

在遠端伺服器的背景
執行 R code
(離線執行 R code)

Objective

- 遠端執行 R code 的運算
- 關閉 SSH 連線時，R code 可繼續在 server 的背景運算
- 可追蹤 R code 的運算進度

Material

- SSH 客戶端軟體
- FTP 客戶端軟體（需支援 sFTP）
- 可以自動輸出結果的 R code 重要！！！！

重要 ! ! ! ! ! ! ! !

儲存 R code 輸出成果

- 在你要執行的 .R 檔的最後一行，加上
save.image(" 儲存輸出成果檔案路徑 ")
- 範例如下：

```
### This loop will count down 6 hours
x <- 0
while(x<6*3600){
  x <- x + 1
  Sys.sleep(1)
  cat("\n",x)
}
cat("\n\n      Test Over!!!!")

### To save your result
save.image("~/wd/SECOND.RData")
```

Step 1:

準備 SSH 和 FTP 客戶端軟體

- SSH 服務
 - 遠端操控服務
 - 多為指令式的文字介面
- FTP 服務
 - 檔案傳輸服務
 - 類似雲端硬碟的概念
- 執行 SSH/FTP 前，需要有客戶端 (client) 的軟體，以便連線到伺服器
- 本教學以 Win7 作業系統，執行 **FireSSH**(SSH 客戶端) 與 **FileZilla**(FTP 客戶端) 為例。

Step 1-1:

安裝 FileZilla

- 知名的檔案傳輸軟體
- 跨平台
- 免費、開放原始碼
- 支援 FTP、sFTP、SSL 等多種傳輸協定
- 有親民的繁體中文介面。
- 至 <https://filezilla-project.org> 免費下載。



filezilla - Google Search

← → ↻ https://www.google.com.tw/search?q=filezilla&oq=file&aqs=chrome..69i59j0j69i57j69i60l3.1128j0j4&sourceid=chrome&es_sm=93&ie=UTF-8 ☆ ☰

Apps For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

Google+ Search Images Maps Play YouTube Gmail Drive More ▾ Sign in ⚙

Google filezilla 🔍

Web Images Videos News Apps More ▾ Search tools

About 1,500,000 results (0.20 seconds)

FileZilla - The free FTP solution 1. 進入 FileZilla 網站

<https://filezilla-project.org/>

Welcome to the homepage of **FileZilla**, the free FTP solution.
Both a client and a server are available. **FileZilla** is open source software distributed free of charge ...

Results from filezilla-project.org 🔍

| | |
|--|--|
| Download | Client Download |
| Client Download. | Client Download. |
| Screenshot. The latest stable version of FileZilla ... | Screenshot. The latest stable version of FileZilla ... |
| Server Download | Features |
| Server Download. | FileZilla Features. |
| Screenshot. The latest stable version of FileZilla ... | Overview. FileZilla Client is a fast and ... |

FileZilla download | SourceForge.net
sourceforge.net > Browse > Communications > File Sharing ▾

FileZilla_3.12.0.2_win....exe

Show all downloads...

下午 01:21
星期三
2015/8/12

Start

Chrome

File Explorer

Paint

Taskbar icons: Network, Volume, Safely Remove Hardware

System clock: 下午 01:22 星期三 2015/8/12

FileZilla - The free FTP solution

← → ↻ <https://filezilla-project.org>

Apps For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

FileZilla

The free FTP solution

Home

FileZilla

- Features
- Screenshots
- Download
- Documentation

FileZilla Server

- Download

Community

- Forum
- Project page
- Wiki

General

- Contact
- License
- Privacy
- Policy

Development

- Source code

Overview

Welcome to the homepage of FileZilla, the free FTP solution. Both a client and a server are available. FileZilla is open source software distributed free of charge under the terms of the GNU General Public License

Support is available through our [forums](#), the [wiki](#) and the [bug and feature request trackers](#).

In addition, you will find documentation on how to compile FileZilla and nightly builds for multiple platforms in the

2. 下載 client 客戶端

Download FileZilla Client
All platforms

Download FileZilla Server
Windows only

Pick the client if you want to transfer files. Get the server if you want to make files available for others.

News

2015-08-10 - FileZilla Client 3.13.0-rc2 released

Bugfixes and minor changes:

FileZilla_3.12.0.2_win....exe

Show all downloads...

FileZilla

The free FTP solution

Home

FileZilla

Features
Screenshots
Download
Documentation

FileZilla Server

Download

Community

Forum
Project page
Wiki

General

Contact
License
Privacy
Policy

Development

Source code
Nightly

Client Download

The latest stable version of FileZilla Client is 3.12.0.2

Please select the file appropriate for your platform below.

Windows (64bit)



This installer may include bundled

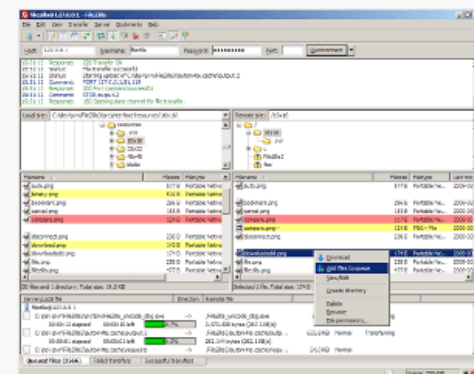
The 64bit versions of Windows Vista, 7, 8, 8.1 and 10 are supported.

More download options

Not what you are looking for?

[Show additional download options](#)

3. 下載對應系統的版本
(以 win 64bit 為例)



[Show all downloads...](#)



Recycle Bin



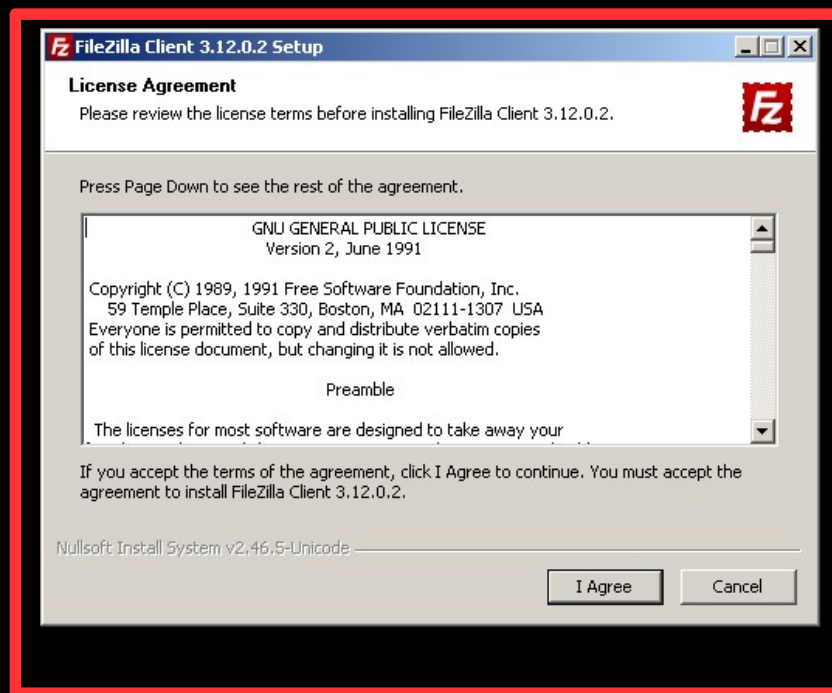
VirtualBox Guest Additions



SkypePortable



4. 打開安裝程式，按照步驟完成安裝



Step 1-2:

安裝 FireSSH

- FireSSH 是跨平台的 SSH 客戶端服務，最大特色是直接使用瀏覽器執行。不論是 Chrome 或是 Firefox，都可在瀏覽器的擴充功能區下載 FireSSH。（本教學以 **Chrome** 瀏覽器為例）

Start

Chrome Web Store - fireSSH x

https://chrome.google.com/webstore/search/fireSSH?hl=en-US&utm_source=chrome-ntp-launcher

Apps For quick access, place your bookmarks here on the bookmarks bar. [Import bookmarks now...](#)

FileZilla-3.12.0.2 web store

fireSSH x

« Home

☐ Apps

☐ Extensions

☐ Themes

FEATURES

☐ Runs Offline

☐ By Google

☐ Free

☐ Available for Android

☐ Works with Google Drive

RATINGS

★★★★★

★★★★★ & up

★★★★★ & up

Sign in

1. 至 web store 下載 FireSSH

More App Results

FireSSH

offered by firessh.net

SSH Client for Google Chrome

+ ADD TO CHROME

Developer Tools

★★★★★ (64)

Secure Shell

chrome-secure-shell-publishers

Terminal emulator and SSH client.

★ RATE IT

Utilities

★★★★★ (2476)

sFTP Client

offered by www.sftpclient.co.uk

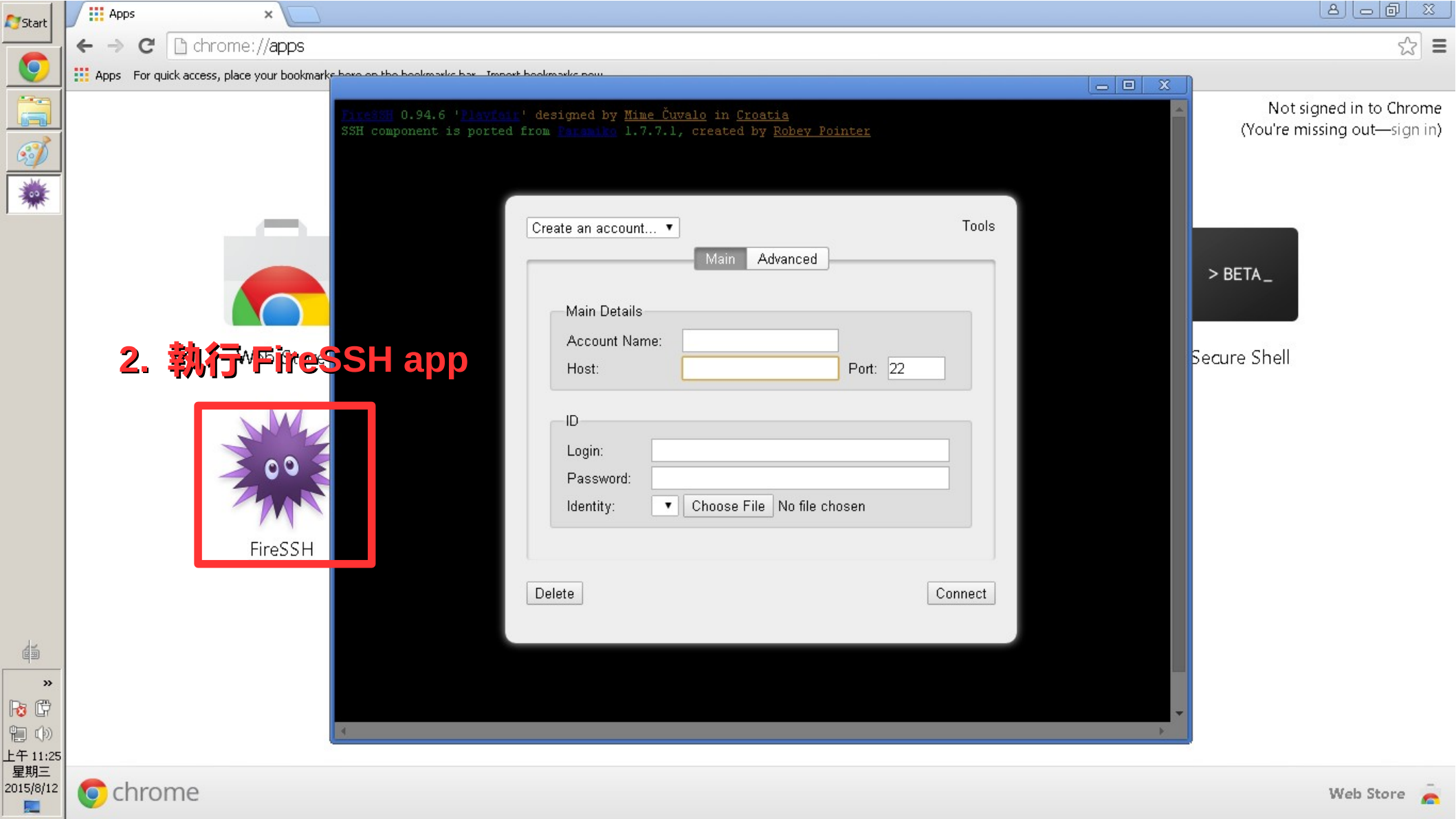
Access your Local/Remote FTP server (including your NAS drive), local server, VPS, dedicated server, cloud server or shared hosting.

+ TRY NOW

Developer Tools

★★★★★ (420)

上午 11:23
星期三
2015/8/12



2. 執行 FireSSH app

Step 2:

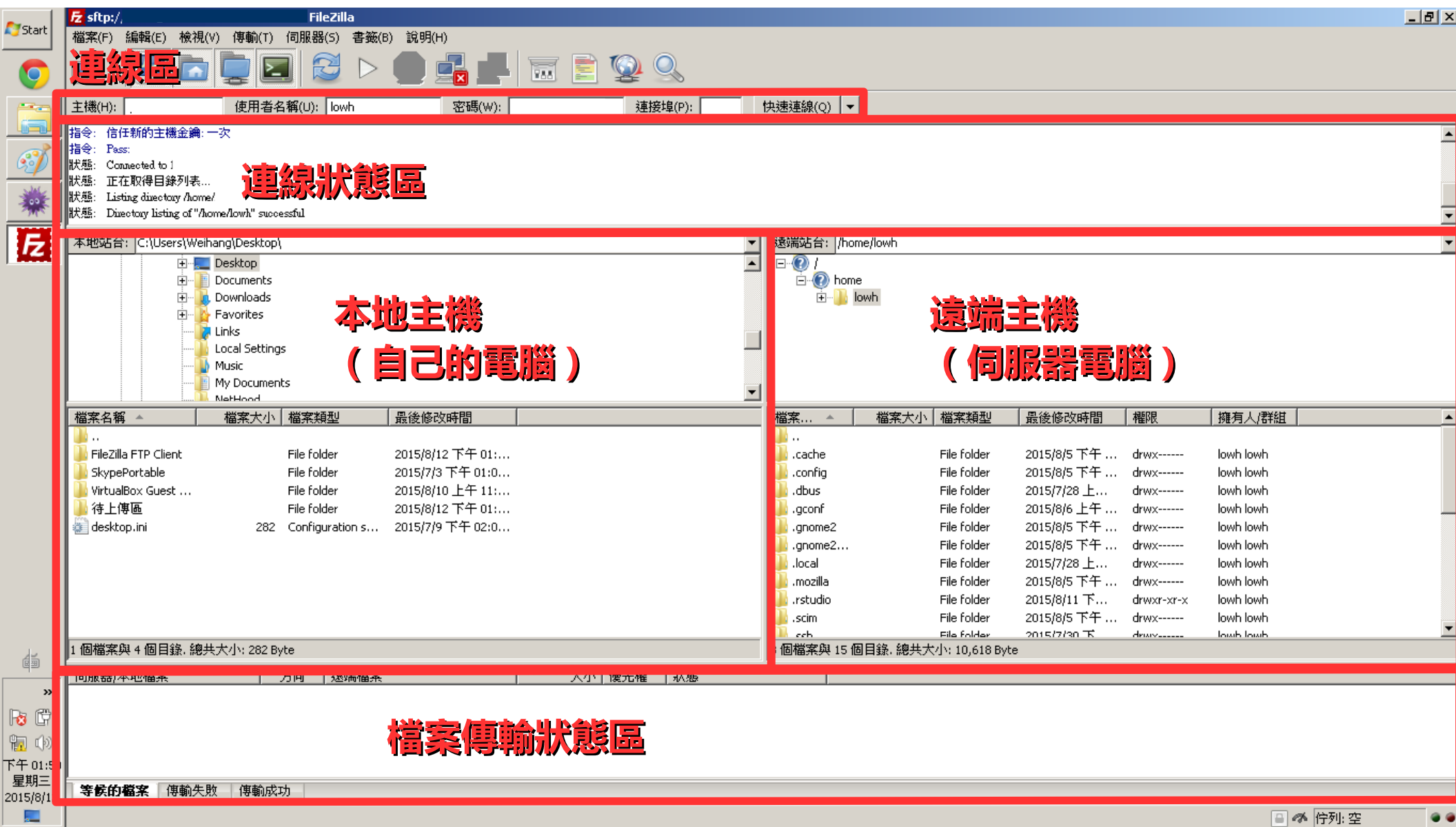
利用 FileZilla 傳輸 R code RData

- FileZilla 的介面主要分為

- 連線區
- 連線狀態區
- 本地主機區
- 遠端主機區
- 檔案傳輸狀態區

- 傳輸檔案方式

- 拖曳檔案
- 雙擊點選檔案

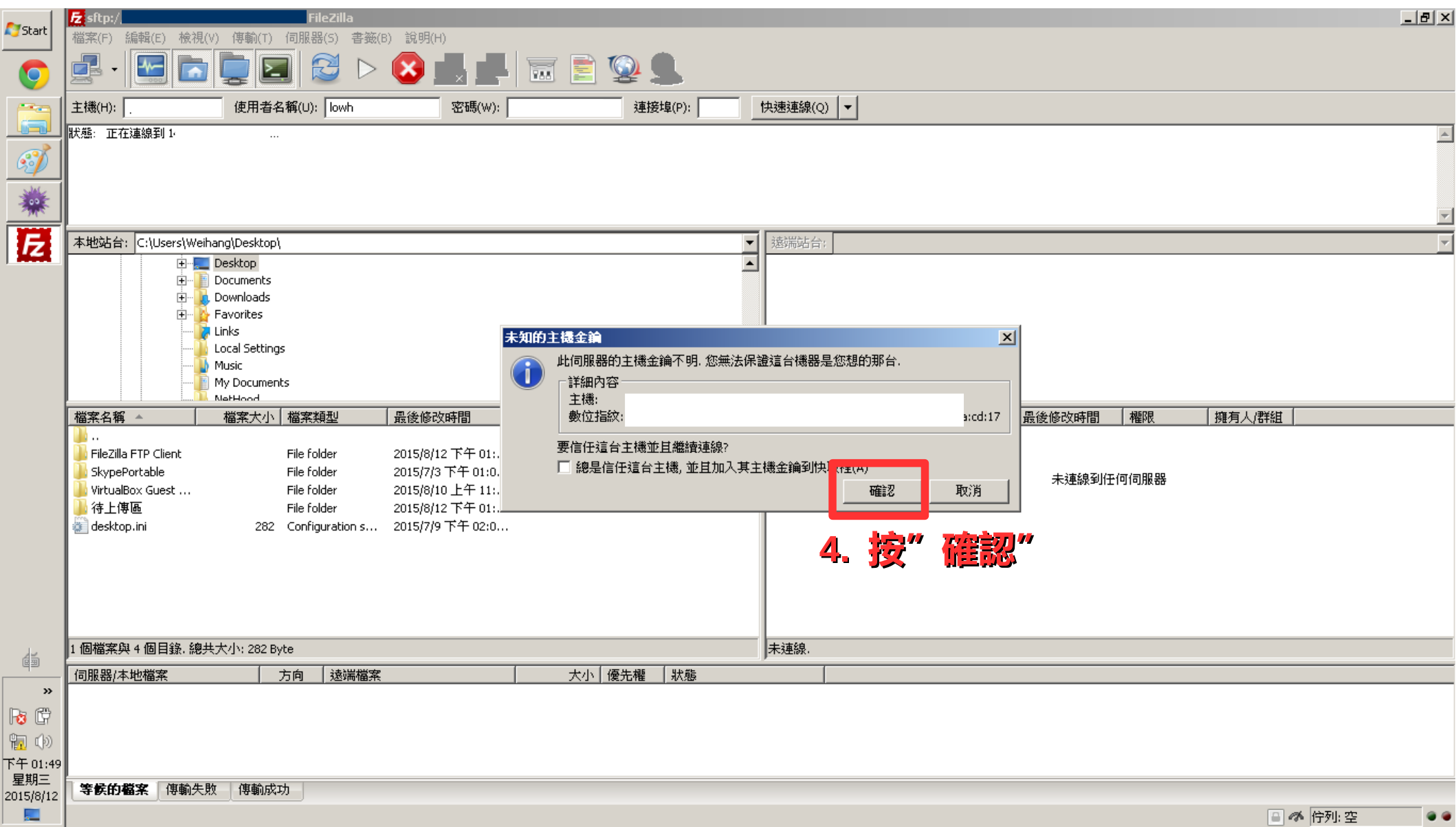


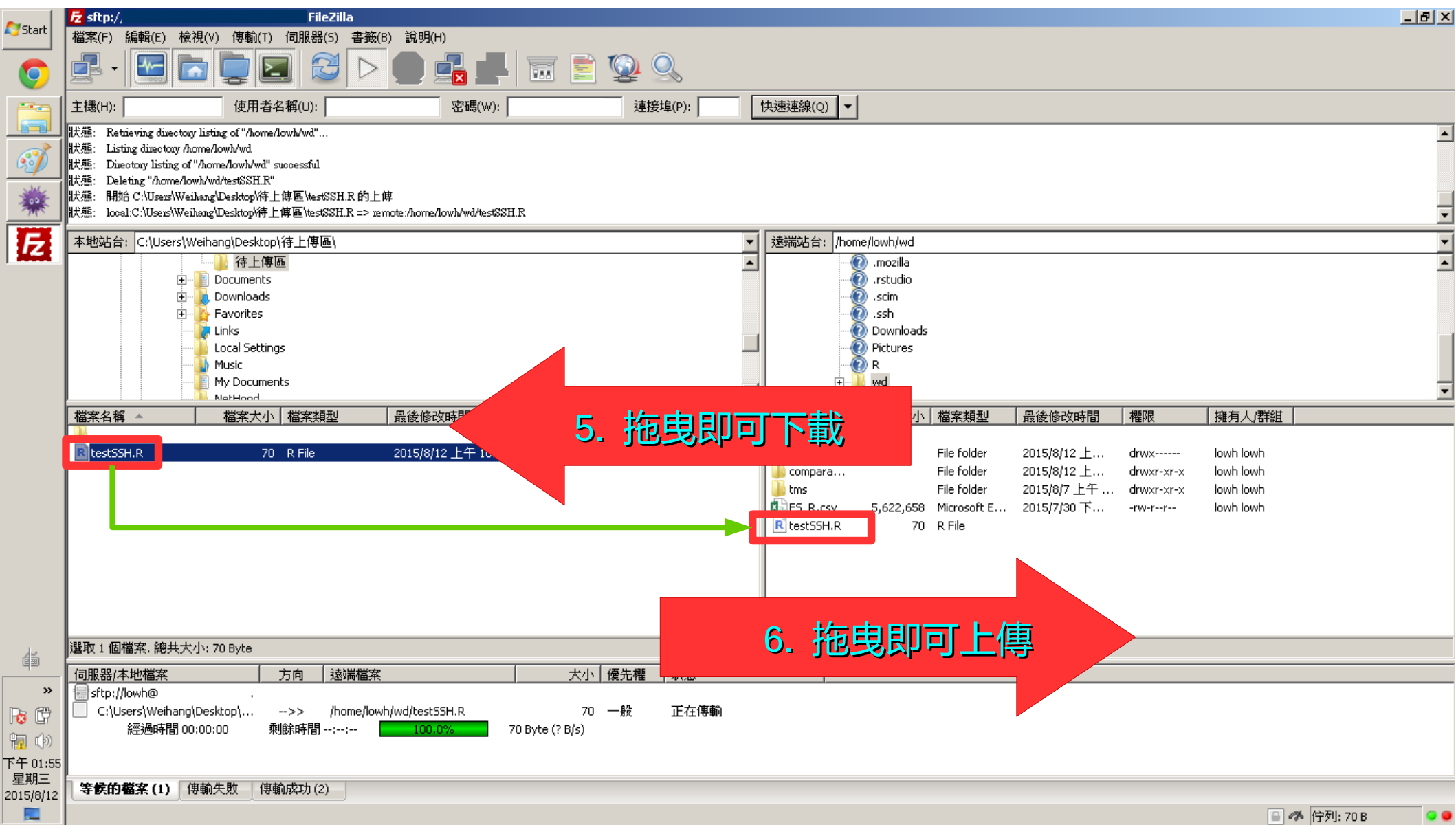
2. 輸入帳號與密碼

3. 輸入連接埠

1. 輸入伺服器端 IP : sftp://XXX.XXX.XXX.XXX



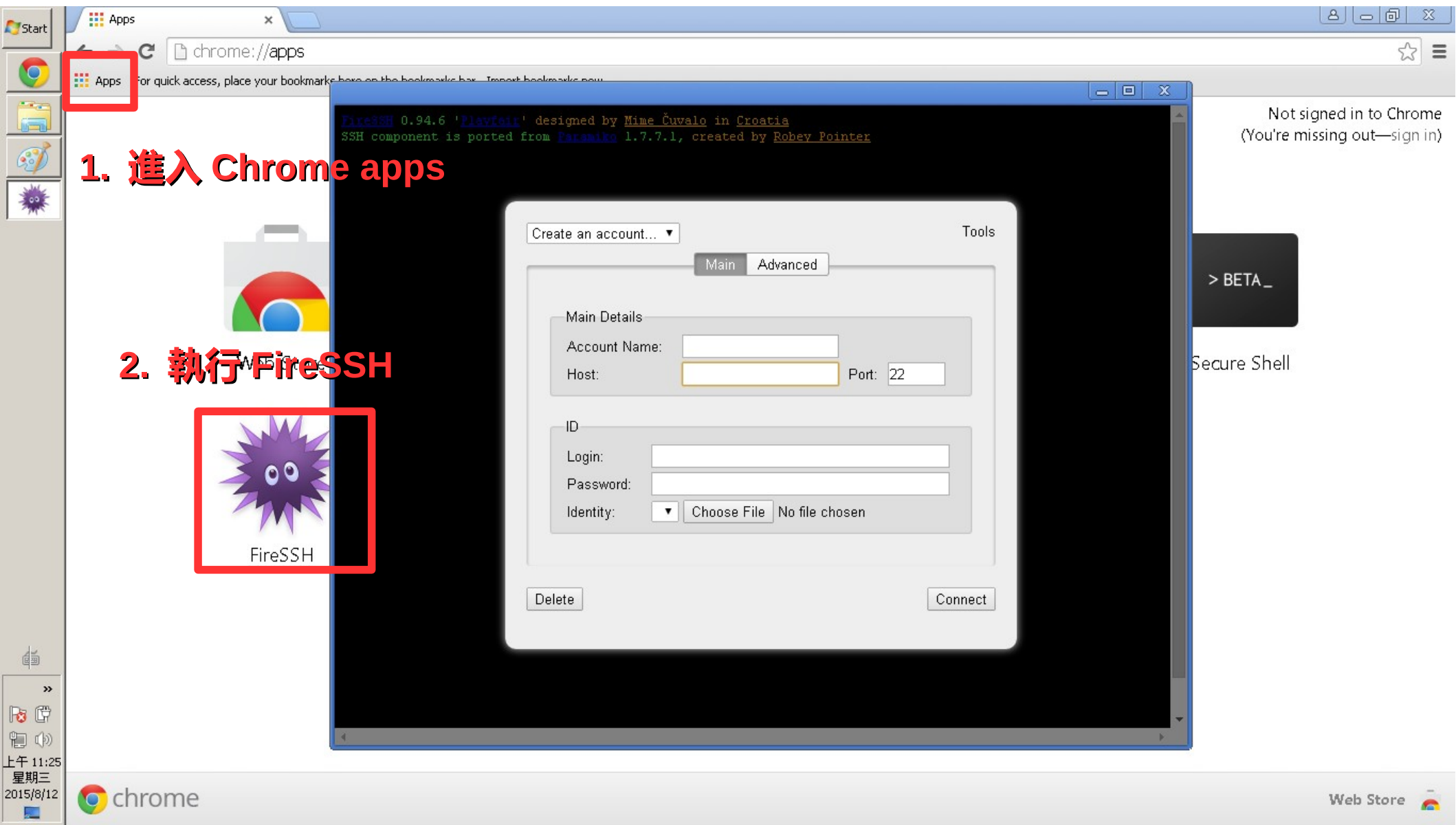




Step 3:

利用 SSH 在伺服器背景執行 R code

- 透過指令與電腦對話，主要指令包括
 - `ls` [欲顯示的目錄路徑] ##### 路徑可有可無
 - 功能：顯示當前目錄下的檔案與資料夾
 - 範例：`ls ~/Download/`
 - `cd` [欲進入的目錄路徑]
 - 功能：進入該路徑的目錄資料夾
 - 範例：`cd ~/wd/tms/`
 - `R < [.R 檔路徑] > [設定 .Rout 進度檔輸出位置] --vanilla &`
 - 功能：在背景執行 R code，可登出 SSH 或關機，讓伺服器自行運算
 - 範例：`R < ~/wd/test.R > ~/wd/TEST.Rout --vanilla &`
 - `--vanilla` 代表不要自動儲存或讀取 RData，保持 workspace 的乾淨
 - `&` 代表讓程式在背景執行。**非常重要！！！！！！！！**



1. 進入 Chrome apps

2. 執行 FireSSH



FireSSH 0.94.6 'Playfair' designed by [Mime Ćuvalo](#) in [Croatia](#)
SSH component is ported from [Paramiko](#) 1.7.7.1, created by [Robey Pointer](#)

3. 輸入伺服器端 IP :
XXX.XXX.XXX.XXX

4. 輸入連接埠

Tools

Main Advanced

Main Details

Account Name: server1

Host: 140.112. Port:

ID

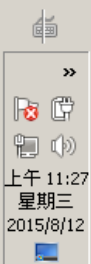
Login: lowh

Password:

Identity: Choose File No file chosen

Delete Connect

5. 輸入帳號與密碼





FireSSH 0.94.6 'Playfair' designed by Mime Čuvalo in Croatia
SSH component is ported from Paramiko 1.7.7.1, created by Robey Pointer
Connecting to [redacted] ...

Add key to cache?

The server's host key is not cached in the registry.
You have no guarantee that the server is the computer you think it is.

The server's rsa2 key fingerprint is:

ssh-rsa 2048

60 [redacted] 19:38 [redacted] 70 [redacted]

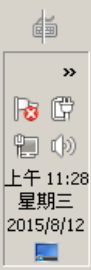
If you trust this host, press "Yes" to add the key to the cache and carry on connecting.
If you do not trust this host, press "Cancel" to abandon the connection.

Cancel

No

Yes

8. 按 "Yes"



The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.

Last login: Wed Aug 12 15:03:23 2015 from [REDACTED]

lowh@FMLserver1:~\$

9. 進入 SSH 服務的終端機界面

[使用者帳號]@[主機/伺服器名稱]:[當前路徑位置]\$

P.S. ~ 代表使用者家目錄，例如使用者為 lowh，~ 代表 /home/lowh/ 這個路徑



```
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.
```

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.
```

```
Last login: Wed Aug 12 15:25:01 2015 from 192.168.1.1
```

```
lowh@FMLserver1:~$ ls
```

```
Downloads Pictures R wd
```

```
lowh@FMLserver1:~$ cd ~/wd/
```

```
lowh@FMLserver1:~/wd$ ls
```

```
3P Sampling comparative study FS_R.csv testSSH.R tms
```

```
lowh@FMLserver1:~/wd$
```

10. 輸入 **ls** , 查看當前目錄下所有檔案與資料夾

11. 輸入 **cd [路徑位置]** , 進入該路徑資料夾

12. 當前目錄已改變為 **cd** 進入的資料夾

指令介紹 :

ls 顯示該路徑下的所有東西

cd [想進入的資料夾路徑]

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.

Last login: Wed Aug 12 15:25:01 2015 from [REDACTED]

lowh@FMLserver1:~\$ ls

Downloads Pictures R wd

lowh@FMLserver1:~\$ cd ~/wd/

13. 輸入 R , 準備開始跑 R code

lowh@FMLserver1:~/wd\$ ls

3P Sampling comparative study FS R.csv testSSH.R tms

lowh@FMLserver1:~/wd\$ R < testSSH.R > FIRST test.Rout --vanilla &

[1] 4659

lowh@FMLserver1:~/wd\$

指令介紹：R < [R code 路徑] > [R 運算進度檔路徑] --vanilla &

--vanilla：不自動儲存與讀取 RData
&：在背景執行程式

Step 4:

追蹤 R code 的運算進度

- 讀取 .Rout 檔案進行追蹤，指令如下：
 - tail [檔案路徑]
 - 功能：在終端機介面上顯示檔案倒數幾行
 - 範例：tail ~/worksapce/test/TEST.Rout
 - cat [檔案路徑]
 - 功能：在終端機介面上顯示完整檔案內容
 - 範例：cat ~/wd/test/TEST.Rout



```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
```

```
Last login: Wed Aug 12 15:25:01 2015 from [REDACTED]
```

```
lowh@FMLserver1:~$ ls
```

```
Downloads Pictures R wd
```

```
lowh@FMLserver1:~$ cd ~/wd/
```

```
lowh@FMLserver1:~/wd$ ls
```

```
3P Sampling comparative study FS_R.csv testSSH.R tms
```

```
lowh@FMLserver1:~/wd$ R < testSSH.R > FIRST_TEST.Rout
```

```
Fatal error: you must specify '--save', '--no-save' or '--vanilla'
```

```
lowh@FMLserver1:~/wd$ R < testSSH.R > FIRST_TEST.Rout --save &
```

```
[1] 4544
```

```
lowh@FMLserver1:~/wd$ tail FIRST_TEST.Rout
```

```
26
27
28
29
30
31
32
33
34
```

1. 輸入 tail , 監控 R 運算的進度

指令介紹 : tail [R 運算進度檔路徑]
功能 : 看檔案內容最後幾行

2. 安心關機，伺服器會繼續幫你運算

 Shutting down...

 Windows 7 Enterprise

```
lowh@FMLserver1:~/wd$ tail FIRST_TEST.Rout
```

```
299
```

```
300>
```

```
> cat("\n\n    Test Over!!!!")
```

```
Test Over!!!!>
```

```
>
```

```
> ### To save your output result
```

```
> save.image("~/wd/FIRST_test.RData")
```

```
>
```

```
lowh@FMLserver1:~/wd$ ls
```

```
3P Sampling
```

```
comparative study
```

```
lowh@FMLserver1:~/wd$
```

```
FIRST_test.RData
```

```
FS_R.csv
```

```
tms
```

```
testSSH.R
```



3. 重新開機，輸入 tail，監測 R 運算進度

4. 輸入 ls，檢查該路徑下是否有 FIRST_test.RData

5. 成功輸出 RData，運算完畢！

Start

FileZilla

檔案(F) 編輯(E) 檢視(V) 傳輸(T) 伺服器(S) 書籤(B) 說明(H)

主機(H): 使用者名稱(U): lowh 密碼(W): 連接埠(P): 快速連線(Q)

狀態: Retrieving directory listing of "/home/lowh/wd"
狀態: Listing directory /home/lowh/wd
狀態: Directory listing of "/home/lowh/wd" successful
狀態: Retrieving directory listing of "/home/lowh/wd"...
狀態: Listing directory /home/lowh/wd
狀態: Directory listing of "/home/lowh/wd" successful

本地站台: C:\Users\Weihsang\Desktop\待上傳區\

遠端站台: /home/lowh/wd

7. 進入 FileZilla 再次確認 RData 是否存在!

| 檔案名稱 | 檔案大小 | 檔案類型 | 最後修改時間 | 權限 | 擁有人/群組 |
|-----------|------|--------|---------------------|----|--------|
| .. | | | | | |
| testSSH.R | 70 | R File | 2015/8/12 上午 10:... | | |

1 個檔案, 總共大小: 70 Byte

| 檔案名稱 | 檔案大小 | 檔案類型 | 最後修改時間 | 權限 | 擁有人/群組 |
|-------------------|-----------|----------------|---------------------|------------|-----------|
| .. | | | | | |
| 3P Sampling | | File folder | 2015/8/12 下... | drwx----- | lowh lowh |
| comparative study | | File folder | 2015/8/12 上... | drwxr-xr-x | lowh lowh |
| testSSH.R | | R File | 2015/8/12 上午 10:... | -rw-r--r-- | lowh lowh |
| FIRST_test.RData | 62 | RDATA File | 2015/8/12 下... | -rw-r--r-- | lowh lowh |
| FIRST_test.Rout | 2,391 | ROUT File | 2015/8/12 下... | -rw-r--r-- | lowh lowh |
| FS_R.csv | 5,622,658 | Microsoft E... | 2015/7/30 下... | -rw-r--r-- | lowh lowh |
| testSSH.R | 247 | R File | 2015/8/12 下... | -rw-r--r-- | lowh lowh |

4 個檔案與 3 個目錄, 總共大小: 5,625,358 Byte

P.S. 若無 RData 檔案, 可能是未設定輸出路徑, 請根據您的 R code 設定的輸出路徑尋找

等候的檔案 傳輸失敗 傳輸成功

下午 04:00 星期三 2015/8/12

佇列: 空