTHEOICBKFRYYYYMMDDCBKFREUXCINTRO1_01.TXT.ZIP (Intraday)

00FILTHEOICBKFRYYYYMMDDCBKFREUXCEODX01_01.TXT.ZIP (End of day)

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 <https://deutsche-boerse.com/dbg-en/products-services/ps-technology/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@193.29.90.67
. 2012-08-01 13:27:08.342 Host name: 193.29.90.67 (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 "193.29.90.67"
. 2012-08-01 13:27:08.358 Connecting to 193.29.90.67 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 C

8.1 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 T7/FX EEX OTC Clear	XEUR XEUR XEEE n.a
		SIMULATION	EUREX T7/FX EEX 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
	Börse Frankfurt	PRODUCTION	Börse Frankfurt	XFRA
		SIMULATION	Börse Frankfurt	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
Eurex STS		PRODUCTION	BUY_IN_AGENT	n.a
		SIMULATION	BUY_IN_AGENT	n.a

8.2 CRE Environment Number and Area

CRE AREA – A	CRE AREA – B
00 Eurex Clearing Production	04 Eurex STS Buy-In Agent Production
01 Eurex Clearing Simulation	05 Eurex STS Buy-In Agent Simulation
20 CCP Production	10 Regulatory Reporting Hub Production
21 CCP Simulation	16 Regulatory Reporting Hub Simulation
51 T7 Cash Market Production (Xetra)	14 Eurex Repo Production
52 T7 Cash Market Simulation (Xetra)	15 Eurex Repo Simulation
53 Xetra Advanced Simulation	19 Eurex Repo Advanced Simulation
61 T7 Börse Frankfurt Production	
62 T7 Börse Frankfurt 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)	

9 Appendix D - Server host key for the CRE

ssh-rsa

```
AAAAB3NzaC1yc2EAAAADAQABAAQDDYFfOKNFXSUDGNfAS8gUnv/IXNn4RIX3Oqi8dRGQiVJ3MqmHrwUsejNcr  
MOZSBin8IAb+y3eK5SqQNYgfSj3S+wcrUslzB5R+Cd8LHqJXzDb3FM32lfOqHQQek6D555BqM8GzMhywwCu9tpzX  
KPS9MHvM8S/MEJ+TsoRd2JFC7t1DUKe5Y/f1e+sht3BFjt6hy6j5EZsvTLRNYVmHw+WtmZXCIYyRFxbcglVqo00reW  
FXtxh5Z+j3QGpTmfXjn9JARvXhZgAbmVT2b4MaDrIck/dNsQhlcclfoukXvphPdQwWszxZ3Xcqbxvls01NOyeTJO1u1nt  
EpinNI7gWH68dfvcpRT6uv48o6SRbrX3n0wmh7sfODx3khBjLWKqfMYDgK8E4yEsh7E3iNjBBlpGpEOZVLaDLiaXZ3  
ZjqyOPtQ2a9lfwvzS67F0GwdjXAReej4SmXf1ei3EqYb7tx05VplfRjtdGUBqECf7I0H3zH6niUcR8Kr6XfMrEv1FPwTntI  
M82Gfj0/U3pbvnxilxdYv4aWz2i+tZ3a92ffXCGkGrheMXYmiWrUCD90I+zQ5a3AEdjeD0hJXaoAodqkoEMSn+mTFXY  
MfKXUtTgqnBsNZAlw3eiG4jiS7UVp7oemiHYm1XoZnSERswjrDWH+W/5aX5Oh5S4jHqFZjXMRIw==
```

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
```

10 Appendix E

Links to actual Reports Reference Manuals and File descriptions

Eurex

Eurex T7

www.eurexchange.com

-> Technology -> T7 Trading architecture -> System documentation -> Release "x" -> Eurex Reports

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

-> Technology -> T7 Trading architecture -> System documentation -> Release "x" -> Market and Reference Data Interfaces

Eurex C7

www.eurexclearing.com

-> Technology -> Eurex Clearing's C7 -> System documentation -> Eurex Reports

Eurex Clearing Prisma: Eurex Member Section

<https://member.eurexclearing.com>

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

Eurex OTC: Eurex Member Section

<https://member.eurexclearing.com>

after login -> Technology -> EurexOTC Clear -> System Documentation

CCP

www.eurexclearing.com

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

Xetra

Xetra Cash Market T7 All Tradable Instruments

www.xetra.com

-> Instruments-> All tradable instruments -> Xetra

<https://member.deutsche-boerse.com>

after login -> Cash Market Resources -> Instruments

Börse Frankfurt and Börse Frankfurt Zertifikate T7 All Tradable Instruments

www.xetra.com

-> Instruments-> All tradable instruments -> Börse Frankfurt

<https://member.deutsche-boerse.com>

after login -> Cash Market Resources -> Instruments

Xetra and Börse Frankfurt Release and Report Documentation on T7

www.xetra.com

-> Technology -> T7 Trading Architecture -> System documentation -> Release "X"-> Reports

11 Change Log

- Xetra 17.0 sections deleted