

AIS&D Center

國立成功大學人工智慧服務暨數據中心

| 平台使用教育訓練 |





AIS&D Center

人工智慧服務暨數據中心

官方網站：<http://aisnd.ee.ncku.edu.tw/>

Service

我們提供的服務



雲端虛擬化服務

虛擬機器VM、容器Container



大數據分析服務

Spark、Spark2、Hadoop、
MongoDB、Zeppelin、Hbase、
RStudio、Solr



AI運算服務

Nvidia GPU Server(DGX-1)、
Nvidia GPU(Container)

本次教育訓練的重點

1. VPN介紹
2. 如何創建VM
3. 遠端操作介紹
4. Linux介紹
5. 將VM 叢集內的資料傳送到 NFS Server
6. SFTP教學
7. 啟動AI Job
8. Jupyter notebook介紹

VPN介紹

VPN 到大數據 / AI 平台 (for Windows)

- 必要軟體清單：



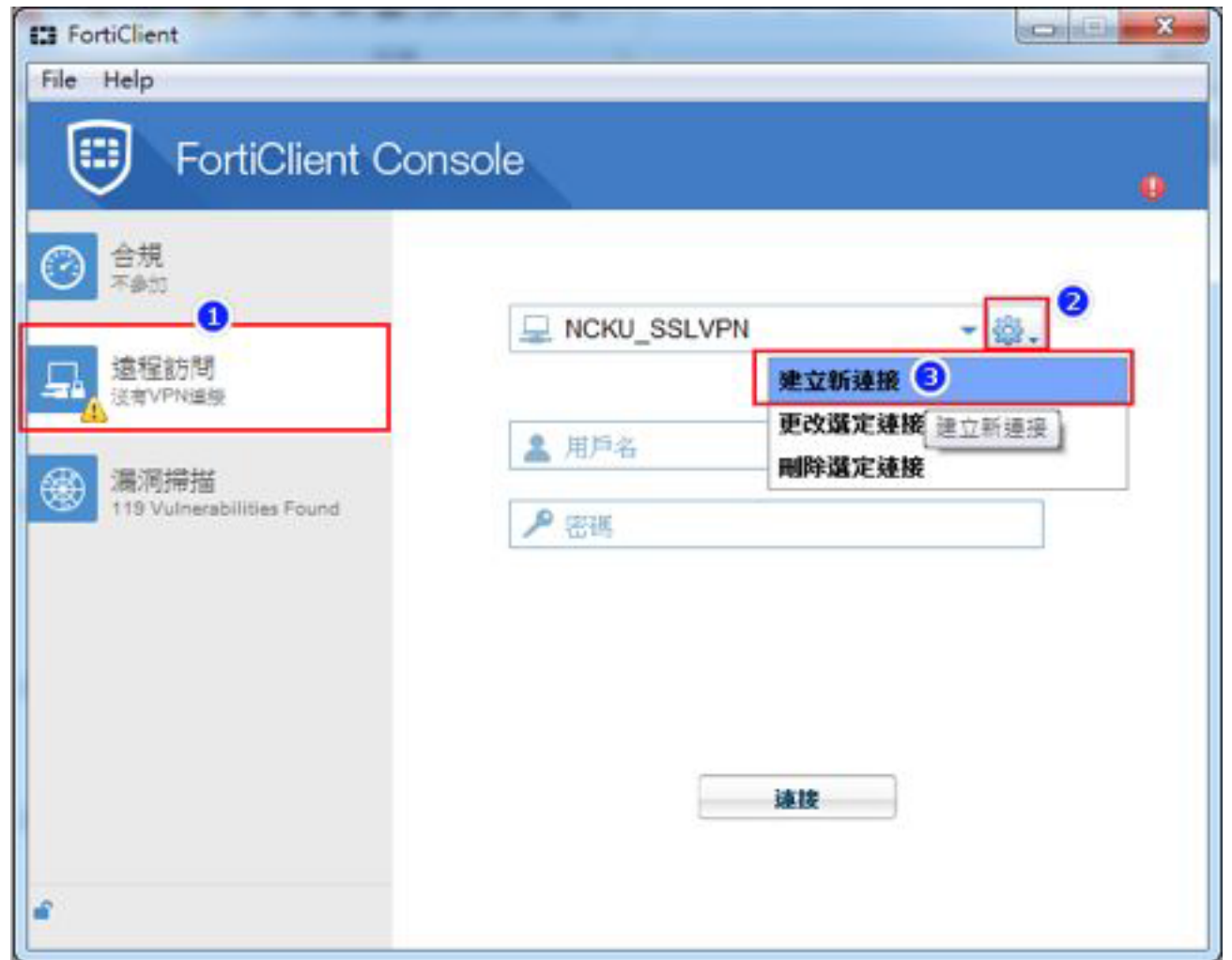
1.1 FortiClient (2017/11/29最新版本為5.6)

=> <https://www.forticlient.com/downloads>

1.2 Windows 7作業系統使用FortiClient 5.6版本，需更新微軟 **KB3033929**

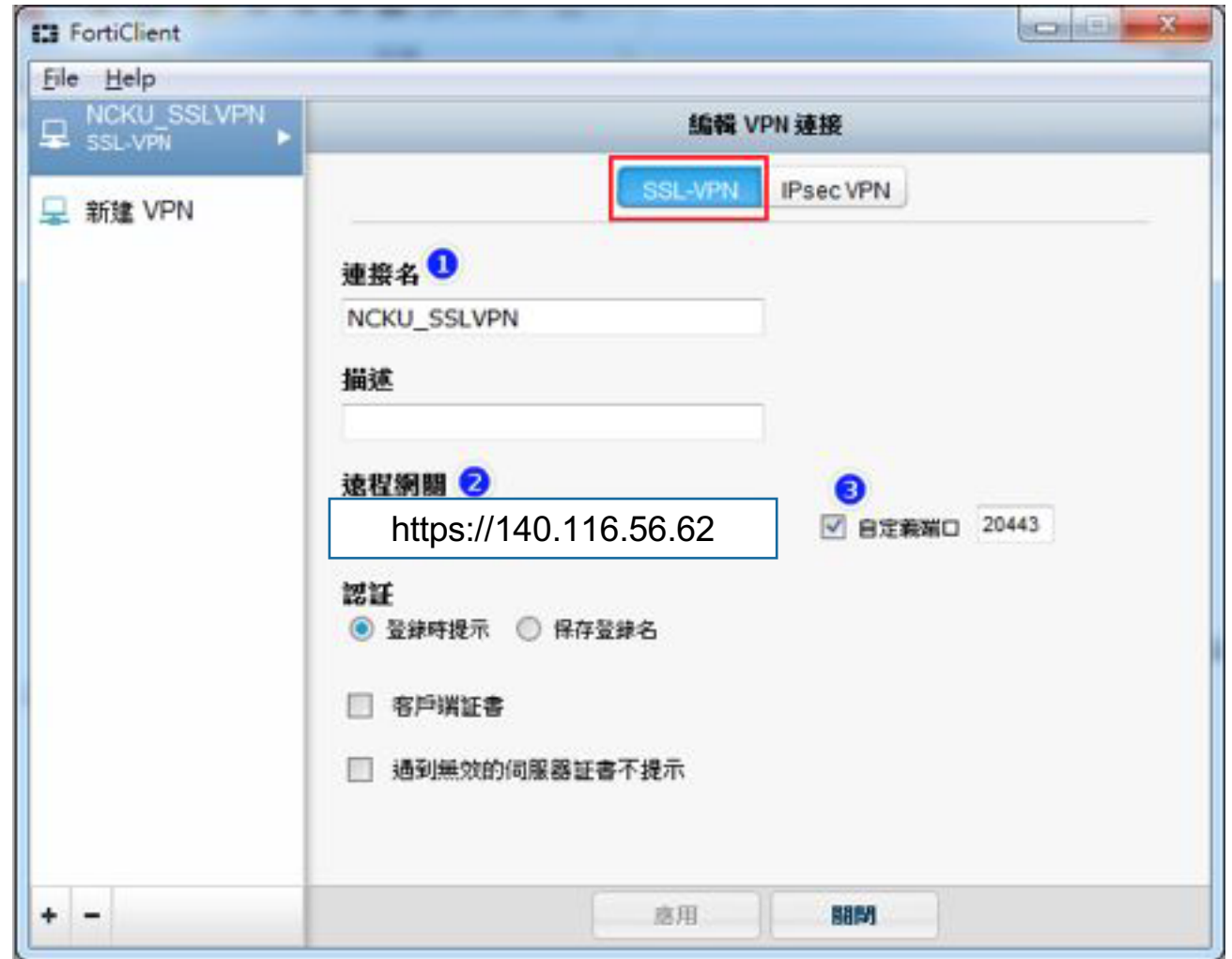
- 64位元下載：<https://www.microsoft.com/zh-TW/download/details.aspx?id=46817>
- 32位元下載：<https://www.microsoft.com/zh-TW/download/details.aspx?id=46078>

遠程訪問 > 設定 > 建立新連結



1. **連接名**: 自取易記憶名稱
2. **描述**: 添加描述, 可留空白
3. **遠程網關**: https://140.116.56.62:20443
勾選自定義端口並輸入 20443

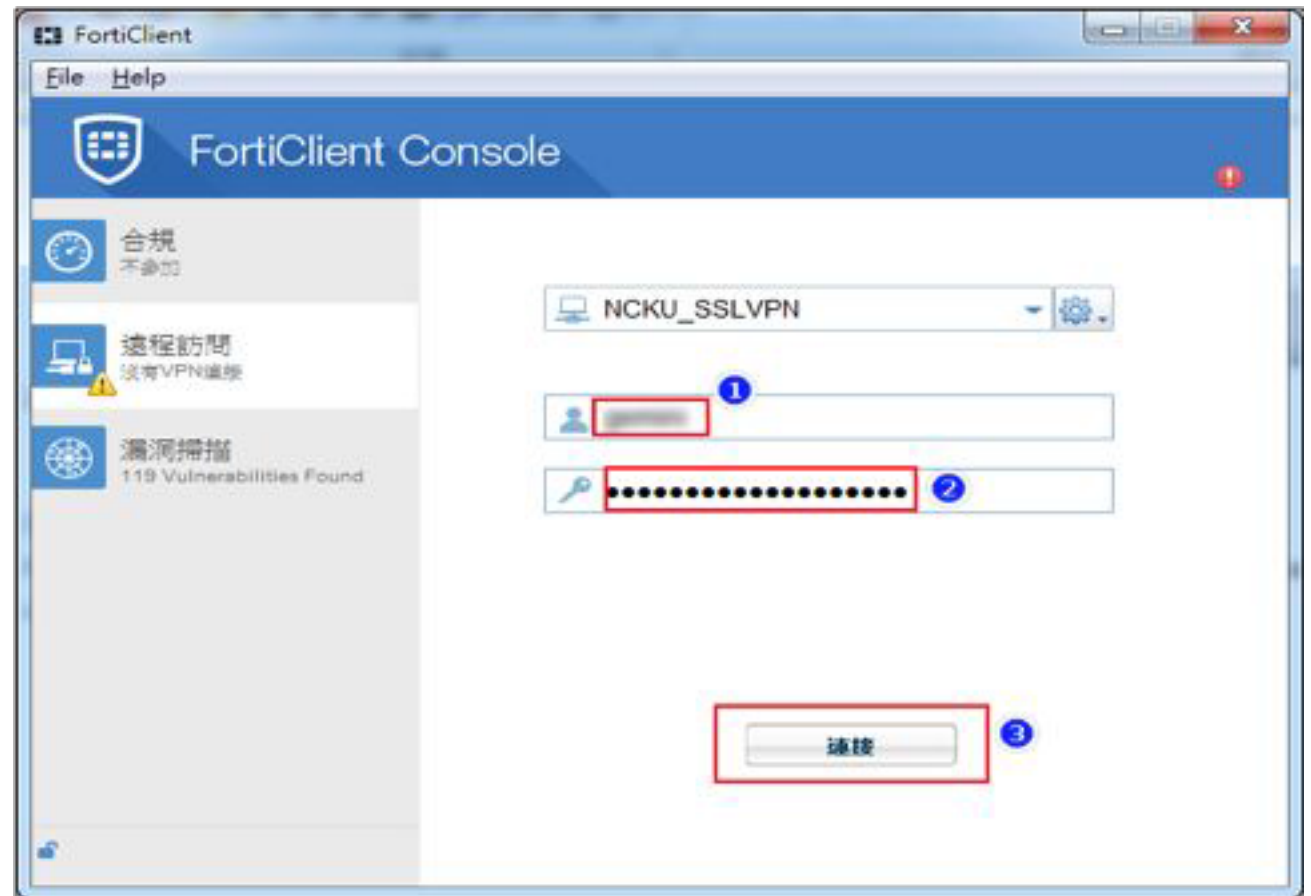
輸入完畢後, 點選 **應用** 即儲存



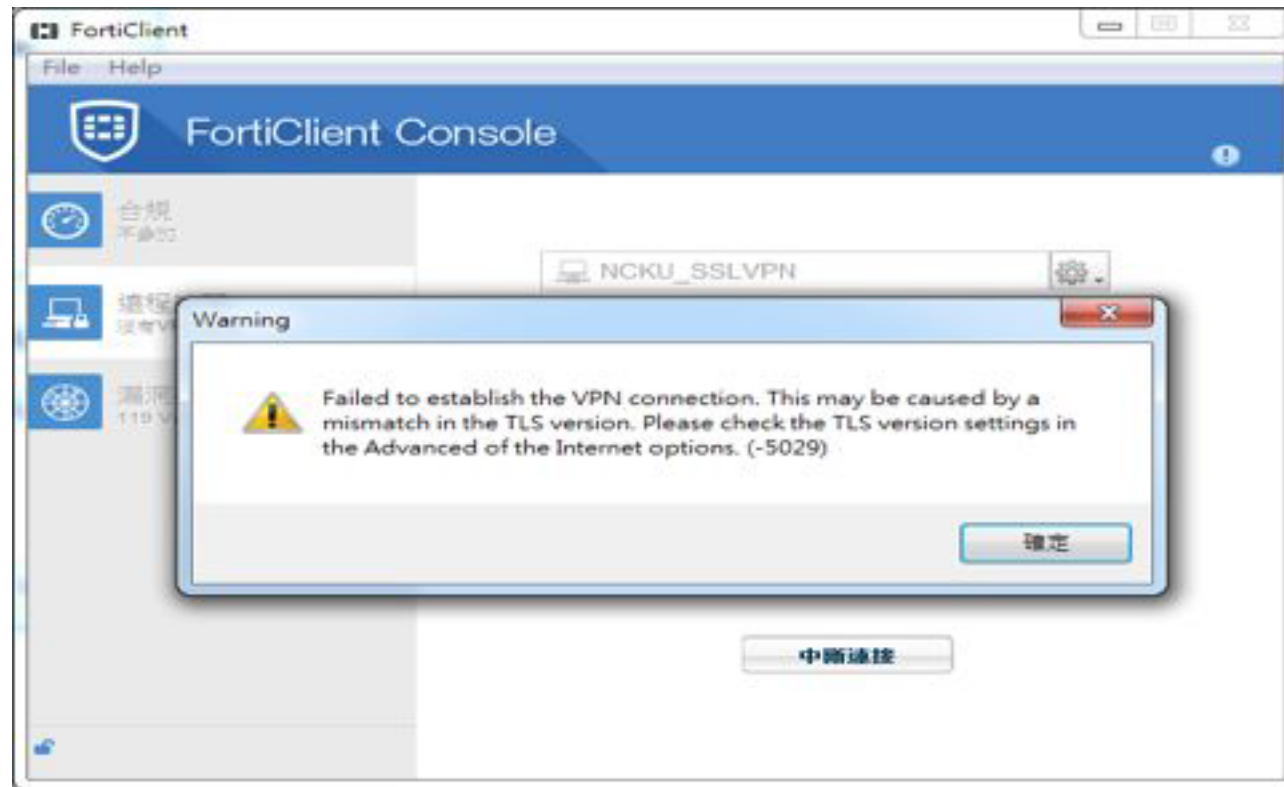
輸入用戶名與密碼，
點選連接即開始連線SSL VPN

account:guest

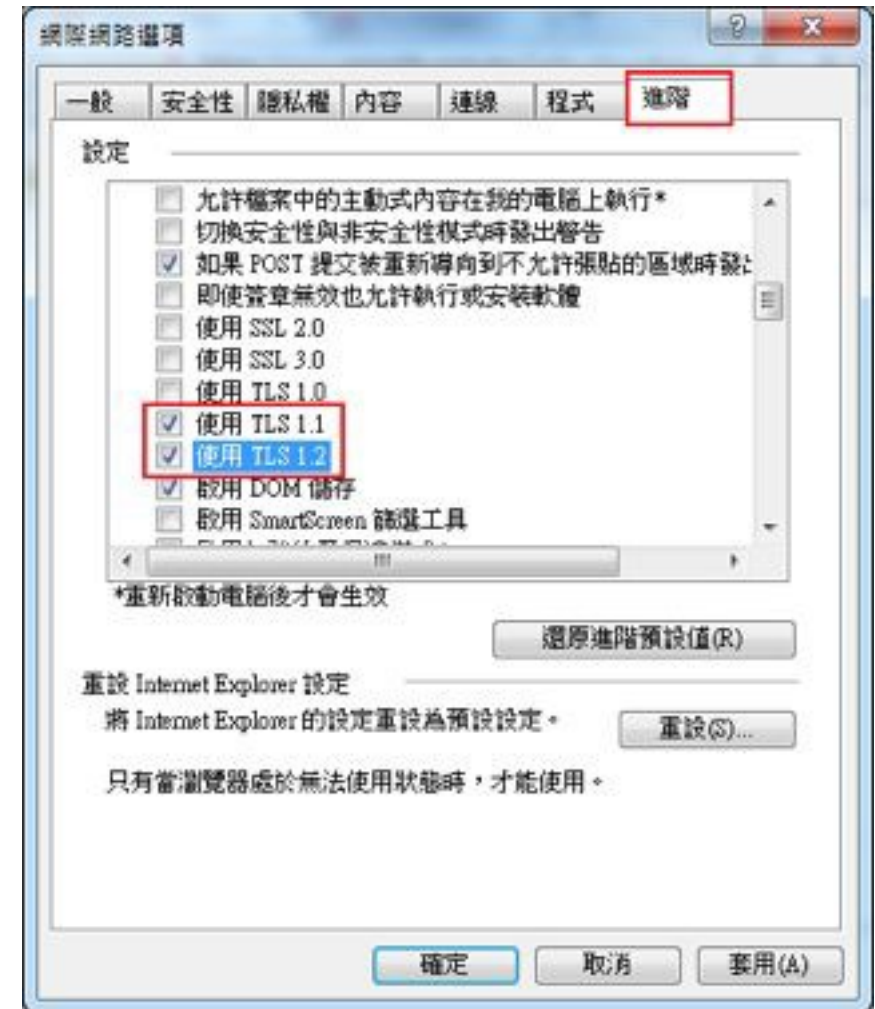
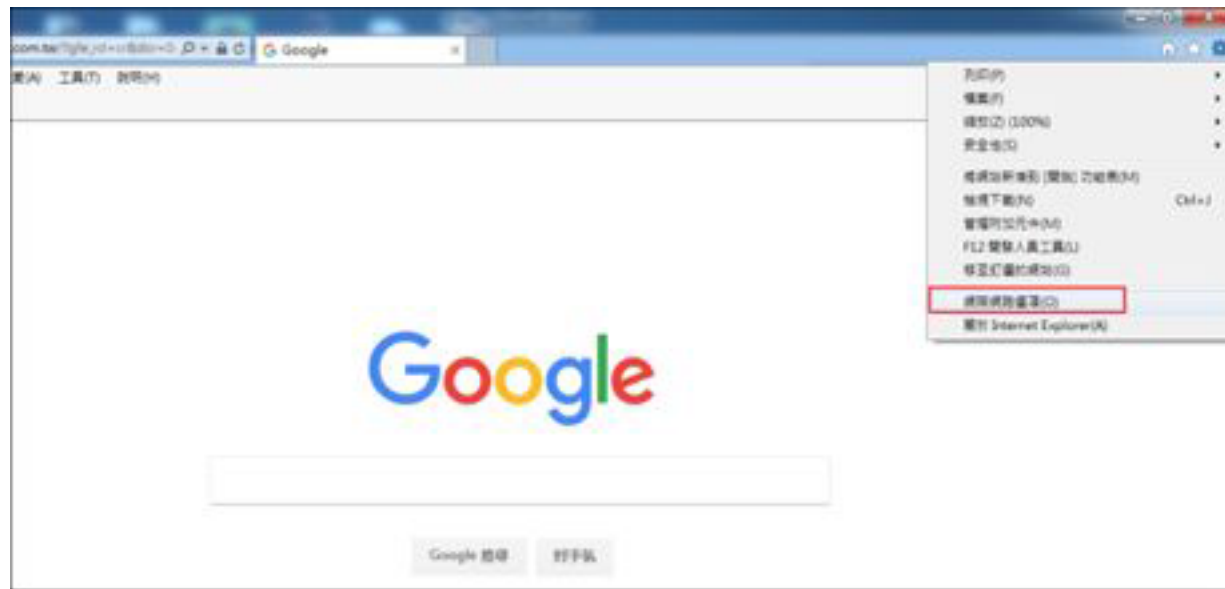
password:aisnd



若SSL VPN連線建立時，
出現錯誤訊息



IE > 工具 > 網際網路選項 > 進階 標籤頁，勾選 TLS 1.1 & TLS 1.2

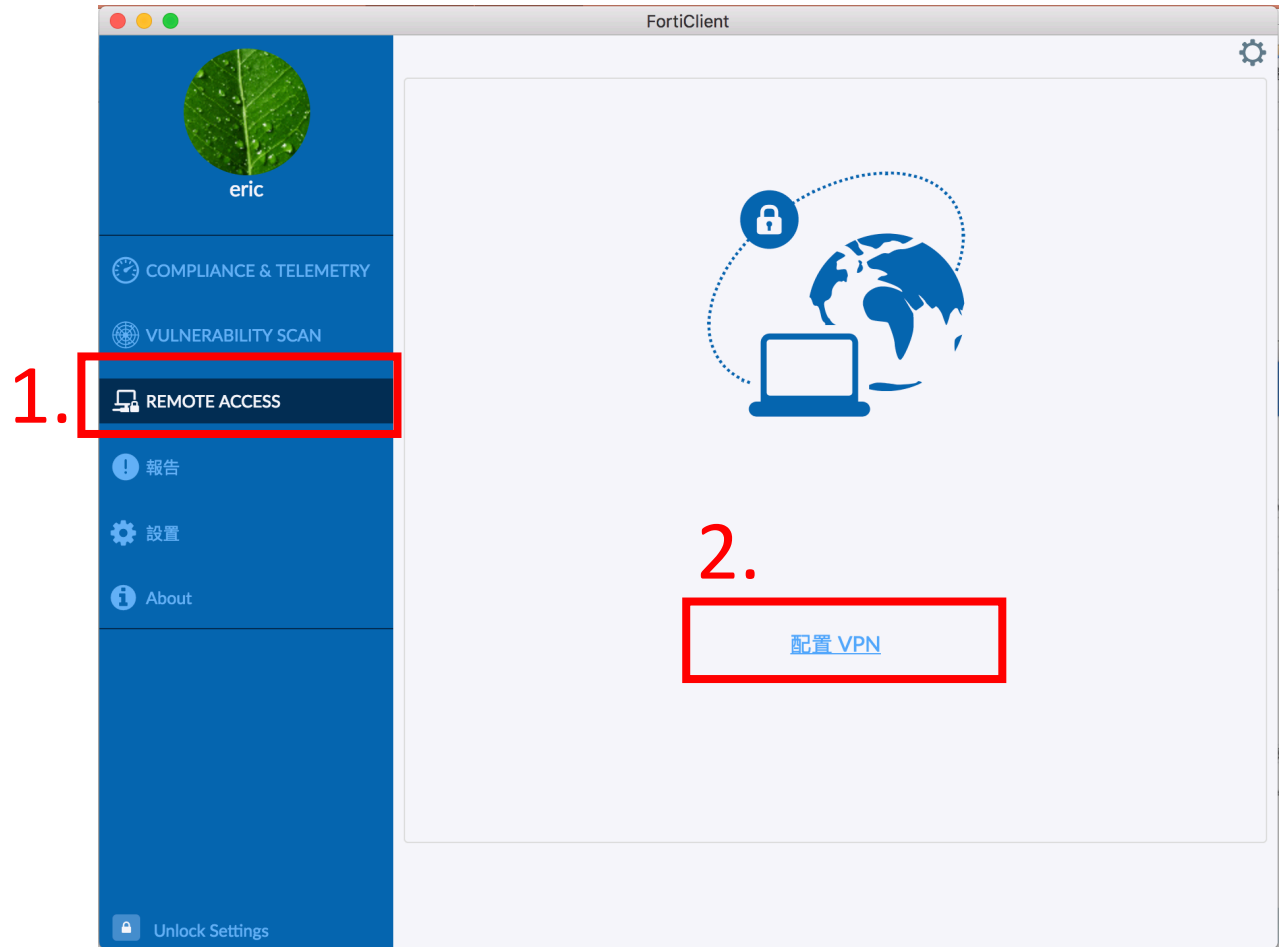


VPN 到大數據 / AI 平台 (for MacOS)

必要軟體：

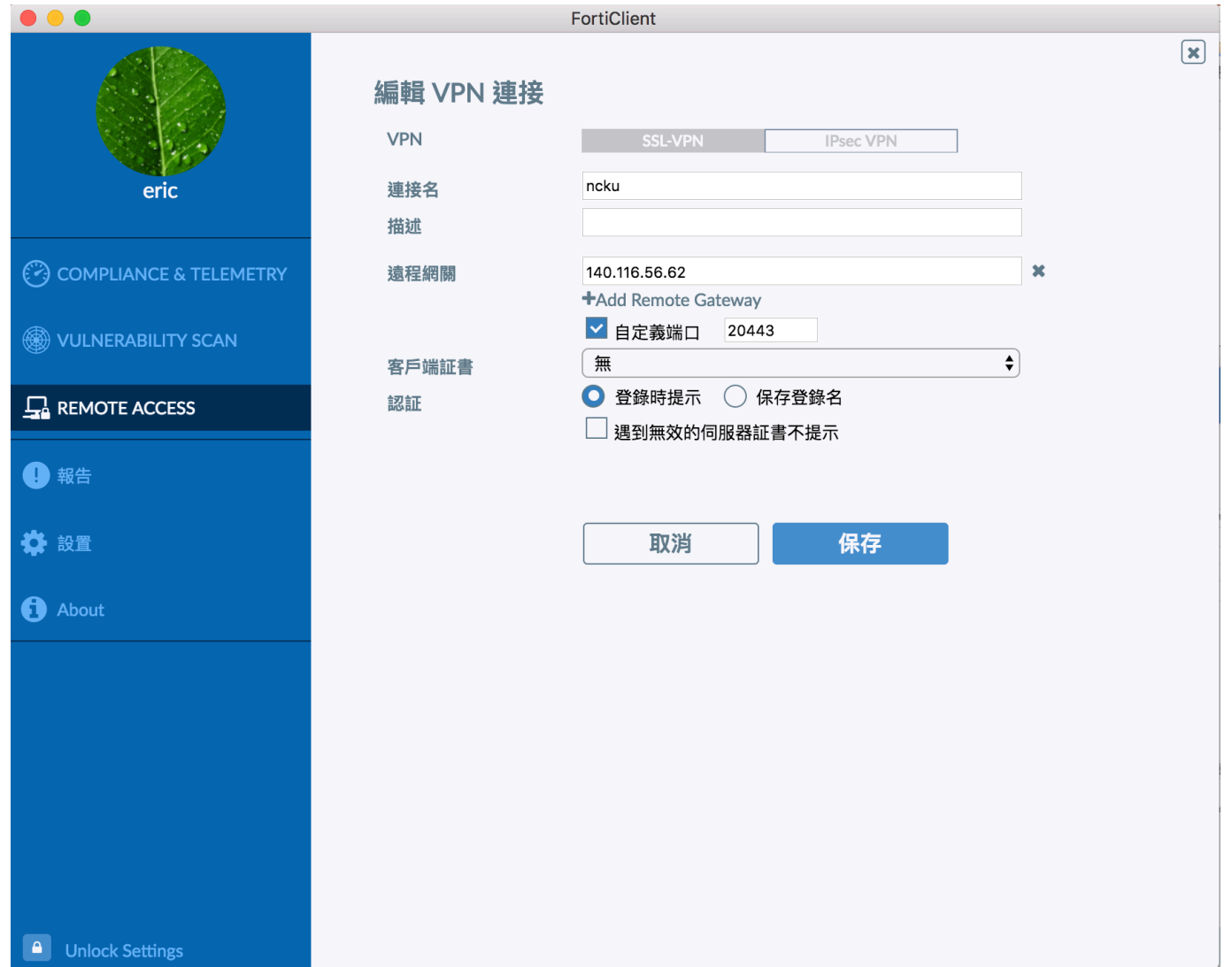
FortiClient (2018/08/29最新版本為6.0)

REMOTE ACCESS > 配置 VPN



1. **連接名**：自取易記憶名稱
2. **描述**：添加描述，可留空白
3. **遠程網關**：<https://140.116.56.62>
勾選自定義端口並輸入 20443

輸入完畢後，點選**增加**即儲存

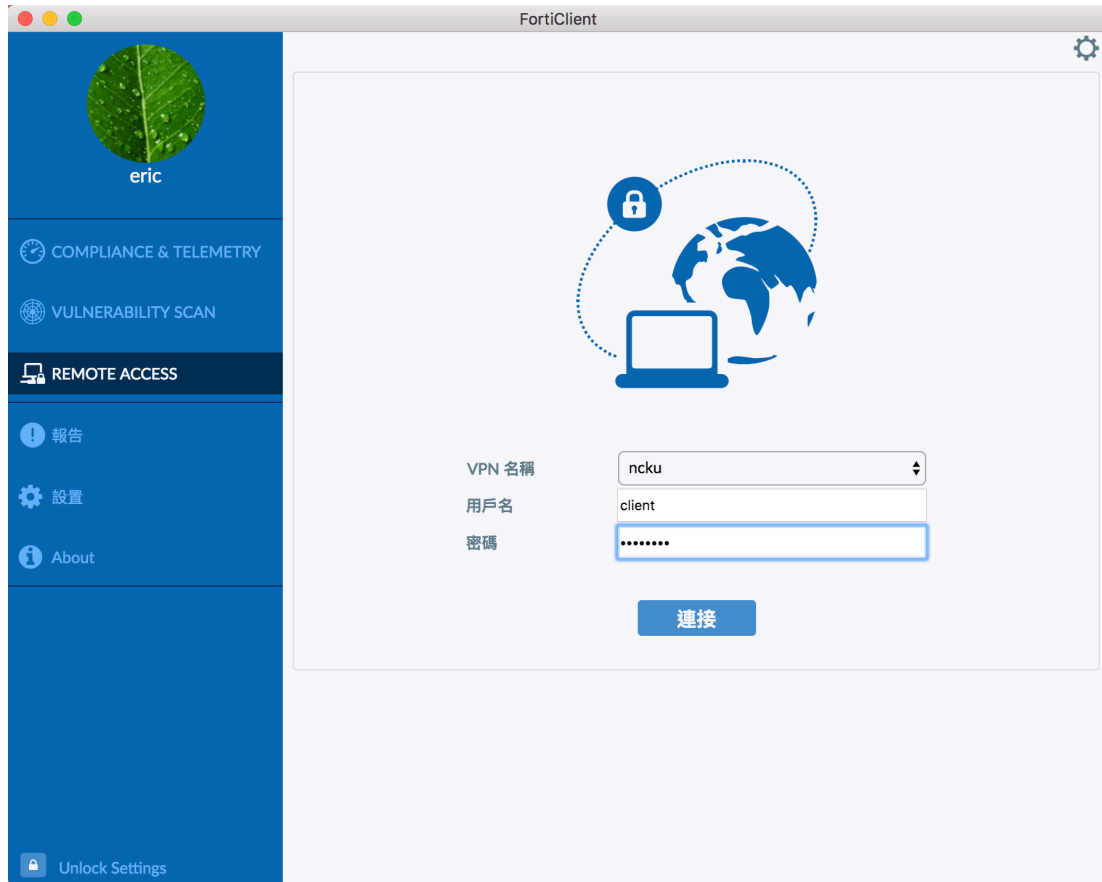


The screenshot shows the FortiClient interface for editing a VPN connection. The window title is "FortiClient". On the left, there is a sidebar with a user profile "eric" and navigation options: COMPLIANCE & TELEMETRY, VULNERABILITY SCAN, REMOTE ACCESS (highlighted), 報告, 設置, About, and an Unlock Settings button at the bottom. The main area is titled "編輯 VPN 連接" and has two tabs: "SSL-VPN" (selected) and "IPsec VPN". The configuration fields are as follows:

- VPN**: SSL-VPN (selected)
- 連接名**: ncku
- 描述**: (empty)
- 遠程網關**: 140.116.56.62 (with a close icon)
- +** Add Remote Gateway
- 自定義端口**: (checked) 20443
- 客戶端證書**: 無
- 認證**: 登錄時提示 保存登錄名
 遇到無效的伺服器證書不提示

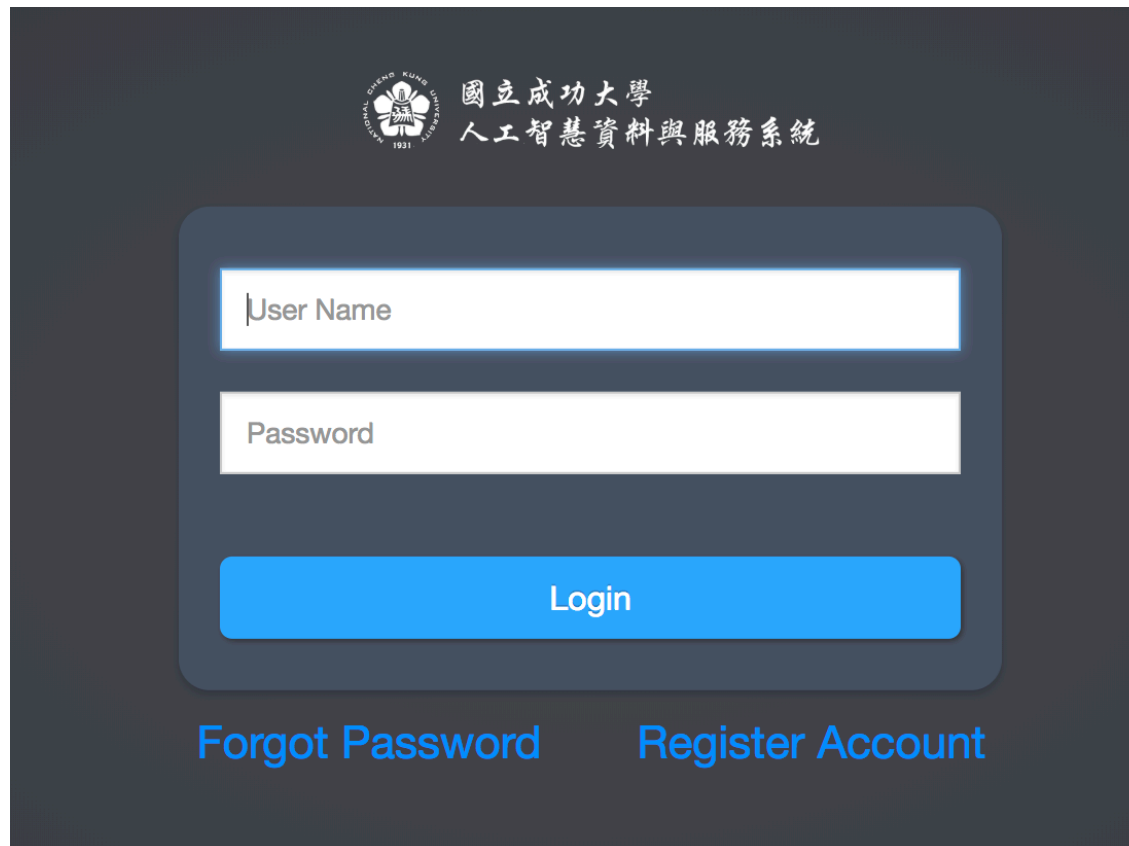
At the bottom right, there are two buttons: "取消" (Cancel) and "保存" (Save).

輸入用戶名與密碼，點選連接即開始連線SSL VPN



如何創建VM

訪問IP：10.12.11.165 (教育訓練用)




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人工智慧資料與服務系統


User Name


Password


Login

[Forgot Password](#) [Register Account](#)

 IaaS V1

 BDaaS

 DGX1Server

 JupyterTF

Service List

Notification 34

@gmail.com

Home / IaaS V1 / Service List

[Delete Service](#) [Start Service](#) [Stop Service](#)


2.

[+ Launch Service](#)

<input type="checkbox"/>	Service Name	Machine Status	Service Status	Public IP	Created By	Create Time	Share
<input type="checkbox"/>	eric-EDx	Ready	Ready	10.12.11	@gmail.com	2018/02/21 17:55:30	No
<input type="checkbox"/>	eric-Demo	Ready	Ready	10.12.11	@gmail.com	2018/02/22 16:49:43	No
<input type="checkbox"/>	eric-Docker	Ready	Ready	10.12.11	@gmail.com	2018/03/13 08:58:24	No
<input type="checkbox"/>	openNFS	Ready	Ready	10.12.11	@gmail.com	2018/08/29 15:12:15	No

Showing 1 to 4 of 4 entries

Previous **1** Next entries

 Report



Service Name * ⓘ

Description

Flavor *

Image *

Number of Machines *

Login Account * ⓘ

Login Password * ⓘ

Confirm Login Password *

Share to ...

Vm名稱

VM的資源大小
(請選擇最低配置)

選擇VM環境

請選擇1

User的帳號

User的密碼

創立完成後，可以先複製IP，
之後遠端操作會需要此IP位置

<input type="checkbox"/>	Service Name	Machine Status	Service Status	Public IP	Created By	Create Time	Share
<input type="checkbox"/>	chouTest	Ready	Ready	10.12.11. [redacted]	[redacted]@mail.ncku.edu.tw	2018/04/11 13:33:29	No

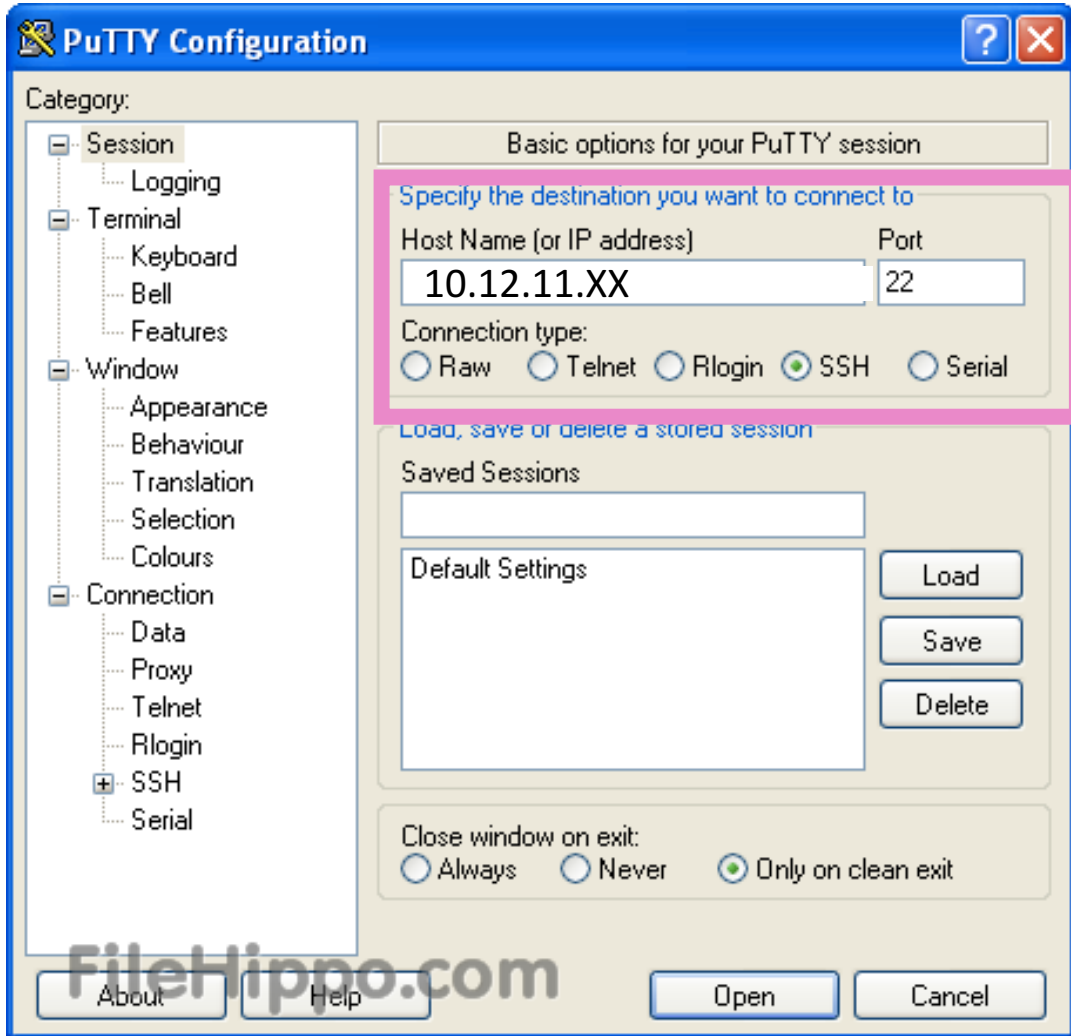
遠端操作介紹

Putty (For window)

- 在window的系統上，需要下載putty才能操作VM

<https://www.putty.org/>





Putty設定

- Host Name:請填寫剛剛複製的VM IP
- Port:請填寫22
- Connection type:SSH

Linux Ubuntu 檔案系統

根目錄內容

/ dev CPU外圍的硬體資訊。

/ etc 系統配置文件。

/ home 一般用戶的主目錄。

/ mnt 外部檔案系統的掛載點。

/ root 超級使用者的主目錄。

/ tmp 系統使用的臨時空間，重啟後清理，
所以不要用它來保存任何工作！

/ usr 所有用戶相關的應用程式、文件、檔案庫等。

/ var 存儲用戶創建的所有變量文件和臨時文件。

```
/
├── bin
├── boot
├── dev
├── etc
├── home
├── initrd.img -> boot/initrd
├── lib
├── lib64
├── lost+found
├── media
├── mnt
├── opt
├── proc
├── root
├── run
├── sbin
├── srv
├── sys
├── tmp
├── upload
├── usr
├── var
└── vmlinuz -> boot/vmlinuz-3
```

Linux Ubuntu 指令簡介



- ls : 列出當前目錄的所有東西。
- ls -a 、 ll : 列出當前目錄的詳細資料。
- cd : 切換目錄。 `cd ~` 切換到使用者家目錄
- sudo : 暫時取得超級使用者權限。
`sudo apt-get update` , apt-get需要超級使用者權限
- apt-get update : 確認目前有哪些套件可以安裝。
- apt-get install : 安裝套件。
`sudo apt-get install nfs-kernel-server` , 安裝NFS Server
- mkdir : 創建資料夾。 `mkdir ~/mydir` , 在家目錄創建mydir資料夾
- vim : 文字編輯器 , 修改或創建檔案。
`vim ~/mydir/test.txt` , 在mydir目錄裡創建txt檔
- chmod : 修改檔案或目錄權限。
`sudo chmod 777 ~/mydir/test.txt` , 把test.txt設為任何人都可以存取



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將VM 叢集內的資料傳送到 NFS Server

NFS Server Install

1. 使用遠端連線(SSH)進入VM環境，
2. 登入VM帳號與密碼
3. 更新download tool

```
sudo apt-get update
```

4. 安裝 nfs server

```
sudo apt-get install nfs-kernel-server
```

5. 創建資料夾

```
sudo mkdir /home/account
```

6. 更改目錄權限，777 為可讀、寫、執行

```
sudo chmod 777 /home/account
```

7. 執行編輯

```
sudo vim /etc/exports
```

8. 進入檔案後按 i 開始編輯，並在檔案下方加入下面指令

```
/home/account *(rw,sync,no_root_squash,no_subtree_check)
```

- /home/account *(rw,sync,no_root_squash,no_subtree_check)
- * 代表所有網段都可以連接，也可以指定 IP
- rw：接此目錄的客戶端對該共享目錄具有讀寫權限
- sync：資料同步寫入記憶體和硬碟
- No_root_squash：客戶端用root訪問該共享文件夾時，不對應 root 用戶，實際使用匿名。
- no_subtree_check：不檢查父目錄的權限

9. 編輯完成後，按下ESC，之後按下:，輸入qw存檔跳出。

10. 重新啟動 nfs server

```
sudo service nfs-kernel-server restart
```

11. 確認此目錄有被開啟

```
showmount -e
```



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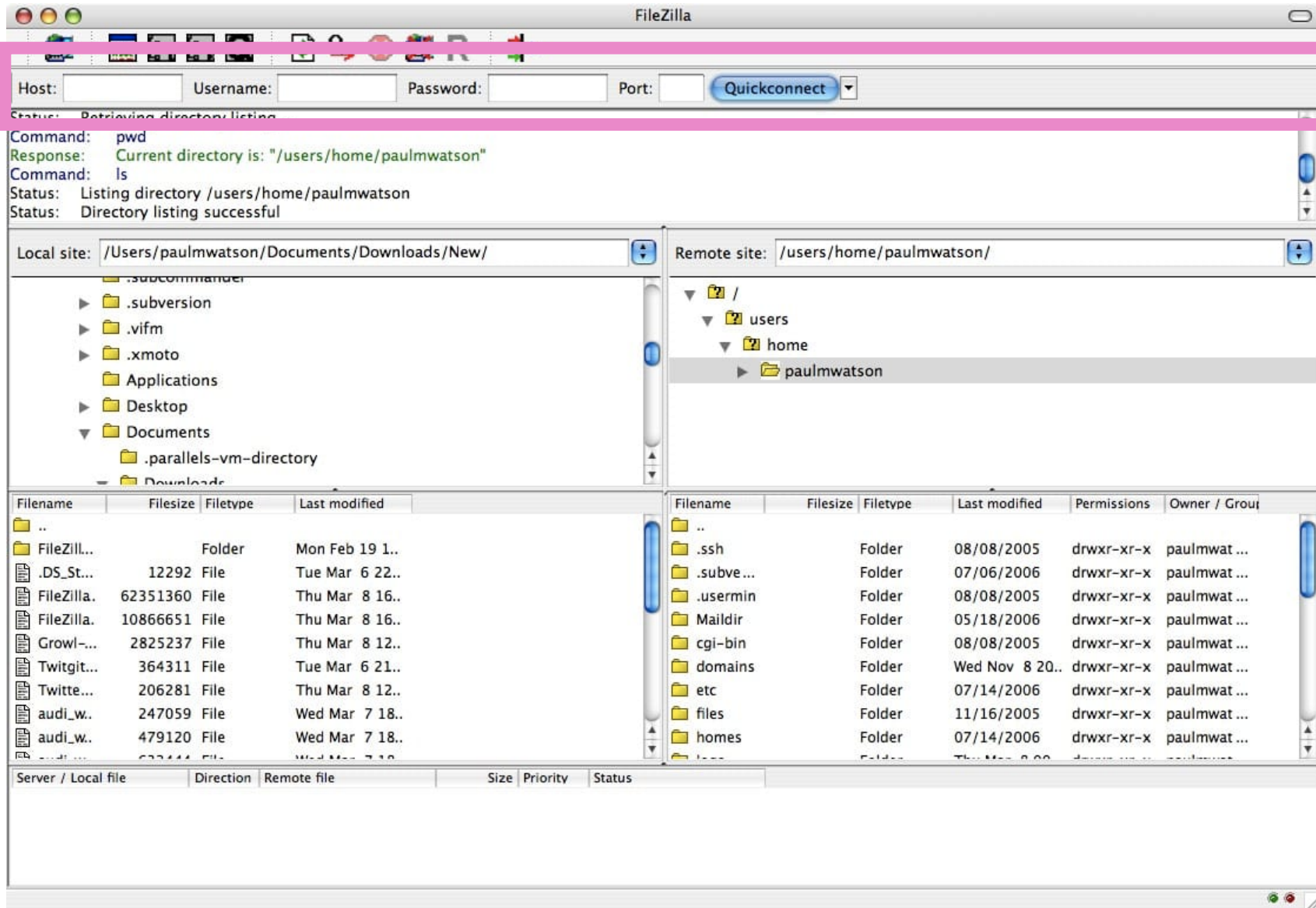
sFTP教學



FileZilla



- 當有資料需要從本機上傳至VM時，請使用FileZilla這套軟體上傳



- Host:VM的IP位置
- Username:創建VM時所設定的user帳號
- Password:創建VM時所設定的user密碼
- Port:22

啟動AI Job

於10.12.11.94登入後，
選擇AI服務DGX1Server

account: aisnd@incku.com/
Password: ncku_aisnd



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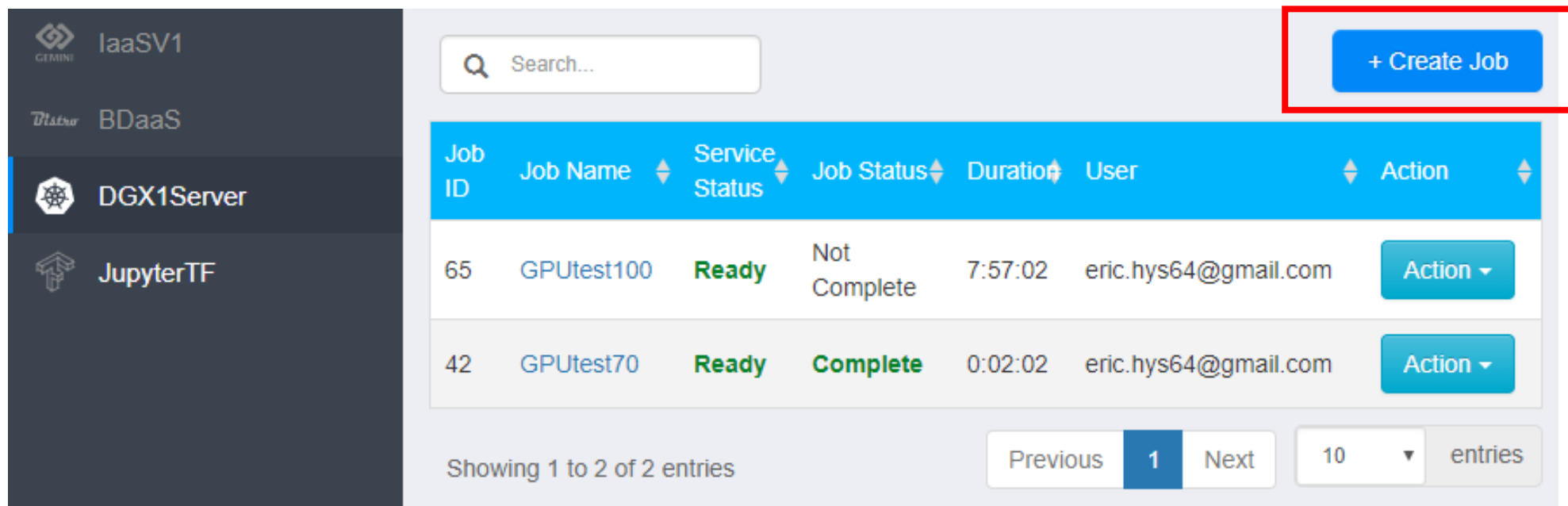
Home / DGX1Server

Search...

Job ID	Job Name
42	GPUte

Showing 1 to 1 of 1

新建Job



The screenshot displays a web interface for managing jobs. On the left is a dark sidebar with four service options: **iaaSV1** (GEMINI), **BDaaS** (Distur), **DGX1Server**, and **JupyterTF**. The main area features a search bar, a table of jobs, and a '+ Create Job' button highlighted with a red box. The table lists two jobs with columns for Job ID, Job Name, Service Status, Job Status, Duration, User, and Action.

Job ID	Job Name	Service Status	Job Status	Duration	User	Action
65	GPUtest100	Ready	Not Complete	7:57:02	eric.hys64@gmail.com	Action ▾
42	GPUtest70	Ready	Complete	0:02:02	eric.hys64@gmail.com	Action ▾

Showing 1 to 2 of 2 entries

Previous 1 Next 10 ▾ entries

範例程式

```
import tensorflow as tf
import platform

a = tf.constant([1.0, 2.0, 3.0, 4.0, 5.0, 6.0], shape=[2, 3], name='a')
b = tf.constant([1.0, 2.0, 3.0, 4.0, 5.0, 6.0], shape=[3, 2], name='b')
c = tf.matmul(a, b)
sess = tf.Session(config=tf.ConfigProto(log_device_placement=True))

a = sess.run(c)

f = open("/home/account/endfile.txt", "w")
f.write(str(a)+"\n"+tf.__version__)
f.close()
```

- 特別注意的設定問題

(1) NFS Server路徑

(2) Command

(3) Args(要用絕對路徑)

如果mount到/home/account這個資料夾

Args就一定要以/home/account開頭

- 注意

Create AI job是使用image:

tensorflow:latest-gpu

Create Jupyter notebook是使用image:

tensorflow-jupyter:latest

Job Name * 

sample

GPU Count *

1

Image *

Default Registry Public Registry

ncku_aisnd/tensorflow:latest-gpu

Mount NFS *

10.12.11.254

/home/account

Mount Point in Container *

/home/account

Command

python

Args

/home/account/test.py

Description

Launch

Cancel

Image的部分

可以使用docker Hub上的資源
填寫時請依照此格式image:Tag
Tag部分為必填

Job Name * 

test

GPU Count *

1

Image *

Default Registry Public Registry

nvidia/caffe:0.14

Mount NFS *

10.12.11.125

/home/account

Mount Point in Container *

/home/account

Command

python

Args

/home/account/test.py

Description

Launch

Cancel

Job初始化

Duration(執行時間)
成功後會顯示正確的執行時間

Search... + Create Job

Job ID	Job Name	Service Status	Job Status	Duration	User	Action
65	GPUtest100	Ready	Not Complete	7:57:02	eric.hys64@gmail.com	Action ▾

- 1. NFS Server路徑錯誤
- 2. 程式碼錯誤
- 3. 執行的cmd路徑錯誤

Running: The Pod has already finished executing Init Containers.

Completed: The job is completed.

ContainerCreating: The Container is creating

Error: An Init Container has failed to execute.

ImagePullBackOff: The Pod image is downloading.

ErrImagePull: Download Pod image failed.

Pending: The Pod has not yet begun executing Init Containers.

CrashLoopBackOff: An Init Container has failed repeatedly.

OOMKilled: The memory is not enough for this job.

ContainerCannotRun: The service in container can not run.

Job Debug

try:

你的程式碼

except Exception as e:

```
import traceback
```

```
error_msg = traceback.format_exc()
```

```
f = open("/home/account/error.txt", "w")
```

```
f.write(str(error_msg))
```

```
f.close()
```

運算成功

Search...

+ Create Job

這個Job用了2分2秒的運算時間

Job ID	Job Name	Service Status	Job Status	Duration	User	Action
42	GPUtest70	Ready	Complete	0:02:02	eric.hys64@gmail.com	Action ▾

Showing 1 to 1 of 1 entries

Previous 1 Next 10 ▾ entries

運算成功

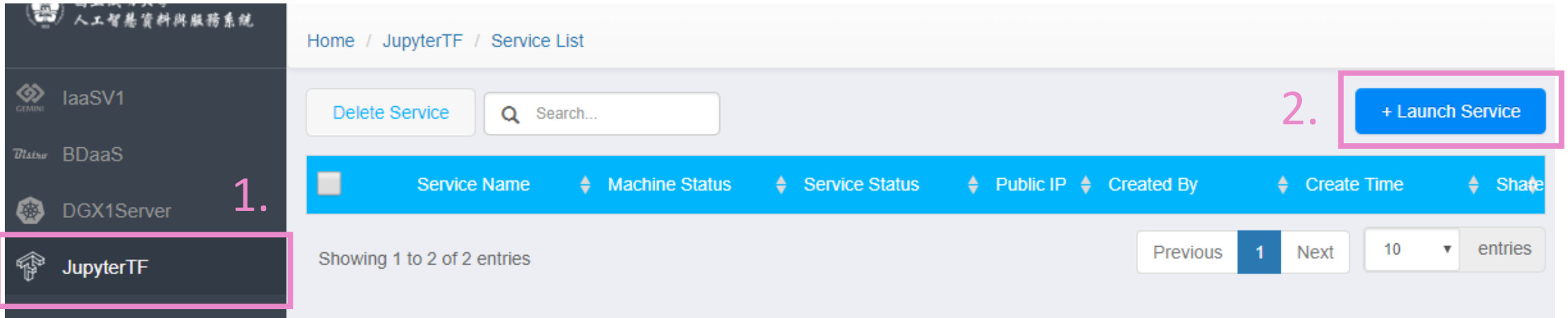


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Jupyter notebook介紹

JupyterTF Service List



Home / JupyterTF / Service List

Delete Service Search...

2. + Launch Service

1.

Service Name	Machine Status	Service Status	Public IP	Created By	Create Time	Share
Showing 1 to 2 of 2 entries						

Previous 1 Next 10 entries

AI Service IP: <https://10.12.11.94>

Setting

Service Name * 

ericp2

Container名稱

Description

Image *

Container Image

ncku_aisnd/tensorflow-jupyter:latest

Mount NFS * 共用NFS Server IP

分享的資料夾路徑


10.12.11.125

/upload/jupyter

Mount Point in Container *

/notebooks/data

Mount 到container裡的路徑

Jupyter Password * 

1qaz1qaz

設定 jupyter 的登入密碼

Launch

Cancel

這邊的路徑是大家共用
在你還沒架設NFS Server時可以暫時使用

注意 放在裡面的資料是任何人都可以看到的

Setting

可以直接覆蓋整個資料夾
這樣產生在此目錄的任何檔案
都會放到你的NFS裡

Service Name * ⓘ

ericp2

Container名稱

Description

Image *

Container Image

ncku_aisnd/tensorflow-jupyter:latest

Mount NFS * 你的NFS Server IP

分享的資料夾路徑

10.12.11.125

/upload/jupyter

Mount Point in Container *

/notebooks

Mount 到container裡的路徑

Jupyter Password * ⓘ

1qaz1qaz

設定 jupyter 的登入密碼

Launch

Cancel

取得Jupyter服務網址

Delete Service [+ Launch Service](#)

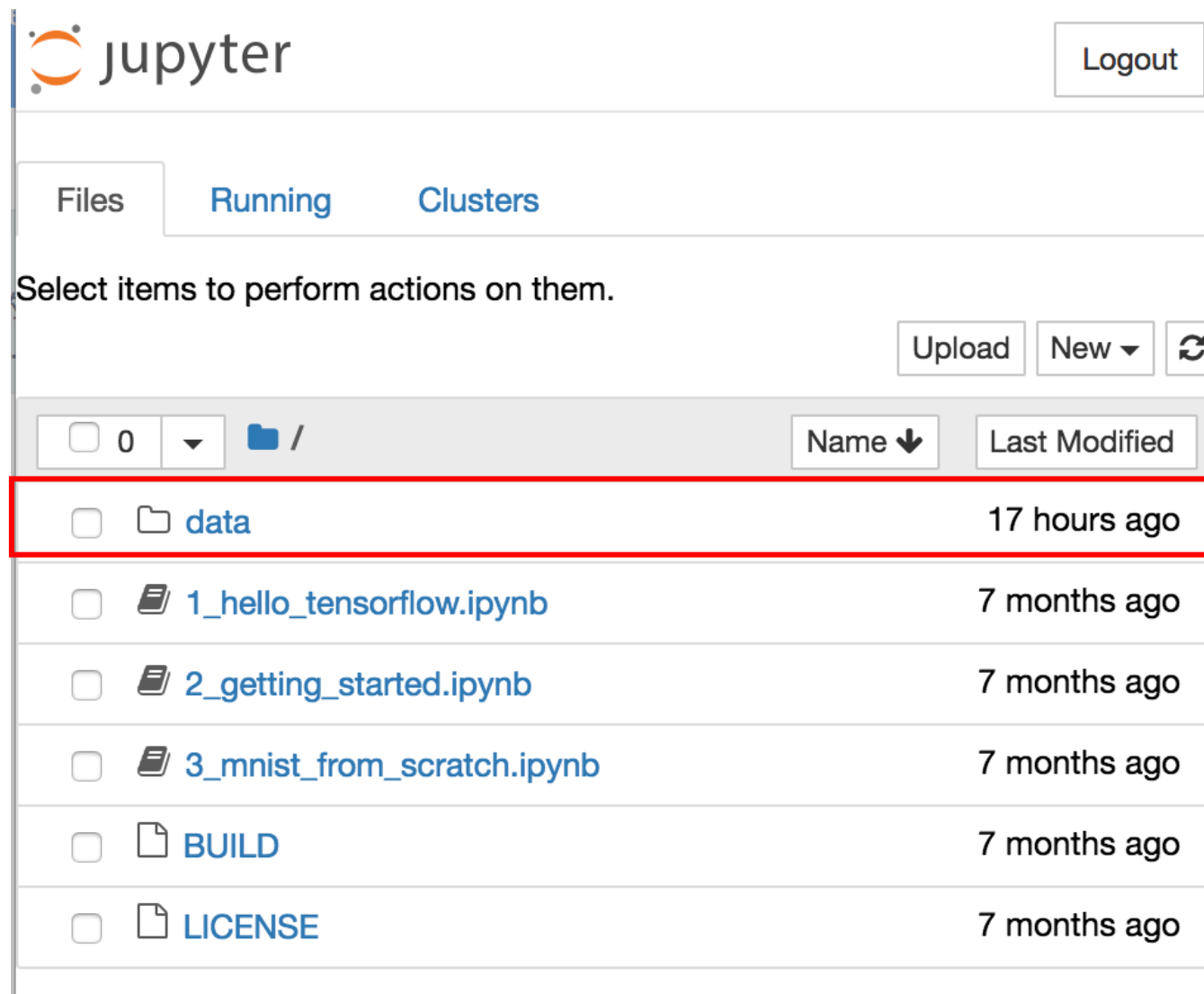
<input type="checkbox"/>	Service Name	Machine Status	Service Status	Public IP	Created By	Create Time	Share
<input type="checkbox"/>	ericTF	Ready	Ready	10.12.254.1:32285	eric.hys64@gmail.com	2018/03/05 10:53:22	No

Showing 1 to 1 of 1 entries

Jupyter 服務網址 [Previous](#) **1** [Next](#) [entries](#)

TF 基本範例介紹

這個資料夾就是剛剛mount的NFS
放在這個資料夾的資料比較不會
因為伺服器更新或服務備援轉移而遺失

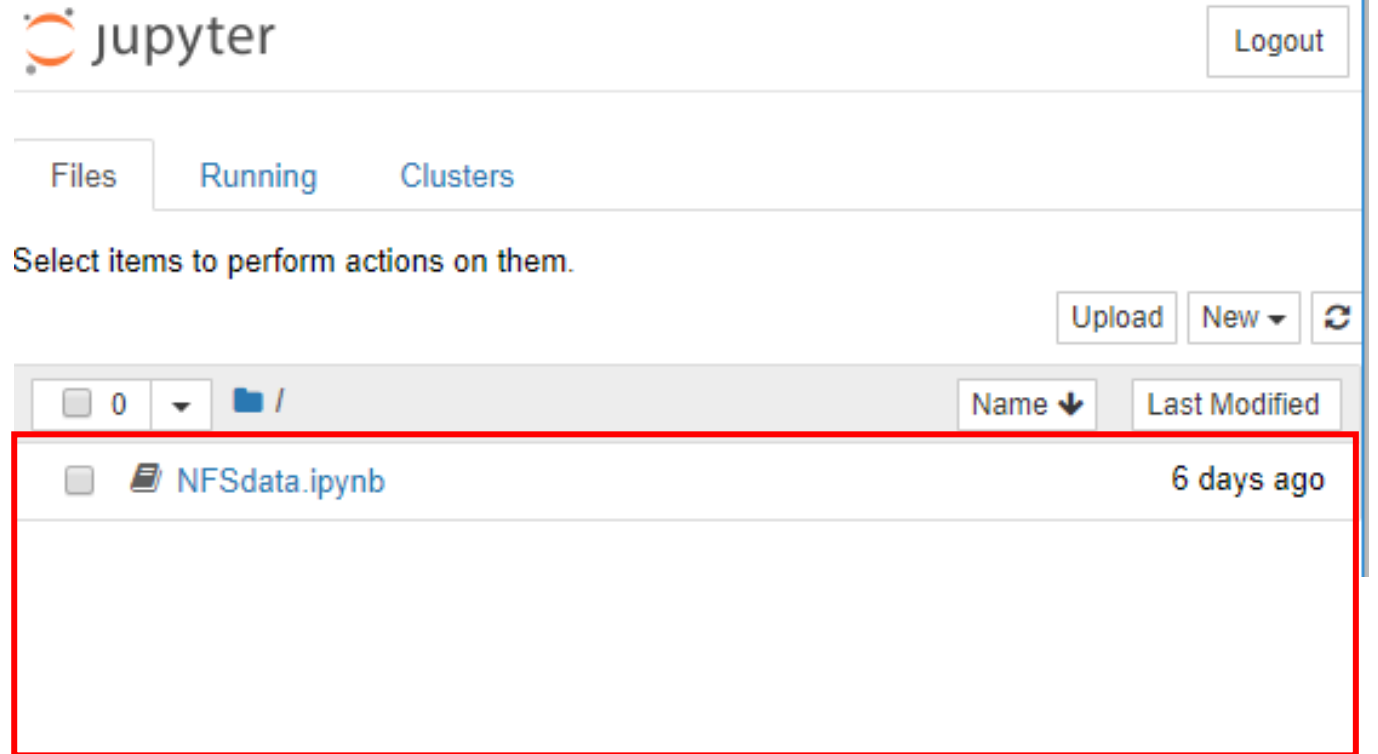


The screenshot shows the JupyterLab interface. At the top left is the Jupyter logo and the word "jupyter". At the top right is a "Logout" button. Below the logo are three tabs: "Files", "Running", and "Clusters". Underneath the tabs is the text "Select items to perform actions on them." To the right of this text are three buttons: "Upload", "New" (with a dropdown arrow), and a refresh icon. Below these buttons is a table with columns for "Name" and "Last Modified". The table contains the following items:

<input type="checkbox"/>	Name	Last Modified
<input type="checkbox"/>	0 /	
<input type="checkbox"/>	data	17 hours ago
<input type="checkbox"/>	1_hello_tensorflow.ipynb	7 months ago
<input type="checkbox"/>	2_getting_started.ipynb	7 months ago
<input type="checkbox"/>	3_mnist_from_scratch.ipynb	7 months ago
<input type="checkbox"/>	BUILD	7 months ago
<input type="checkbox"/>	LICENSE	7 months ago

TF 基本範例介紹

這個整個範圍就是剛剛mount的NFS
放在的資料會直接移到你的NFS，
比較不會因為伺服器更新或
服務備援轉移而遺失



The screenshot shows the JupyterLab interface. At the top left is the Jupyter logo and the text "jupyter". At the top right is a "Logout" button. Below the logo are three tabs: "Files", "Running", and "Clusters". Underneath the tabs is the instruction "Select items to perform actions on them." To the right of this instruction are three buttons: "Upload", "New" (with a dropdown arrow), and a refresh icon. Below these buttons is a file browser table with two columns: "Name" and "Last Modified". The table contains one entry: a file named "NFSdata.ipynb" with a document icon, and "6 days ago" in the "Last Modified" column. The entire file browser area is highlighted with a red border.



執行程式碼

The screenshot shows a Jupyter Notebook interface. At the top, the title is "jupyter 1_hello_tensorflow". On the right, there is a Python logo and a "Logout" button. Below the title is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, Help. To the right of the menu bar are "Trusted" and "Python 2" indicators. Below the menu bar is a toolbar with icons for saving, adding cells, deleting, copying, pasting, undo, redo, running, and a dropdown menu for "Markdown".

The main content area shows a code cell with the following code:

```
In [0]: from __future__ import print_function

import tensorflow as tf

with tf.Session():
    input1 = tf.constant([1.0, 1.0, 1.0, 1.0])
    input2 = tf.constant([2.0, 2.0, 2.0, 2.0])
    output = tf.add(input1, input2)
    result = output.eval()
    print("result: ", result)
```

The output of the code cell is:

```
result: [ 3.  3.  3.  3.]
```

Below the code cell, there is a text block explaining the code:

What we're doing is creating two vectors, [1.0, 1.0, 1.0, 1.0] and [2.0, 2.0, 2.0, 2.0], and then adding them. Here's equivalent code in raw Python and using numpy:



警告提示

```
jupyter 1_hello_tensorflow Python 2  
File Edit View Insert Cell Kernel Widgets Help Trusted  
+ ↩ ↲ ↳ ↵ ⏪ Run ⏩ ⌂ ↺ ⏹ Markdown  
In [1]: from __future__ import print_function  
  
import tensorflow as tf  
  
with tf.Session():  
    input1 = tf.constant([1.0, 1.0, 1.0, 1.0])  
    input2 = tf.constant([2.0, 2.0, 2.0, 2.0])  
    output = tf.add(input1, input2)  
    result = output.eval()  
    print("result: ", result)  
  
/usr/local/lib/python2.7/dist-packages/h5py/__init__.py:36: FutureWarning: Conversion of the second argument of issubdtype from `float` to `np.floating` is deprecated. In future, it will be treated as `np.float64 == np.dtype(float).type`.  
    from ._conv import register_converters as _register_converters  
  
result: [3. 3. 3. 3.]  
  
What we're doing is creating two vectors, [1.0, 1.0, 1.0, 1.0] and [2.0, 2.0, 2.0, 2.0], and then adding them. Here's equivalent code in raw Python and using numpy:
```



釋放資源

The screenshot shows the JupyterLab interface. At the top left is the Jupyter logo and the text "jupyter". At the top right is a "Logout" button. Below the logo are three tabs: "Files", "Running", and "Clusters". Under the "Running" tab, there are several buttons: "Duplicate", "Shutdown" (highlighted with a pink box), "View", "Edit", and a trash icon. To the right of these buttons are "Upload", "New" (with a dropdown arrow), and a refresh icon. Below the buttons is a breadcrumb navigation bar showing "1" and a folder icon. To the right of the breadcrumb are two dropdown menus: "Name" (with a downward arrow) and "Last Modified". Below the breadcrumb is a table of files. The first row is highlighted with a pink box and contains a checked checkbox, a green notebook icon, the filename "1_hello_tensorflow.ipynb", and the status "Running 5分鐘前". The other rows are: "2_getting_started.ipynb" (checkbox, notebook icon, filename, status "一個月前"), "3_mnist_from_scratch.ipynb" (checkbox, notebook icon, filename, status "一個月前"), "BUILD" (checkbox, document icon, filename, status "一個月前"), and "LICENSE" (checkbox, document icon, filename, status "一個月前").

	Name	Last Modified
<input checked="" type="checkbox"/>	1_hello_tensorflow.ipynb	Running 5分鐘前
<input type="checkbox"/>	2_getting_started.ipynb	一個月前
<input type="checkbox"/>	3_mnist_from_scratch.ipynb	一個月前
<input type="checkbox"/>	BUILD	一個月前
<input type="checkbox"/>	LICENSE	一個月前

Q & A