

架設 AWS

Build an AWS

本教學目的：

手把手，從 0 開始學會架設 AWS，並利用終端機進行遠端操控。

操作步驟流程：

1. 取得 Amazon Web Services 帳戶
2. 設定雲計算 Server
3. 連接個人 Server
4. 結尾：提供 Jupyter Notebook 線上教學連結



Step 1 取得 Amazon Web Services 帳戶

進入 amazon 連結，註冊 AWS 帳戶 (<https://aws.amazon.com/>)

於右上角點選【建立免費帳戶】：



接著，依照畫面，填入個人帳戶資訊。

填寫聯絡資訊，雖顯示中文，但不支援中文輸入，請以英文填寫：

聯絡資訊

所有欄位都必須填寫。

請選擇帳戶類型並透過填寫下列欄位，提供您的詳細聯絡資訊。

帳戶類型

☒ 專業級 ☐ 個人

全名

公司名稱

電話號碼

國家/地區

地址

城市

州省或地區

郵遞區號

☐ 勾選此欄表示您已閱讀並同意 [AWS 客戶協議條款](#)

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輸入付款資訊(可注意【常見問答集】內的付費說明)。AWS 會依照不同設定收取不同費用，當然也有一年免費方案：

付款資訊

請輸入您的付款資訊，以便我們驗證您的身分。我們不會向您收費，除非您的用量超過 [AWS 免費方案限制](#)。檢閱[常見問答集](#)以獲得更多資訊。

信用卡/金融卡號

截止日期

持卡人姓名

帳單地址

☒ 使用我的聯絡地址

☐ 使用新地址

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如果是免費方案，還須特別注意，【常見問答集】裡有說明，帳戶用量超過免費方案，會直接改為付費方式。

常見問答集

什麼是 AWS 免費方案？

AWS 免費方案讓您獲得 AWS 服務的實作體驗，例如 Amazon EC2、Amazon S3 以及 Amazon RDS。AWS 免費方案涵蓋 AWS 註冊日起 12 個月內的免費方案服務，且額外的服務優惠不會在您為期 12 個月 AWS 免費方案結束後自動過期。進一步了解 [AWS 免費方案](#)。

我為什麼需要提供付款資訊？

我們請您提供信用卡或金融卡資訊，以便在帳戶用量超過 AWS 免費方案限制後，直接改為付費使用 AWS 服務。此外也將使用付款資訊來驗證帳戶真偽，以防範詐騙行為。

何時收取費用？

AWS 用量超過 [AWS 免費方案限制](#) 後即開始扣款。我們提供設定簡單的 [帳單警示](#) 功能，可監控 AWS 用量，確保您只支付真正所需的服務。進一步了解如何追蹤 [AWS 免費方案用量](#)。

其他問題？

[請不吝提問](#)，我們十分樂意傾聽您的意見。

以下連結可以了解 AWS 現在免費的方案：

<https://aws.amazon.com/tw/free/>

<https://aws.amazon.com/tw/free/#legal>

The screenshot shows the AWS Free Tier page with the title "AWS 免費方案 (不會過期):". Below the title, it states: "** 這些免費方案不會在 AWS 免費方案 12 個月的期限結束後自動過期，而且所有 AWS 客戶都能使用。"

The page lists several services and their free tier limits:

- Amazon DynamoDB**
 - 可與 Amazon DynamoDB 搭配使用的 25 GB 儲存、25 個單位的寫入容量和 25 個單位的讀取容量，足以處理最多每個月 2 億個請求。"
- Amazon Cognito**
 - 您的使用者集區功能提供每月 50,000 個 MAU 的免費方案"
 - 針對驗證使用者和產生唯一識別符的聯合身分功能，Amazon Cognito 一律不收取費用"

Cognito 也包含：

 - 10 GB 的雲端同步儲存。註冊後 12 個月過期
 - 每月 1,000,000 個同步操作。註冊後 12 個月過期

您的使用者集區功能目前為 Beta 版。為了 Multi-Factor Authentication (MFA) 和電話驗證而傳送 SMS 訊息不需付費。然而在 Beta 版期間結束之後，傳送 SMS 訊息將按定價收費。
- Amazon Simple Workflow Service (SWF)**
 - 1,000 個 Amazon SWF 工作流程執行動作和總共 10,000 個活動任務、信號、計時器和標記，以及 30,000 個工作流程天數。"
- Amazon Simple Queue Service (SQS) 和 Amazon Simple Notification Service (SNS)**
 - 1,000,000 個 Amazon Simple Queue Service 的請求"
 - 可與 Amazon Simple Notification Service 配合使用的 1,000,000 個請求、100,000 個 HTTP 通知和 1,000 封電子郵件通知"
- Amazon Elastic Transcoder**
 - 20 分鐘的 SD 轉碼或 10 分鐘的 HD 轉碼"
- AWS Key Management Service**
 - 每月 20,000 個免費請求"

進行身分驗證：

The screenshot shows the "電話驗證" (Phone Verification) screen. It instructs the user: "AWS 會使用自動系統立即打給您。聽到提示時，請用電話鍵盤輸入 AWS 網站上的 4 位數號碼。"

Below this, it says "提供電話號碼" and asks the user to provide their phone number. There is a dropdown for "國家/地區代碼" (Country/Region Code) with "台灣 (+886)" selected. There are input fields for "電話號碼" (Phone Number) and "分機" (Extension). A "安全性檢查" (Security Check) section shows a CAPTCHA with the text "857w6e". Below the CAPTCHA is a text input field for "請輸入上面所顯示的字元" (Enter the characters shown above).

At the bottom, there is a yellow button labeled "立刻打電話給我" (Call me now).

At the very bottom, there is a copyright notice: "© 2018 Amazon Web Services, Inc. 或其附屬公司。保留所有權利。" and links for "隱私權政策" (Privacy Policy), "使用條款" (Terms of Use), and "登出" (Sign Out).

身分驗證結束之後，會出現驗證成功的視窗。



已成功驗證您的身分。

繼續

接著，依照各人/企業需求，選擇方案：

選取支援計劃

AWS 提供一系列精選支援方案，滿足您的各種需求。依據您的 AWS 用量，選出最適合的支援方案。[進一步了解](#)

基本方案	開發人員計劃	商業計劃
免費	29 USD/月起	100 USD/月起
<ul style="list-style-type: none">• 隨附於所有帳戶• 全年無休，自助式參與論壇及存取資源• 最佳實務檢查，協助提升安全性與效能• 存取健康狀態和通知	<ul style="list-style-type: none">• 用於早期採用、測試與開發• 營業時間可經由電子郵件聯絡 AWS Support• 1 名主要聯絡人可以拓展的案例數量無限制• 非生產系統的 12 小時回應時間	<ul style="list-style-type: none">• 用於生產工作負載和商業關鍵依存項目• 可經由線上聊天、電話和電子郵件，全年無休聯絡 AWS Support• 無限聯絡人可以拓展的案例數量無限制• 生產系統的 1 小時回應時間

需要企業級支援？
聯絡您的客戶經理，以獲得更多在 AWS 上執行業務和關鍵任務工作負載的資訊 (15000 USD/月起算)。[進一步了解](#)

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點選方案後，會進入官方中文教學。

【小叮嚀】

到這裡，恭喜你完成第一步驟了，請等待至少兩個小時，官方需要至少兩個小時以上的內部驗證身分時間，要是太早進入後面步驟，可能會因為身分尚未通過，而發生問題您。

Launch Failed

Your account is currently being verified. Verification normally takes less than 2 hours.

Step 2 設定雲計算 Server

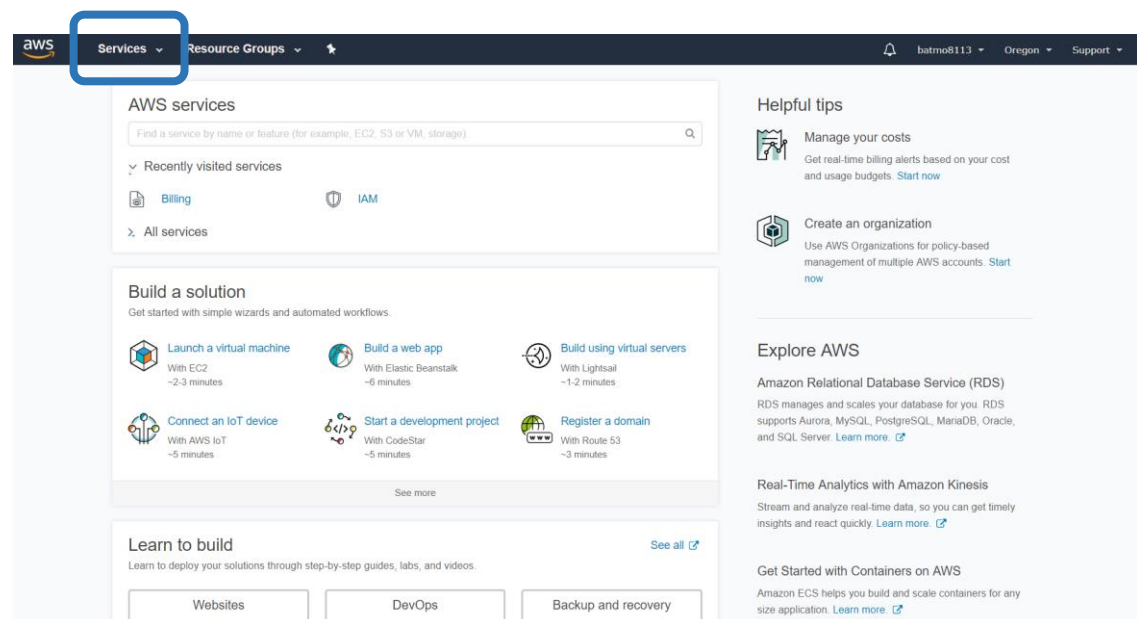
點選右上角【登入主控台】，輸入剛才設定的帳號密碼。

<https://aws.amazon.com/tw/registration-confirmation/>

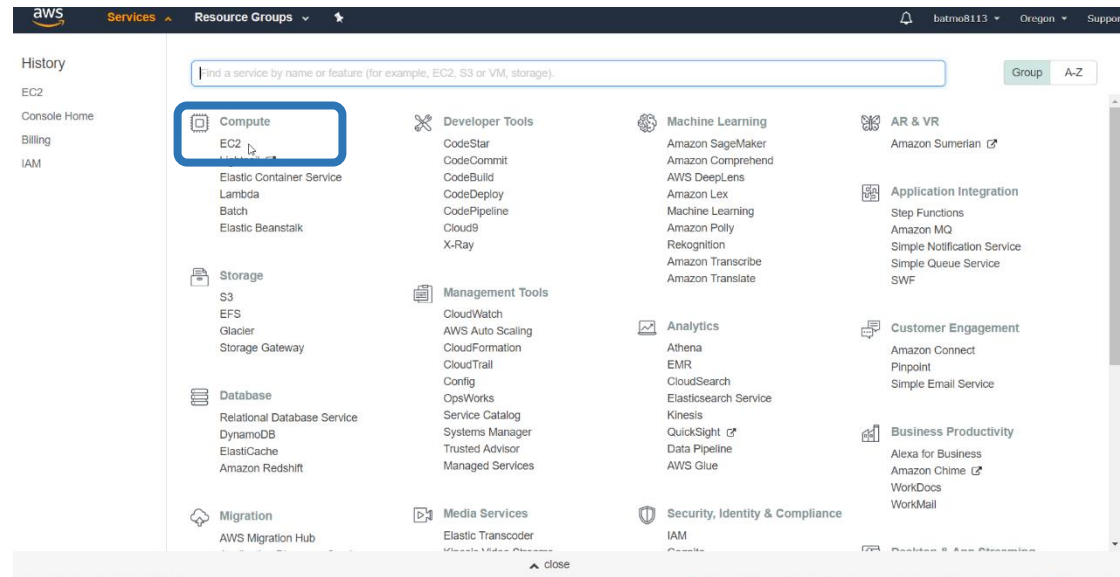


接續點選左上角【Service】

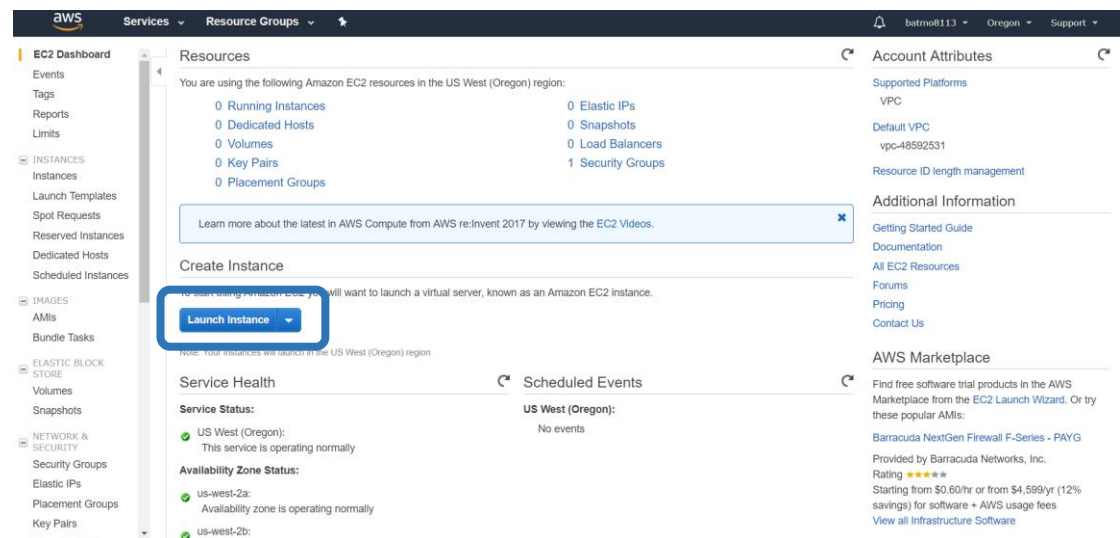
可能中文化還沒完成，這裡開始自動變成英文模式。



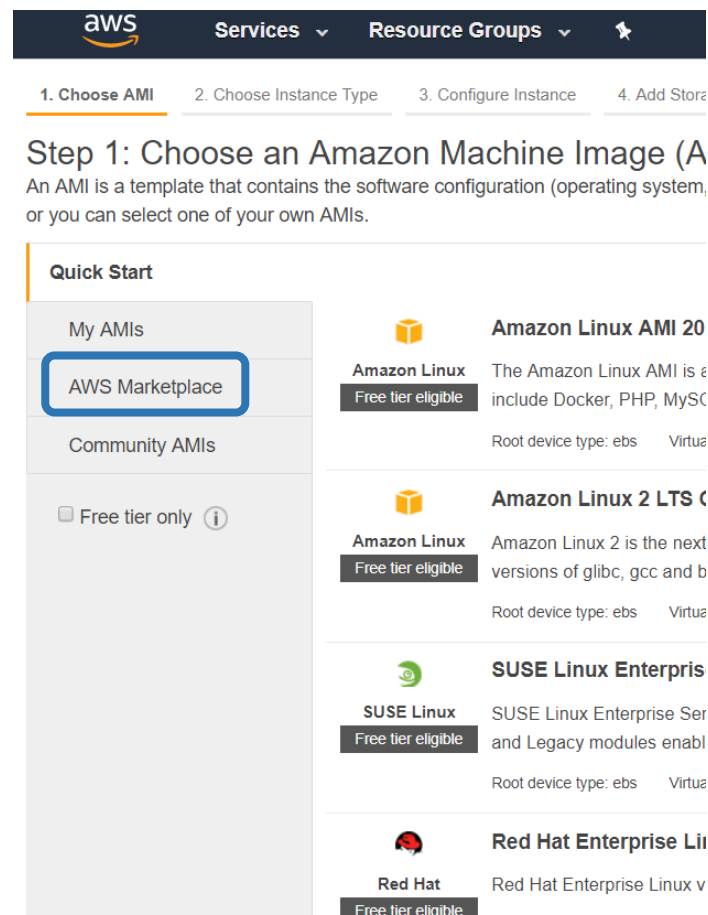
選擇【EC2】(EC2 是 Amazon 免費主機):



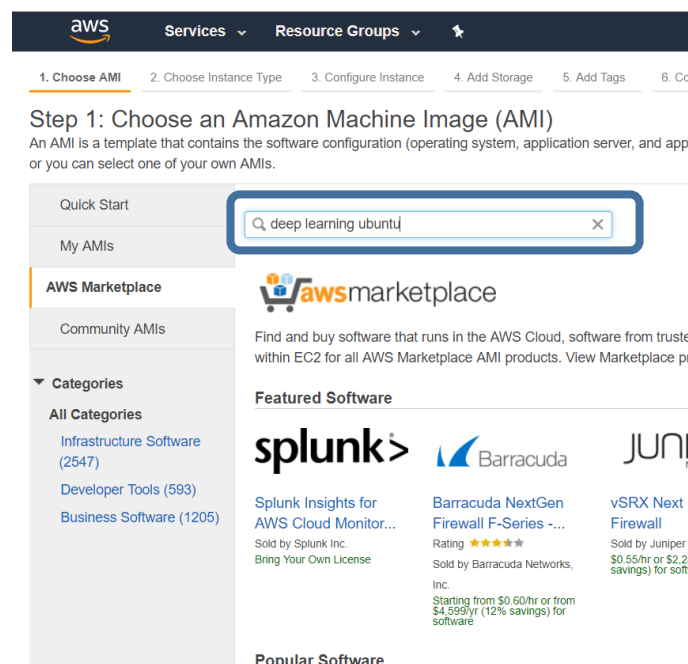
點選中間按鈕【Launch Instance】:



點選左欄的【AWS Marketplace】：



於搜尋欄可輸入自己要的 AMI:



甚麼是 AMI? 以下連結，官網有提供中文說明：

<https://aws.amazon.com/tw/amazon-linux-ami/>

Amazon Linux AMI

建立免費帳戶

Amazon Linux AMI 是由 Amazon Web Services 所提供，可在 Amazon Elastic Compute Cloud (Amazon EC2) 上使用，且受 Linux 支援和維護的映像。它旨在為 Amazon EC2 上執行的應用程式提供穩定、安全和高效能的執行環境。它支援最新的 EC2 執行個體類型功能，也包含易於與 AWS 整合的套件。Amazon Web Services 為執行 Amazon Linux AMI 的所有執行個體提供持續的安全性和維護更新。Amazon EC2 使用者無須支付其他費用即可使用 Amazon Linux AMI。

搜尋完後，依照需求選擇需要的版本，點選【Select】：

The screenshot shows the AWS Marketplace interface for Linux AMIs. Three options are listed:

- Amazon Linux AMI 2017.09.1 (HVM), SSD Volume Type** - ami-d874e0a0. Includes Docker, PHP, MySQL, PostgreSQL, and other packages. Root device type: ebs, Virtualization type: hvm, ENA Enabled: Yes. **Select** button.
- Amazon Linux 2 LTS Candidate AMI 2017.12.0 (HVM), SSD Volume Type** - ami-7f43f307. Includes the latest LTS kernel (4.9) and systemd support. Root device type: ebs, Virtualization type: hvm, ENA Enabled: Yes. **Select** button.
- SUSE Linux Enterprise Server 12 SP3 (HVM), SSD Volume Type** - ami-6bc56f13. Includes Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled. Root device type: ebs, Virtualization type: hvm, ENA Enabled: Yes. **Select** button.

畫面會轉跳到這個 AMI 的相關資訊，點選右下角【Continue】：

The screenshot shows the AWS Marketplace page for 'Deep Learning AMI (Ubuntu)'. The page is divided into several sections:

- Product Details:** Includes 'Sold by Amazon Web Services', 'Customer Rating 5.0 (3)', 'Latest Version 5.0', 'Base Operating System Linux/Unix, Ubuntu 16.04', 'Delivery Method 64-bit Amazon Machine Image (AMI)', 'License Agreement End User License Agreement', 'On Marketplace Since 11/15/17', and 'AWS Services Required Amazon EC2, Amazon EBS'.
- Deep Learning AMI (Ubuntu) Description:** Comes with latest, official binaries of popular deep learning frameworks installed in separate virtual environments. Includes Apache MXNet, TensorFlow, PyTorch, Caffe, Caffe2, Keras, Chainer, CNTK and Theano. Also includes Anaconda Data Science packages. The Deep Learning AMI is provided at no additional charge to Amazon EC2 users.
- Pricing Details:** A table showing hourly fees for various instance types. The table has columns for Instance Type, Software, EC2, and Total. The total fee is highlighted in green.
- Buttons:** A green arrow points to the 'Continue' button in the bottom right corner.

出現的轉跳畫面，是各種 instance 的方案，不同的 instance 皆有

自己的價格和計算能力等等：

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types Current generation Show/Hide Columns

Currently selected: p3.2xlarge (23.5 ECUs, 8 vCPUs, 2.7 GHz, Intel Xeon E5-2686 v4, 61 GiB memory, EBS only)

Note: The vendor recommends using a p3.2xlarge instance (or larger) for the best experience with this product.

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="radio"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="radio"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="radio"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="radio"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="radio"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="radio"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="radio"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="radio"/>	General purpose	m5.large	2	8	EBS only	Yes	Up to 10 Gigabit	Yes

Cancel Previous Review and Launch Next: Configure Instance Details

拉至下方可以看到 GPU 計算的方案，這裡建議基本的 p2.xlarge，

如需要更快的速度等等功能，可挑選其他更好的方案。挑選完之後，

點選右下角【Next: Configure Instance Details】：

Step 2: Choose an Instance Type

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input checked="" type="radio"/>	FPGA instances	f1.2xlarge	8	122	1 x 470 (SSD)	Yes	Up to 10 Gigabit	Yes
<input checked="" type="radio"/>	FPGA instances	f1.16xlarge	64	976	4 x 940 (SSD)	Yes	25 Gigabit	Yes
<input type="radio"/>	GPU graphics	g3.4xlarge	16	122	EBS only	Yes	Up to 10 Gigabit	Yes
<input type="radio"/>	GPU graphics	g3.8xlarge	32	244	EBS only	Yes	10 Gigabit	Yes
<input type="radio"/>	GPU graphics	g3.16xlarge	64	488	EBS only	Yes	25 Gigabit	Yes
<input type="radio"/>	GPU instances	g2.2xlarge	8	15	1 x 60 (SSD)	Yes	High	-
<input type="radio"/>	GPU instances	g2.8xlarge	32	60	2 x 120 (SSD)	-	10 Gigabit	-
<input checked="" type="radio"/>	GPU compute	p2.xlarge	4	61	EBS only	Yes	High	Yes
<input type="radio"/>	GPU compute	p2.8xlarge	32	488	EBS only	Yes	10 Gigabit	Yes
<input type="radio"/>	GPU compute	p2.16xlarge	64	732	EBS only	Yes	25 Gigabit	Yes
<input type="radio"/>	GPU compute	p3.2xlarge	8	61	EBS only	Yes	Up to 10 Gigabit	Yes
<input type="radio"/>	GPU compute	p3.8xlarge	32	244	EBS only	Yes	10 Gigabit	Yes
<input type="radio"/>	GPU compute	p3.16xlarge	64	488	EBS only	Yes	25 Gigabit	Yes

Cancel Previous Review and Launch Next: Configure Instance Details

轉跳頁面後，點選上方【6. Configure Security Group】，在這是要安裝 instance，為的是之後方便單機電腦連結。

接著點選左下方【Add Rule】：

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name:

Description:

Type	Protocol	Port Range	Source	Description
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Protocol 選擇 TCP，Port Range 填寫 8888，Source 填寫 0.0.0.0/0。

倘若有裝 Jupyter notebooks，此設定可以在 port 8888 執行。輸入完成後，選右下角【Review and Launch】進入下一步，接著再按【Launch】。

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

Assign a security group: ☒ Create a new security group ☐ Select an existing security group

Security group name:

Description:

Type	Protocol	Port Range	Source
SSH	TCP	22	Custom 0.0.0.0/0
Custom TCP Rule	TCP	8888	Custom 0.0.0.0/0

Add Rule

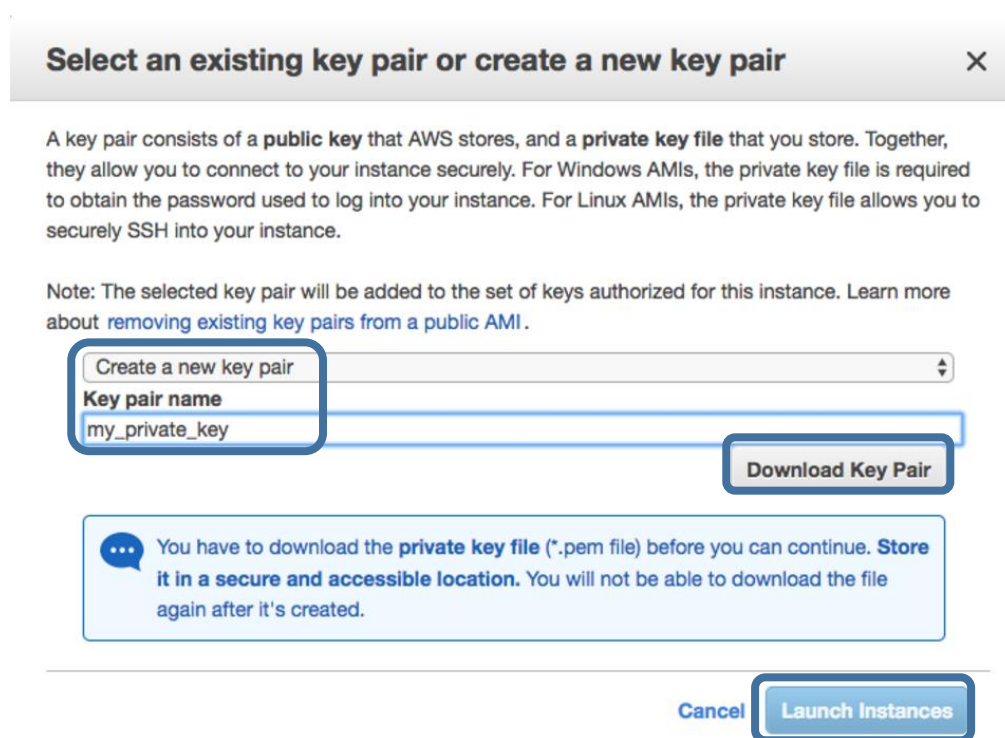
Warning

Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel Previous **Review and Launch**

此時會出現跳脫視窗，如下方圖示。該步驟要設定 key pair，這個 key 檔案會放在你個人電腦裡作為識別，記得別把這份資料公布在公開場合。那麼，我們就開始取得自己的 key 吧！

選擇【Create a new key pair】，並輸入自己 key 的名字。輸入完之後點選【Download Key Pair】下載.pem 的 key 檔案，這份 Key 檔請放在安全的地方，只有在這步驟能下載自己的 key，請好好保存。接著點選【Launch Instances】。



Select an existing key pair or create a new key pair ✕

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

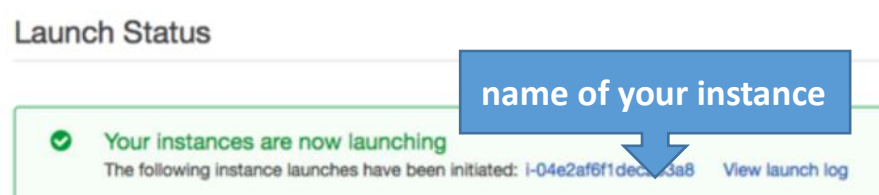
Key pair name
my_private_key

Download Key Pair

... You have to download the **private key file** (*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel **Launch Instances**

發送後會出現成功字樣：



Step 3 連接個人 Server

這裡會利用稱為 ssh 的協議(protocol)進行連接，不同的電腦系統，有不同的連接方式。

mac 或 linux 的電腦使用 ssh command，

Windows 可以使用 PuTTY for ssh connections。

MacOS and Linux

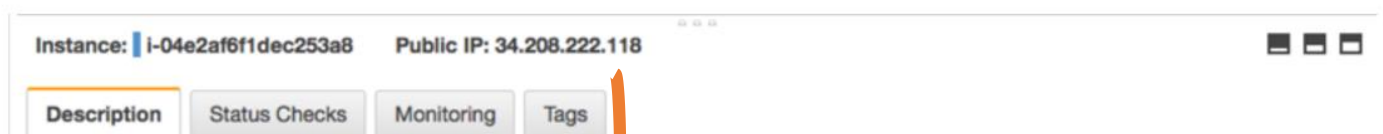
首先，需改變 access privileges

```
chmod 400 my_private_key.pem
```

授權 key 在登入你的 server 時有效

```
ssh-add my_private_key.pem
```

於 EC2 dashboard 找到 servers IP address，以方便登入你的 Server



回到 command line 進行登入 (記得改成自己的 server's IP address.)

```
ssh ubuntu@34.208.222.118
```

登入之後，使用 ipython command 開啟 IPython shell。

若順利進入 IPython shell，恭喜你完成了此次 AWS 設定!!

Windows

若電腦沒有安裝 PuTTY 請至連結安裝

<http://www.chiark.greenend.org.uk/~sgtatham/putty/>

PuTTY: a free SSH and Telnet client

Home | [FAQ](#) | [Feedback](#) | [Licence](#) | [Updates](#) | [Mirrors](#) | [Keys](#) | [Links](#) | [Team](#)
Download: [Stable](#) · [Snapshot](#) | [Docs](#) | [Changes](#) | [Wishlist](#)

PuTTY is a free implementation of SSH and Telnet for Windows and Unix platforms, along with an xterm terminal emulator. It is written and maintained primarily by [Simon Tatham](#).

The latest version is 0.68. [Download it here](#).

LEGAL WARNING: Use of PuTTY, PSCP, PSFTP and Plink is illegal in countries where encryption is outlawed. We believe it is legal to use PuTTY, PSCP, PSFTP and Plink in England and Wales and in many other countries, but we are not lawyers, and so if in doubt you should seek legal advice before downloading it. You may find useful information at [cryptolaw.org](#), which collects information on cryptography laws in many countries, but we can't vouch for its correctness.

Use of the Telnet-only binary (PuTTYtel) is unrestricted by any cryptography laws.

Latest news

依照個人版本下載所需檔案:

Package files

You probably want one of these. They include all the PuTTY utilities.

(Not sure whether you want the 32-bit or the 64-bit version? Read the [FAQ entry](#).)

MSI ('Windows Installer')

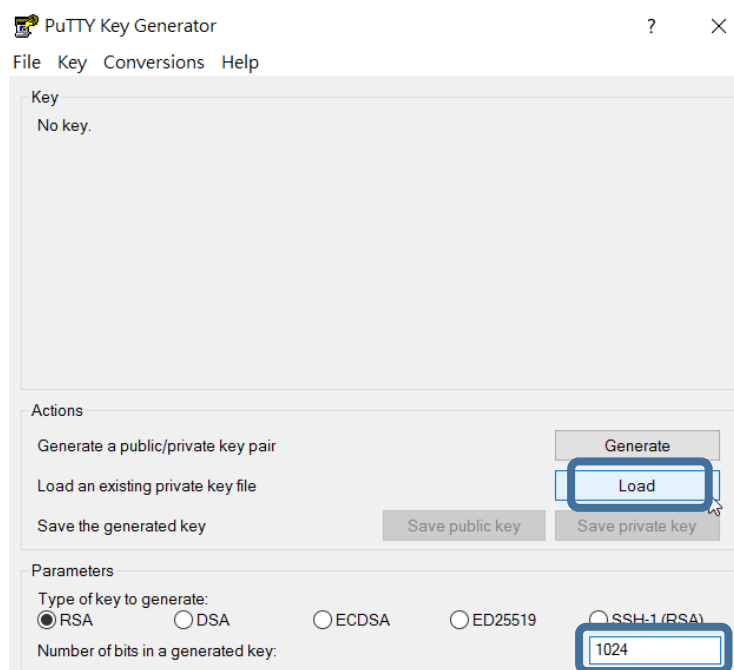
32-bit:	putty-0.68-installer.msi	(or by FTP)	(signature)
64-bit:	putty-64bit-0.68-installer.msi	(or by FTP)	(signature)

Unix source archive

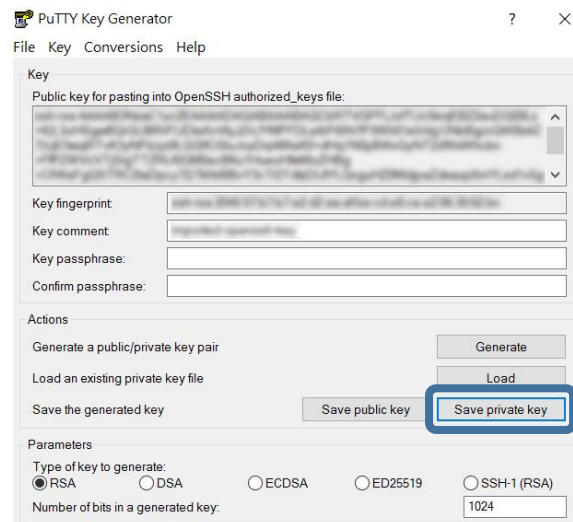
.tar.gz:	putty-0.68.tar.gz	(or by FTP)	(signature)
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以系統管理員執行 puttygen.exe，右下角改成 1024，接著點選

load，匯入之前儲存的 key(副檔名為.pem):



點選[Save private key]，儲存轉換後的 key(副檔名為.ppk):

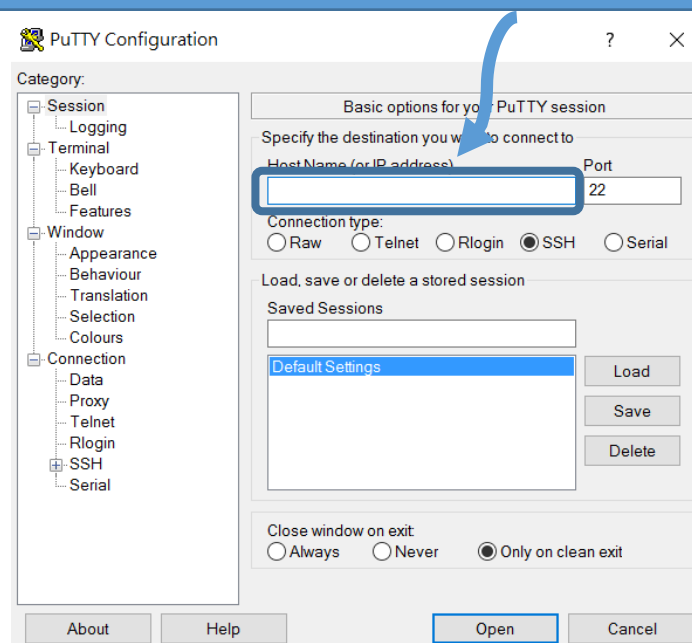


將下載好的檔案放在 C:\WINDOWS 裡。

執行 putty.exe，於 Amazon EC2 dashboard 找到 Public DNS (IPv4)

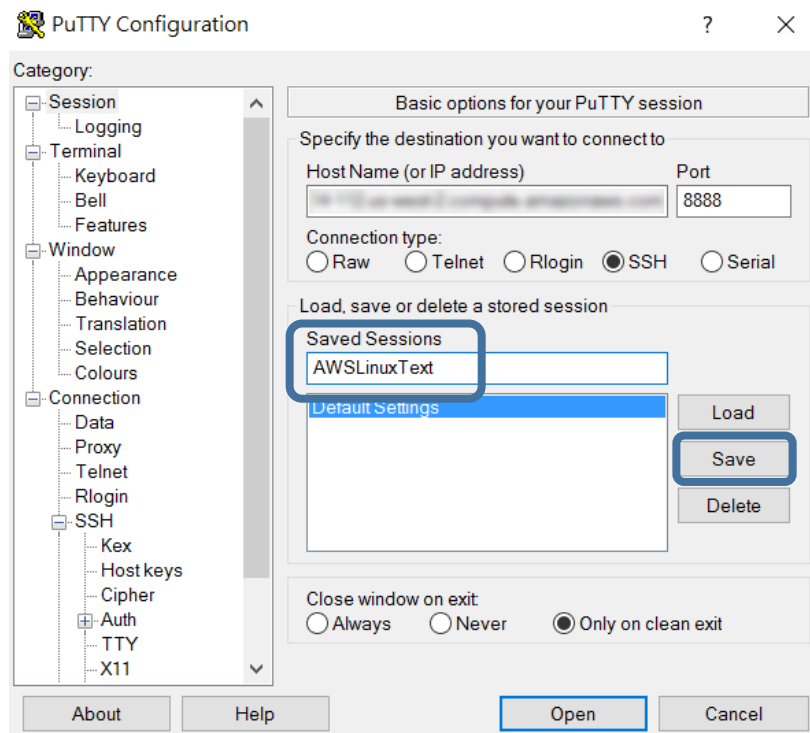
，輸入於@之後，@之前請至官網依照自己的 AMI 輸入(這邊我輸入 ubuntu)，而 Port 維持在 22。此步驟每個人輸入的值會不一樣，記得去找自己所對應版本悠：

ubuntu@ec2-35-164-114-112.us-west-8.compute.amazonaws.com

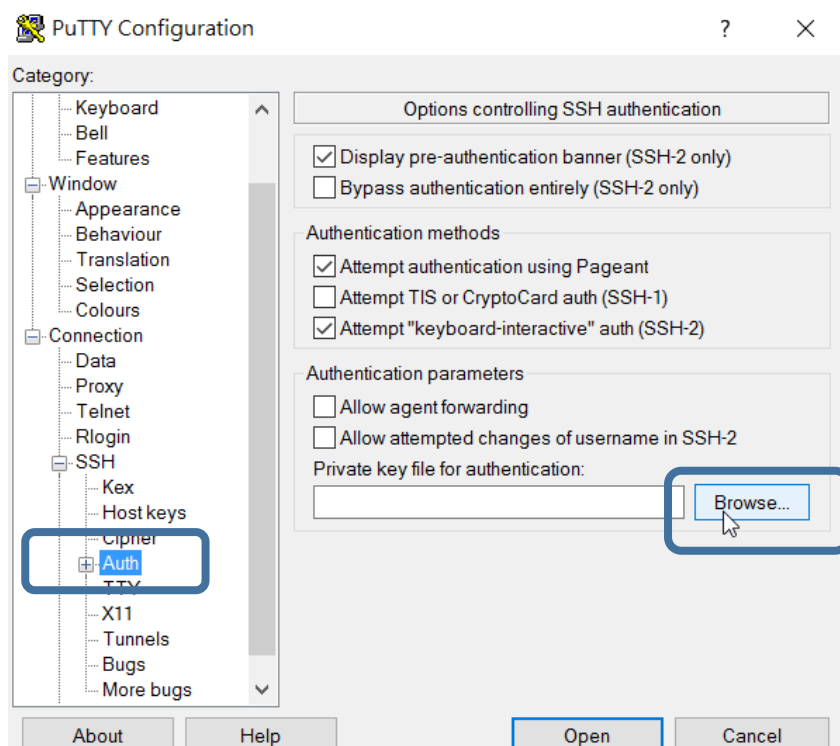


儲存 Sessions，此處命名為 AWSLinuxText (可自行命名)，再按一下

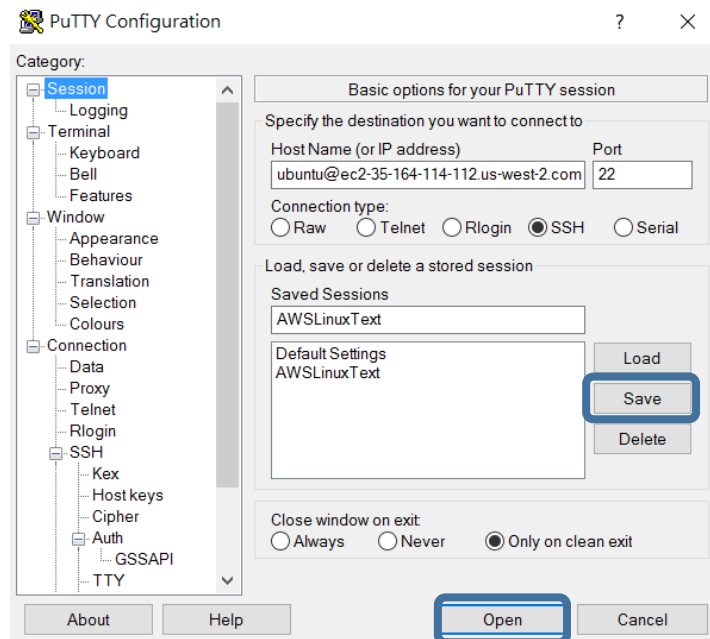
Save:



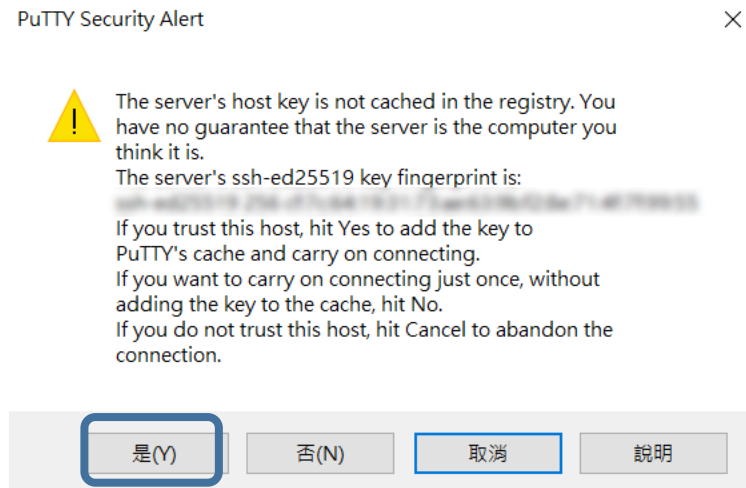
左方點選 Connection> SSH >Auth，右方 Browse 匯入自己的 Private key(副檔名為.ppk):



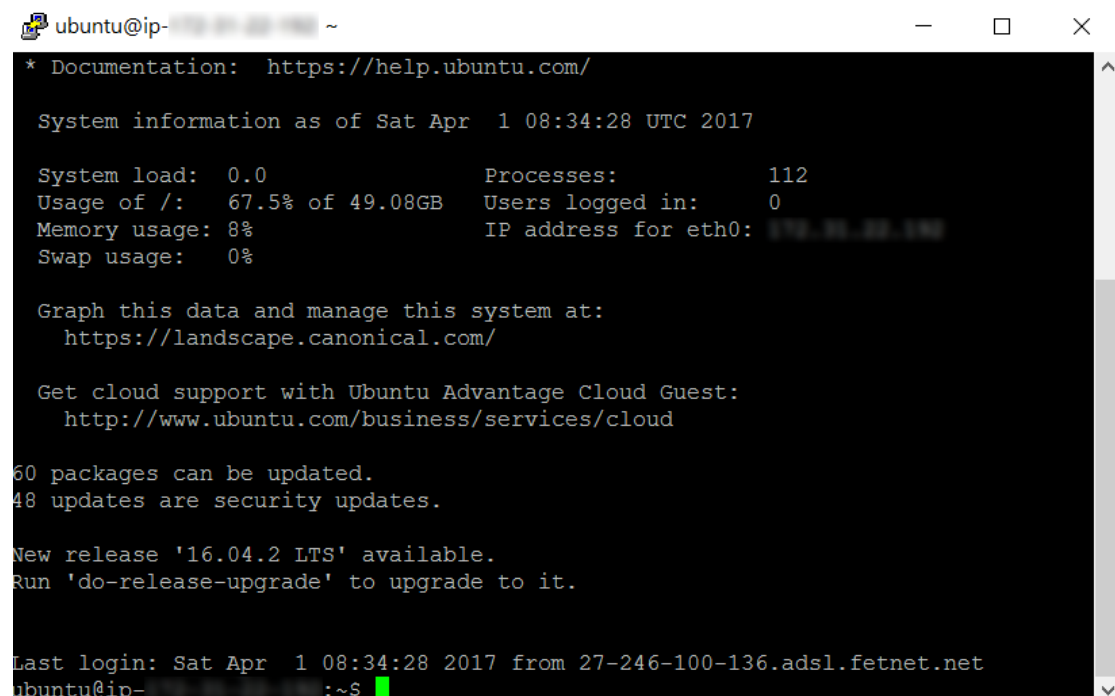
再回到 Session 儲存所有設定，接著點選[Open]:



此時 PuTTY 會出現警示標語，顯示你的 fingerprint，點選[是]進入下一步:



PuTTY 會自動匯入你的 user name 和 key，如果這步驟你沒有成功，可能是前面 Host name 或 key 沒有設定好，再去找一下自己的對應的版本。若看到以下畫面，恭喜你成功進入 AWS!!

A screenshot of a terminal window titled 'ubuntu@ip-...' with standard window controls. The terminal displays system information for Ubuntu 16.04.2 LTS on Saturday, April 1, 2017, at 08:34:28 UTC. It lists system load (0.0), disk usage (67.5% of 49.08GB), memory usage (8%), and swap usage (0%). It also shows 112 processes and 0 users logged in. The IP address for eth0 is 172.31.28.190. The terminal suggests visiting https://landscape.canonical.com/ for system management and http://www.ubuntu.com/business/services/cloud for cloud support. It notes that 60 packages can be updated, including 48 security updates, and that a new release '16.04.2 LTS' is available. The last login was from 27-246-100-136.adsl.fetnet.net. The prompt is 'ubuntu@ip-:~\$' with a green cursor.

```
ubuntu@ip-... ~
* Documentation:  https://help.ubuntu.com/

System information as of Sat Apr  1 08:34:28 UTC 2017

System load:  0.0                       Processes:            112
Usage of /:   67.5% of 49.08GB          Users logged in:     0
Memory usage: 8%                       IP address for eth0: 172.31.28.190
Swap usage:   0%

Graph this data and manage this system at:
  https://landscape.canonical.com/

Get cloud support with Ubuntu Advantage Cloud Guest:
  http://www.ubuntu.com/business/services/cloud

60 packages can be updated.
48 updates are security updates.

New release '16.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat Apr  1 08:34:28 2017 from 27-246-100-136.adsl.fetnet.net
ubuntu@ip-:~$
```

這邊提供 Amazon 官網 PuTTY 教學:

<http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html>

Step 4 結尾：提供 Jupyter Notebook 線上教學連結

最後，如果你有興趣，在 jupyter notebook 連結 AWS，可以參考
下方的教學：

AWS 官方教學

<https://docs.aws.amazon.com/mxnet/latest/dg/setup-jupyter-configure-server.html>

推薦其他作者

<https://towardsdatascience.com/setting-up-and-using-jupyter-notebooks-on-aws-61a9648db6c5>

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資料參考：

<https://www.datacamp.com/community/tutorials/deep-learning-jupyter-aws#gs.6gRpAF4>

<https://mediatemple.net/community/products/dv/204404604/using-ssh-in-putty->

<http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html>

<http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/putty.html>

<https://www.youtube.com/watch?v=BhjTqNftC-I>

<https://towardsdatascience.com/setting-up-and-using-jupyter-notebooks-on-aws-61a9648db6c5>