



# **Report Retrieval Solution For Listed Derivatives Markets Technical Guide**

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## Modification History

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# **1 Overview**

## **1.1 Background**

This technical guide serves as a reference document for Clearing Participants (CPs) to retrieve DCASS and pre-trade risk management reports from HKEX through the secure file transfer protocol (SFTP) facility.

It covers the following areas of the SFTP facility:

- Technical Infrastructure
- Access to SFTP Facility;
- Operation of SFTP Facility;
- Registration of SFTP User Account; and
- Network configuration

## 2 Technical Infrastructure

### 2.1 SFTP Standard

The SFTP facility uses industry standard SFTP and the following protocols are supported:

Protocol	RFC	Remarks
SFTP	RFC 4251-4254	Secure Shell File Transfer Protocol
SSH Public Key File Format	RFC4716	SSH2 Public Key File Format Fingerprint: MD5 message-digest

Clearing Participants (CPs) are required to ensure that the SFTP software they use for report/file retrieve must adhere to the above standard.

### 2.2 Primary and Backup SFTP Facilities

The SFTP facility is set up at both the HKEX primary and secondary data centers. For normal operations, only the primary SFTP facility is in active mode. Under contingency situation where the primary SFTP facility becomes unavailable, HKEX will notify CPs to connect to the secondary SFTP facility.

### 3 Access to SFTP Facility

#### 3.1 User Accounts

For each CP, HKEX will assign two SFTP user accounts for retrieval of DCASS and pre-trade risk management reports (i.e. RX\_AUDIT, TP001 and RPI03 etc.).

The two SFTP user accounts are in the following format:

- CXXX001
- CXXX002

Where <CXXX> is the DCASS customer code of the CP. For example, CP with DCASS customer code CXYZ, two SFTP user accounts CXYZ001 and CXYZ002 would be assigned.

After registration, CPs may use either one of the assigned SFTP user accounts together with the respective SSH private key to login to the SFTP facility for retrieval of DCASS and pre-trade risk management reports.

#### 3.2 Secure Shell (SSH) Keys

The SFTP facility adopts Secure Shell (SSH) public-key authentication. For **each SFTP user account**, CPs need to generate a pair of SSH private and public keys, as well as a public key fingerprint, and register the public key and the public key fingerprint with HKEX.

##### 3.2.1 Public Key

HKEX accepts RSA 2048-bit public keys in SSH2 format.

For example:

```

---- BEGIN SSH2 PUBLIC KEY ----
Comment: SSH KEY
AAAAB3NzaC1kc3MAAACBAPY8ZOHY2yFSJA6XYC9HRwNHxaehvx5wOJ0rzZdzoSOXxbET
W6ToHv8D1UJ/z+zHo9Fiko5XybZnDIaBDHtblQ+Yp7Stxy1tHnXF1YLfKD1G4T6JYrdH
YI14Om1eg9e4NnCRleaQoZPF3UGfZia6bXrGTQf3gJq2e7Yisk/gF+1VAAAAFQDb8D5c
vwHWTZDPfX0D2s9Rd7NBvQAAAIEA1N92+Bb7D4KLYk3IwRbXblwXdkPggA4pfdtW9vGf
J0/RHd+NjB4eo1D+0dix6tXwYGN7PKS5R/FXPNwxHPapcj9uL1Jn2AWQ2dsknf+i/FAA
vioUPkmdMc0zuWoSOEsSNhVDtX3WdvVcGcBq9cetzrtOKWOocJmJ80qadxTRHtUAAACB
AN7CY+KKv1gHpRzFwdQm7HK9bb1LAo2KwaoXnadFgeptNBQeSXG1vO+JsvphVMBJc9HS
n24VYtYtsMu74qXviYjziVucWKjjKEb11juqnF0GD1B3VvmxHLmxnAz643WK42Z7dLM5
sY29ouevz4Xz2PuMch5VGPP+CDqzCM4loWgV
---- END SSH2 PUBLIC KEY ----

```

Each public key should be saved in a separate file with the following naming convention and sent to HKEX via email for registration:

- CXXX001.pub (public key for SFTP user account CXXX001)
- CXXX002.pub (public key for SFTP user account CXXX002)

Where <CXXX> is the DCASS customer code of CP.

### 3.2.2 Public Key Fingerprints

Public key fingerprints are MD5 hash digests of public keys in the format of 16 octets printed as hexadecimal with lowercase letters and separated by colons.

For example:

```
"c1:b1:30:29:d7:b8:de:6c:97:77:10:d7:46:41:63:87"
```

Each public key fingerprint should be saved in a separate (text) file with the following naming convention and sent to HKEX via email for registration:

- CXXX001.fpt (fingerprint of public key for SFTP user account CXXX001)
- CXXX002.fpt (fingerprint of public key for SFTP user account CXXX002)

SSH public keys and public key fingerprints together with the IP addresses of their designated SFTP client workstations for accessing SFTP facility should be submitted to HKEX through email for registration. See Section 5 for details.

**CPs SHOULD NOT submit their private keys to HKEX.**

## 4 Operation of SFTP Facility

### 4.1 Operation Hours

Operational hours of the SFTP facility are from 07:30 to 03:30 on business days.

All DCASS and pre-trade risk management reports will be available for retrieval via the SFTP facility within 10 calendar days after generation. CPs should retrieve and safe keep their reports in a timely manner.

### 4.2 Folder Structure

Each SFTP user account has two accessible folders on the SFTP facility, namely COMMON and CXXX where <CXXX> is the DCASS customer code of the CP.

Folder	Content
COMMON	Reports / files applicable to all CPs
CXXX	Reports / files applicable to designated CP <CXXX> only

SFTP user accounts under the same CP will access the same COMMON and CXXX folders. Thus both SFTP user accounts ('CXXX001' and 'CXXX002') can retrieve the same set of derivatives clearing and pre-trade risk management reports from the COMMON and CXXX folder distributed by HKEX.

### 4.3 Frequent Sign-on Control

Each SFTP user account will be restricted to a maximum of 5 times sign-on within 5 minutes. The account will be locked (unable to sign on) once it reaches 5 times within 5 minutes and automatically unlock for every 5 minutes.

For example, if a SFTP user account has signed on more than 5 times between 12:45:10 and 12:47:30, the account will be locked at 12:47:31 then unlocked at 12:50:00 automatically.



## 5 Registration of SFTP User Account

To register for SFTP User Accounts, CP should generate a pair of SSH keys per account; and submit their public key, public key fingerprint, and IP addresses for the designated SFTP client workstations to HKEX in a single zip file (see sample file below), together with a scanned copy of the completed registration form .

The file names of the zip file should follow the naming convention below:

- CXXX.zip (where <CXXX> is the DCASS customer code of CP) and containing

A. IP address template, filled-in with 2 IP addresses of the designated SFTP client workstations and file names of 2 Public Keys;

B. Public Key files (CXXX001.pub; CXXX002.pub) and

C. Public Key Fingerprint files (CXXX001.fpt; CXXX002.fpt)

A sample zip file can be found on the registration form.

**DO NOT** attaches private keys in the zip file. CPs shall keep their private keys confidential and prevent any unauthorized usage.

### 5.1 Renewal of Public Keys

CPs are recommended to renew their public keys at least every two years. CPs should also renew their keys immediately if the corresponding private keys become compromised. After generation of the new SSH keys, CPs should re-register their new public keys and public key fingerprints with HKEX.

## 6 Network Configuration

The SFTP facility is only accessible from the Securities and Derivatives Network/2 (SDNet/2) or HKEX Service Network (HSN).

CPs can register two designated SFTP client workstations for report retrieval. Follow Section 5 above, CPs should submit the IP addresses of their designated SFTP client workstations to HKEX for registration.

Upon registration of public keys and IP addresses, CPs can access HKEX SFTP facility with the assigned user accounts via either one of the registered SFTP client workstations.

IP addresses of the SFTP client workstations must be within the same subnet (first 3 octets) of SDNet/2 or HSN.

### 6.1 Connectivity of HKEX SFTP Facility

IP addresses of HKEX SFTP facility are as follows:

HKEX SFTP Facility at primary data center	HKEX SFTP Facility at secondary data center
10.151.14.121 port 10022	10.152.14.121 port 10022
10.151.14.122 port 10022	10.152.14.122 port 10022