



HKSCC Report Access Platform (RAP)

Technical Guide

Version: 1.0

Date: October 2019

Modification History

Version	Date	Modified By	Synopsis
1.0	Oct 2019	HKSCC	First issue

TABLE OF CONTENTS

TABLE OF CONTENTS	3
1 OVERVIEW	4
1.1 BACKGROUND.....	4
2 TECHNICAL INFRASTRUCTURE.....	5
2.1 SFTP STANDARD	5
2.2 PRIMARY AND BACKUP SFTP FACILITIES.....	5
3 ACCESS TO RAP VIA SFTP FACILITY	6
3.1 USER ACCOUNTS	6
3.2 SECURE SHELL (SSH) KEYS.....	6
3.3 PUBLIC KEYS	6
3.4 PUBLIC KEY FINGERPRINTS	7
4 OPERATION OF RAP	8
4.1 OPERATION HOURS	8
4.2 FOLDER STRUCTURE	8
4.3 FREQUENT SIGN-ON CONTROL.....	9
5 REGISTRATION OF RAP USER ACCOUNT	10
5.1 RENEWAL OF PUBLIC KEYS.....	10
5.2 RE-REGISTER OF PUBLIC KEYS.....	10
6 NETWORK CONFIGURATION	11
6.1 CONNECTIVITY OF RAP	11
7 IMPORTANT NOTES	13
7.1 USAGE GUIDELINES	13

1 OVERVIEW

1.1 Background

This document serves as a technical reference guide for HKSCC's Clearing Participants to retrieve (new risk reports/files) through HKSCC Report Access Platform (RAP) via a secure file transfer protocol (SFTP) facility provided by HKSCC.

It covers the following areas of the RAP:

- Technical Infrastructure
- Access to RAP via SFTP Facility
- Operation of RAP
- Registration of RAP User Accounts
- Network Configuration
- Important Notes

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

All Clearing Participants are required to ensure that the SFTP client (in house developed or third party software) installed in their RAP client workstations for report/file retrieval must adhere to the above standard.

2.2 Primary and Backup SFTP Facilities

There are two sets of SFTP facility setup at HKSCC's primary and secondary data centers respectively. Under normal situation, Clearing Participants should only connect to the primary SFTP facility. Under contingency situation where the primary SFTP facility becomes unavailable, HKSCC will then activate and switch the RAP connection to the secondary SFTP facility.

3 ACCESS TO RAP VIA SFTP FACILITY

3.1 User Accounts

To retrieve new risk reports/files, each Clearing Participant will be issued with two RAP user accounts by HKSCC for access to the RAP.

The two RAP user accounts are in the following format:

- Xnnnnnn001
- Xnnnnnn002

where Xnnnnnn is the Participant ID. For example, RAP user accounts B00001001 and B00001002 would be assigned to Clearing Participant with Participant ID B00001.

After registration (Note: Please refer to section 5 for registration information), Clearing Participants may use either one of the assigned RAP user accounts together with the respective SSH private key to login to the RAP for retrieval of NG reports/files. Upon receipt of the assigned user accounts, Clearing Participants are recommended to verify and ensure both of their assigned user accounts can access the RAP.

3.2 Secure Shell (SSH) Keys

SFTP facility adopts Secure Shell (SSH) public-key authentication. For **each RAP user account**, Clearing Participants need to generate a pair of SSH private and public keys, as well as a public key fingerprint, and register the public keys together with the public key fingerprints with HKSCC.

3.3 Public Keys

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

For example:

```
----- BEGIN SSH2 PUBLIC KEY -----
Comment: SSH KEY
AAAAB3NzaC1kc3MAAACBAPY8ZOHY2yFSJA6XYC9HRwNHxaehvx5wOJ0rzZdzoSOXxbET
W6ToHv8D1UJ/z+zHo9Fiko5XybZnDIaBDHtblQ+Yp7StxyltHnXF1YLfKD1G4T6JYrdH
YI14Om1eg9e4NnCRleaQoZPF3UGfZia6bXrGTQf3gJq2e7Yisk/gF+1VAAAAFQDb8D5c
vwHWTZDPfX0D2s9Rd7NBvQAAAIEAlN92+Bb7D4KLYk3IwRbXblwXdkPggA4pfdtW9vGf
J0/RHd+NjB4eo1D+0dix6tXwYGN7PKS5R/FXPNwxHPapcj9uL1Jn2AWQ2dsknf+i/FAA
vioUPkmdMc0zuWoSOEsSNhVDtX3WdvVcGcBq9cetzrtOKWOocJmJ80qadxTRHtUAAACB
AN7CY+KKv1gHpRzFwdQm7HK9bb1LAo2KwaoXnadFgeptNBQeSXG1vO+JsvphVMBJc9HS
n24VYtYtsMu74qXviYjziVucWKjjKEb11juqnF0GD1B3VVmxHLmxnAz643WK42Z7dLM5
sY29ouezv4Xz2PuMch5VGPP+CDqzCM4loWgV
----- END SSH2 PUBLIC KEY -----
```

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

- *Xnnnnnn*001.pub (public key for RAP user account *Xnnnnnn*001)
- *Xnnnnnn*002.pub (public key for RAP user account *Xnnnnnn*002)
- where *Xnnnnnn* is the Participant ID of Clearing Participant.

3.4 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 send to HKSCC via email for registration:

- *Xnnnnnn*001.fpt (fingerprint of public key for RAP user account *Xnnnnnn*001)
- *Xnnnnnn*002.fpt (fingerprint of public key for RAP user account *Xnnnnnn*002)

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

Clearing Participants SHOULD NOT submit their private keys to HKSCC for registration.

4 OPERATION OF RAP

4.1 Operation Hours and Time Schedule

Operation hours of RAP are from 07:00 - 24:00 on each business day.

All new risk reports/files will be kept on the platform available for retrieval for 10 calendar days after their generation. Clearing Participants should retrieve and safekeep their reports/files in a timely manner.

Clearing Participants should also observe the availability schedule of each of the corresponding reports/files as documented in the [\[List of new risk Reports and Data Files\]](#) (to be available by Q1 2020)].

4.2 Folder Structure

Each RAP user account has four accessible folders in RAP, as follows:

Folder	Usage
COMMON	For retrieval of common reports/files applicable to all Clearing Participants
INBOX	For retrieval of reports/files applicable to specific Clearing Participant <Xnnnnnn only>
OUTBOX	Reserved for future use : for file submission by Clearing Participants to HKSCC
KEY_MANAGEMENT	For submission of public keys for renewal by Clearing Participants

- a. RAP user accounts assigned for the same Clearing Participant, with same Participant ID can access the same set of folders. Thus both RAP user accounts ('Xnnnnnn001' and 'Xnnnnnn002') can retrieve same set of NG reports/files from the INBOX folder and COMMON folder for reports/files generated by HKSCC.
- b. The OUTBOX folder is reserved for future use; it is an empty folder.
- c. The KEY_MANAGEMENT folder is for submitting public keys for renewal, each RAP user account will be assigned with an individual KEY_MANAGEMENT folder and it cannot be shared with other RAP user.

4.3 Frequent Sign-on Control

Each RAP 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 be unlocked at every 5 minute interval.

For example, if a RAP 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 RAP USER ACCOUNT

To register for RAP User Accounts, Clearing Participants should generate a pair of SSH public & private keys per account; and submit their public key, public key fingerprint, and IP addresses of their designated RAP client workstations in a single zip file (see sample file below), together with the scanned copy of completed registration form to HKSCC via email. Please refer to the 'Registration Form for HKSCC Report Access Platform (RAP)' for details (to be available on HKEX website by end of 2019).

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

- *Xnnnnnn.zip* (where *Xnnnnnn* is the Participant ID of Clearing Participant) and containing
 - a. Completed Registration Form (attached with template, filled with the IP addresses of 2 RAP client workstations and file names of 2 Public Keys)
 - b. Public Key files (*Xnnnnnn001.pub* ; *Xnnnnnn002.pub*)
 - c. Public Key Fingerprint files (*Xnnnnnn001.fpt* ; *Xnnnnnn002.fpt*)

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

The zip file submitted previously will be overwritten by the newly submitted zip file.

DO NOT ATTACH private keys in the zip file. Clearing Participants shall keep their private keys confidential to prevent unauthorized usage.

5.1 Renewal of Public Keys

Clearing Participants are recommended to renew their public keys at least every two years. Clearing Participants should also renew their keys immediately if the corresponding private keys are become compromised. After generation of the new public keys, Clearing Participants should re-register their new public keys and public key fingerprints with HKSCC by submitting them to the KEY_MANAGEMENT folder. After submission, a result file will be generated and available for retrieval in the KEY_MANAGEMENT folder.

5.2 Re-register of Public Keys

In case any of the private key is lost or damaged, Clearing Participant should generate a new set of keys, register and submit the new public keys, public key fingerprints and the completed registration form to HKSCC for re-registration.

6 NETWORK CONFIGURATION

The RAP is only accessible from the Securities and Derivatives Network/2 (SDNet/2) which is designated for connection to Central Clearing and Settlement System (CCASS). Clearing Participants should refer to the [PC and Network Requirement](#) for the network configuration requirement.

Clearing Participants can register at most two designated client workstations for RAP. Follow Section 5 above, Clearing Participants should submit the IP addresses of their designated RAP client workstations to HKSCC for registration.

Upon registration of public keys and IP addresses, Clearing Participants can access RAP with their assigned user accounts via either one of their designated RAP client workstations.

IP addresses of RAP client workstations must fall within the same subnet of SDNet/2 for HKSCC, which is listed below table for reference.

SDNet IP addresses subnet
10.176.0.0/14
10.135.0.0/16
10.136.0.0/16
10.137.0.0/16

6.1 Connectivity of RAP

a. By DNS

Clearing Participants are recommended to connect RAP through hostname and resolve the IP address by Domain Name Service provided by HKSCC. RAP connection will be interrupted when there is a contingency that HKSCC needs to activate its secondary data center. Once RAP service is resumed, Clearing Participants could resume connection to RAP using the same hostname.

RAP Hostname and Port Number

HKSCC data center
rapcc.hkxposttrade.com.hk Port 10022

To enable workstation with DNS service, the following DNS server IP are required to be set up in Windows.

Domain Name System (DNS) Server Settings on Windows

Preferred DNS Server	Alternate DNS Server
10.243.1.1 (UDP 53)	10.243.65.1 (UPD 53)

b. By IP Address

Alternatively, Clearing Participants can connect RAP using the following IP addresses directly. Subject to Clearing Participants' own setup, when there is a contingency that HKSCC needs to activate its secondary data center; RAP connection will be interrupted. Once RAP service is resumed, Clearing Participants would need to change the IP address for RAP connection via the secondary data center.

IP addresses of RAP

Primary data center	Secondary data center
10.243.2.51 Port 10022	10.243.66.51 Port 10022

7 IMPORTANT NOTES

7.1 Usage Guidelines

1. Clearing Participants are recommended to poll and retrieve reports/files from RAP ONLY when needed e.g. around the time when the reports/files being available. In addition, any intensive polling should be avoided.
2. Usage management
For efficient use of network bandwidth and shorten download time, Clearing Participants are advised NOT to use command such as e.g. “mget *.*” when downloading files, otherwise all files retained in the folder (i.e. all reports/files for past 10 calendar days), will be downloaded. Clearing Participants are recommended to only retrieve those reports/files that have not been downloaded before.
3. CSV file format
Clearing Participants should note that the CSV files downloaded from RAP are in UNIX format in which the end of line is signified by only Line Feed (\n).