

# 109AB0716資安報告

## 壹、WSL

### 一、安裝WSL

### 二、檢查目錄

我們先來嘗試找出Ubuntu的檔案根目錄，結果發現裡面檔案都被隱藏起來了  
這是為了避免用Window介面意外更動到Linux的檔案，造成錯誤

### 三、Ubuntu教學

1. 利用 `login` 登入，並且輸入密碼
2. BASH基本指令
3. 這樣我們就進到vim編輯器中
4. 按 `I` 進入編輯模式
5. `#!` 代表通往直譯器的路徑，而我們直譯器 `bash` 預設放在 `/bin` 目錄中  
若 `#` 就代表備註，此行並不會被執行  
這裡我們用 `read` 指令讀進input，並用 `$name` 抓取變數name，`echo` 印出結果
6. 嘗試利用 `:p` 指令儲存 `hello.sh` 檔案並退出 `vim` 筆記本
7. 但這樣會跳出來退出失敗，這是由於還並沒有儲存
8. 利用 `:wq` 指令儲存 `hello.sh` 檔案並退出 `vim` 編輯器
9. 利用 `cat` 指令查看 `hello.sh` 檔案內容
10. 利用 `bash` 指令執行 `hello.sh` 檔案

## 貳、WSL的GUI

1. 安裝VcXsrv
2. 透過WSL安裝環境
3. 新增一個Bash Script用來啟動gui
4. 以vim編輯內容
5. 執行
6. 開啟X server
6. 修改用戶名稱
7. 理論上這樣就可以了，但我還是打不開

## 參、改用套件來安裝GUI

1. 更新apt-get，確保list汰舊換新
2. 安裝 Gedit
3. 安裝 GIMP
4. 安裝 Nautilus
5. 安裝 VLC
6. 安裝 X11 應用程式
7. 安裝 Google Chrome for Linux

切換到暫存目錄：`cd /tmp`

透過 wget 安裝套件：`sudo wget https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb`

取得穩定的版本：`sudo dpkg -i google-chrome-stable_current_amd64.deb`

修正安裝套件：`sudo apt install --fix-broken -y`

再設定一次套件：`sudo dpkg -i google-chrome-stable_current_amd64.deb`

然後還是失敗了，不過還是有學到很多東西

#### 肆、WebGoat

##### 一、安裝流程:

- 1.下載JDK
- 2.下載Webgoat
- 3.設定環境變數
- 4.打開終端機
- 5.輸入指令開啟Webgoat
- 6.開啟瀏覽器，輸入<http://localhost:8080/WebGoat>

##### 二、使用流程

- 1.註冊帳號
- 2.登入成功!
- 3.打開Lesson 1
- 4.第二節內容，輸入名字
- 5.當打開F12後發現是一個POST
- 6.查驗magic number，先送出之後觀測header

##### 三、模擬Proxy

- 1.下載ZAP
- 2.設定port為8081
- 3.打開工具裡的選項
- 4.生成憑證且儲存
- 5.打開瀏覽器→設定→安全性→隱私→憑證
- 6.選擇受信任的根憑證授權單位
- 7.確認無誤點擊完成
- 8.設定→查詢→開啟電腦的Proxy設定
- 9.設定為一樣的8081

#### 伍、Markdown語法

##### 測試文字

測試文字

測試文字

##### 陸、參考資料

##### 柒、心得

# 壹、WSL

## 一、安裝WSL

### SETP1 啟用 Windows 子系統 Linux 版

```
dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart
```

### SETP2 啟用虛擬機器功能

```
dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart
```

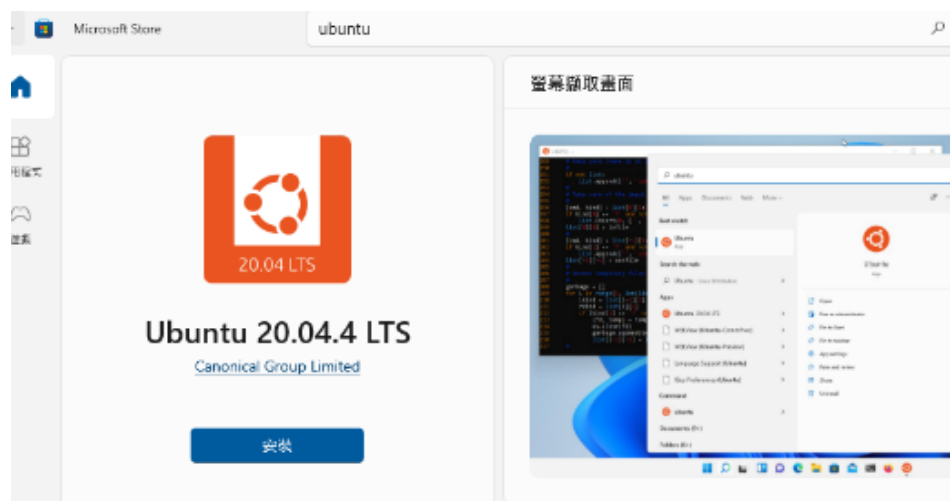
### SETP3 從以下連結下載 Linux 核心更新套件

[https://wslstorestorage.blob.core.windows.net/wslblob/wsl\\_update\\_x64.msi](https://wslstorestorage.blob.core.windows.net/wslblob/wsl_update_x64.msi)

### SETP4 將 WSL 2 設定為預設版本

```
wsl --set-default-version 2
```

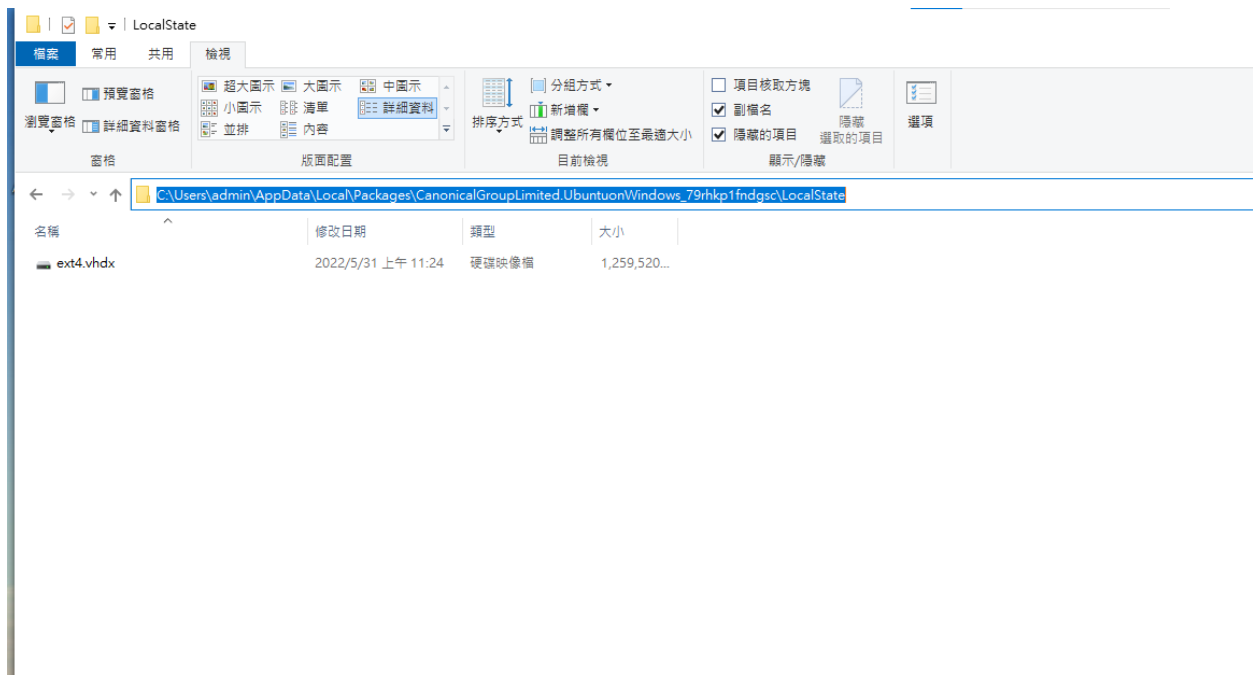
### SETP5 到微軟商店安裝Linux，這裡我選用Ubuntu 20.04.4 LTS



## 二、檢查目錄

我們先來嘗試找出Ubuntu的檔案根目錄，結果發現裡面檔案都被隱藏起來了

這是為了避免用Window介面意外更動到Linux的檔案，造成錯誤



## 三、Ubuntu教學

### 1.利用 `login` 登入，並且輸入密碼

```
ez945y@DESKTOP-MBOCTE4:~$ sudo login
[sudo] password for ez945y:
DESKTOP-MBOCTE4 login:
Login timed out after 60 seconds.
ez945y@DESKTOP-MBOCTE4:~$ pwd
/home/ez945y
```

### 2.BASH基本指令

- `pwd` 顯示目前所在位置(print word)
- `ls` 顯示目前所在位置的檔案(list)
- `cd` 切換當前所在位置的檔案(change word)
- `.` 代表目前所在位置
- `..` 代表目前所在位置的父資料夾

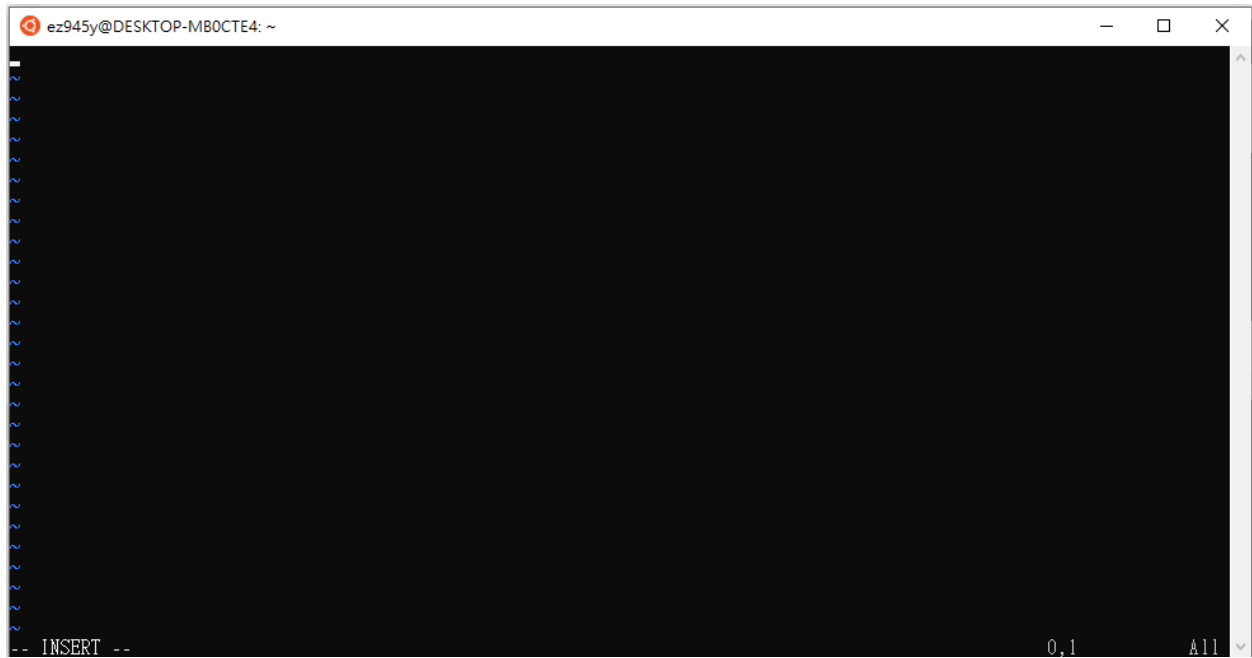
- `mkdir` 建立一個新的資料夾(make direction)
- `touch` 建立一個新檔案
- `vim` 開啟Vim編輯器

```
ez945y@DESKTOP-MB0CTE4: ~  
ez945y@DESKTOP-MB0CTE4:~$ pwd  
/home/ez945y  
ez945y@DESKTOP-MB0CTE4:~$ ls  
ez945y@DESKTOP-MB0CTE4:~$ cd ..  
ez945y@DESKTOP-MB0CTE4:/home$ cd ez945y  
ez945y@DESKTOP-MB0CTE4:~$ mkdir newbag  
ez945y@DESKTOP-MB0CTE4:~$ vim hello.sh
```

### 3. 這樣我們就進到vim編輯器中

A screenshot of a terminal window. The title bar at the top reads "ez945y@DESKTOP-MB0CTE4: ~". The terminal area has a black background. On the far left, there is a vertical column of approximately 20 light blue tilde (~) characters. At the bottom of the terminal, the text "\"hello.sh\" [New File]" is visible on the left, and "0,0-1 All" is visible on the right. The window includes standard OS controls (minimize, maximize, close) in the top right corner.

#### 4.按 I 進入編輯模式

A screenshot of a terminal window titled 'ez945y@DESKTOP-MB0CTE4: ~'. The terminal shows a Vim editor in INSERT mode, indicated by '-- INSERT --' at the bottom left. The status bar at the bottom right shows '0,1' and 'All'. The left side of the terminal has a vertical column of blue tilde characters (~).

5. `#!` 代表通往直譯器的路徑，而我們直譯器 `bash` 預設放在 `/bin` 目錄中

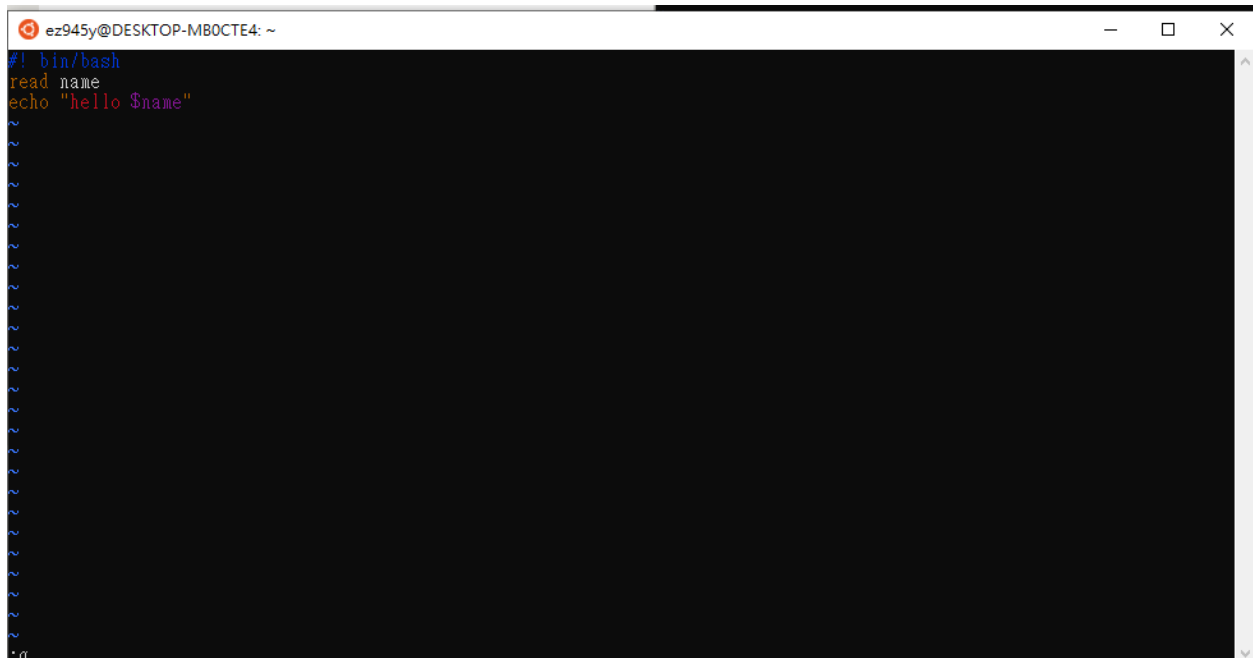
若 `#` 就代表備註，此行並不會被執行

這裡我們用 `read` 指令讀進input，並用 `$name` 抓取變數name，`echo` 印出結果

A screenshot of a terminal window titled 'ez945y@DESKTOP-MB0CTE4: ~'. The terminal shows a Vim editor in INSERT mode, indicated by '-- INSERT --' at the bottom left. The status bar at the bottom right shows '3,19' and 'All'. The left side of the terminal has a vertical column of blue tilde characters (~). The script content visible in the editor is:

```
#!/bin/bash
read name
echo "hello $name"
```

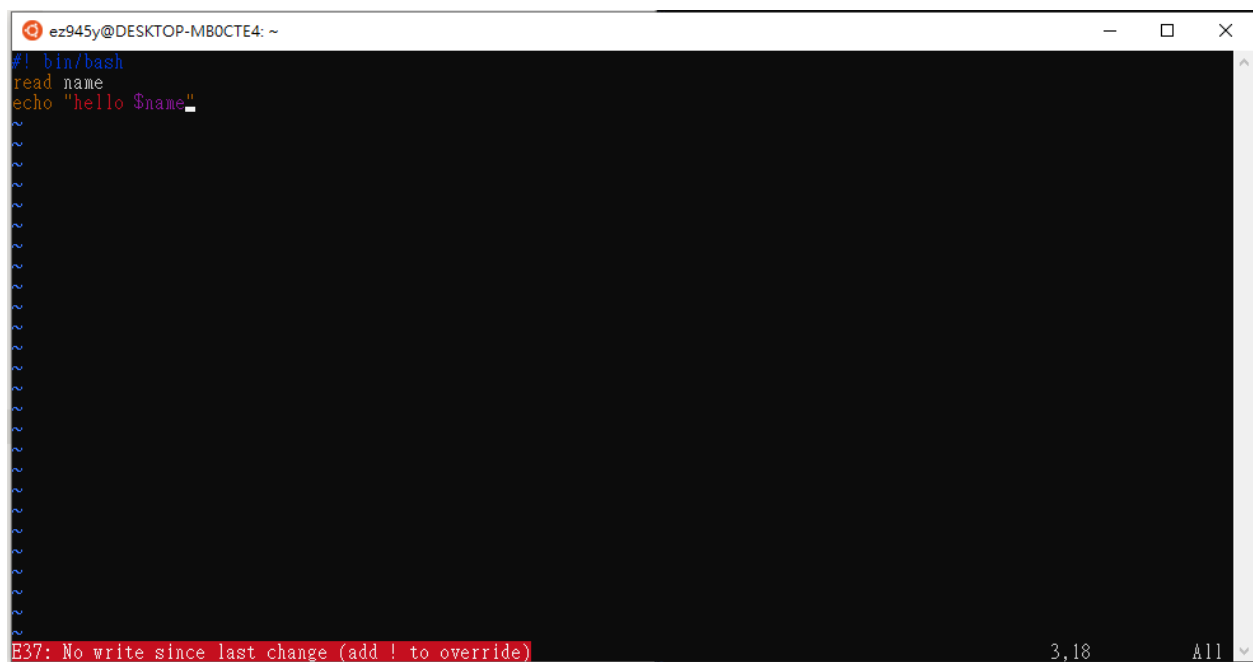
6.嘗試利用 `:p` 指令儲存 `hello.sh` 檔案並退出 `vim` 筆記本

A terminal window titled 'ez945y@DESKTOP-MB0CTE4: ~' with standard window controls. It contains a script: 

```
#!/bin/bash
read name
echo "hello $name"
```

 followed by several tilde (~) characters representing input. The script has been executed, but no output is visible.

7.但這樣會跳出來退出失敗，這是由於還並沒有儲存

A terminal window titled 'ez945y@DESKTOP-MB0CTE4: ~' with standard window controls. It contains the same script as the previous image: 

```
#!/bin/bash
read name
echo "hello $name"
```

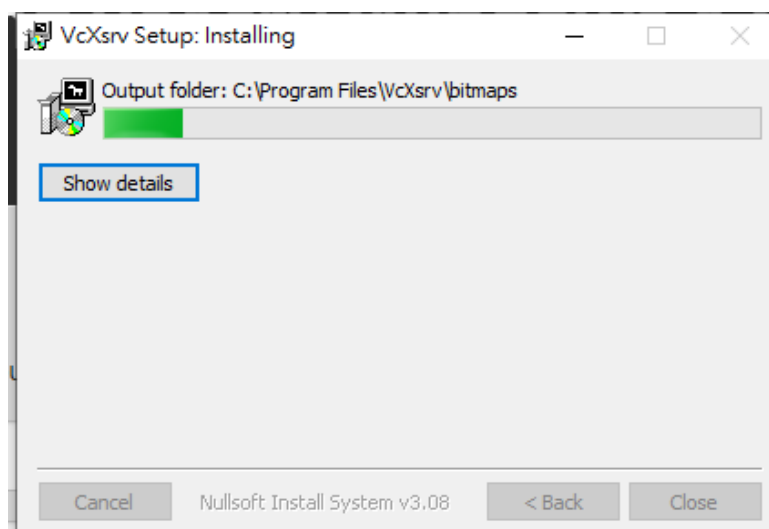
 followed by several tilde (~) characters. At the bottom, a red error message is displayed: `E37: No write since last change (add ! to override)`. To the right of the message, the text '3,18' and 'A11' are visible.

8.利用 `:wp` 指令儲存 `hello.sh` 檔案並退出 `vim` 編輯器





## 貳、WSL的GUI



### 1. 安裝VcXsrv

下載點：<https://sourceforge.net/projects/vcxsrv/files/latest/download>

### 2. 透過WSL安裝環境

```
sudo apt-get install ubuntu-desktop gnome-tweak-tool
```

```
ez945y@DESKTOP-MBOCTE4:/tmp$ xdpinfo
xdpyinfo: unable to open display "".
ez945y@DESKTOP-MBOCTE4:/tmp$ sudo apt-get install ubuntu-desktop gnome-tweak-tool
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package ubuntu-desktop
ez945y@DESKTOP-MBOCTE4:/tmp$ touch gui.sh
ez945y@DESKTOP-MBOCTE4:/tmp$ chmod u+x gui.sh
ez945y@DESKTOP-MBOCTE4:/tmp$ vim gui.sh
```

### 3. 新增一個Bash Script用來啟動gui

```
touch gui.sh
chmod u+x gui.sh
```

```
ez945y@DESKTOP-MB0CTE4: /tmp
~
# bin/bash
sudo service dbus restart
/mnt/c/Program\ Files/VcXsrv/vcxsrv.exe :0 -ac &
DISPLAY=0:0 XDG_SESSION_TYPE=x11 gnome-session
/mnt/c/Windows/System32/taskkill.exe /IM vcxsrv.exe /T /F
```

## 4. 以vim編輯內容

```
#!/bin/bash
sudo service dbus restart
/mnt/c/Program\ Files/VcXsrv/vcxsrv.exe :0 -ac &
DISPLAY=0:0 XDG_SESSION_TYPE=x11 gnome-session
/mnt/c/Windows/System32/taskkill.exe /IM vcxsrv.exe /T /F
```

## 5. 執行

```
sudo ./gui.sh
```

```
ez945y@DESKTOP-MB0CTE4:/tmp$ cat gui.sh
#!/bin/bash
sudo service dbus restart
/mnt/c/Program\ Files/VcXsrv/vcxsrv.exe :0 -ac &
DISPLAY=0:0 XDG_SESSION_TYPE=x11 gnome-session
/mnt/c/Windows/System32/taskkill.exe /IM vcxsrv.exe /T /F
ez945y@DESKTOP-MB0CTE4:/tmp$ sudo bash gui.sh
* Stopping system message bus dbus [ OK ]
* Starting system message bus dbus
dbus[14874]: Unknown username "whoopsie" in message bus configuration file [ OK ]
Unable to init server: Could not connect: Connection refused

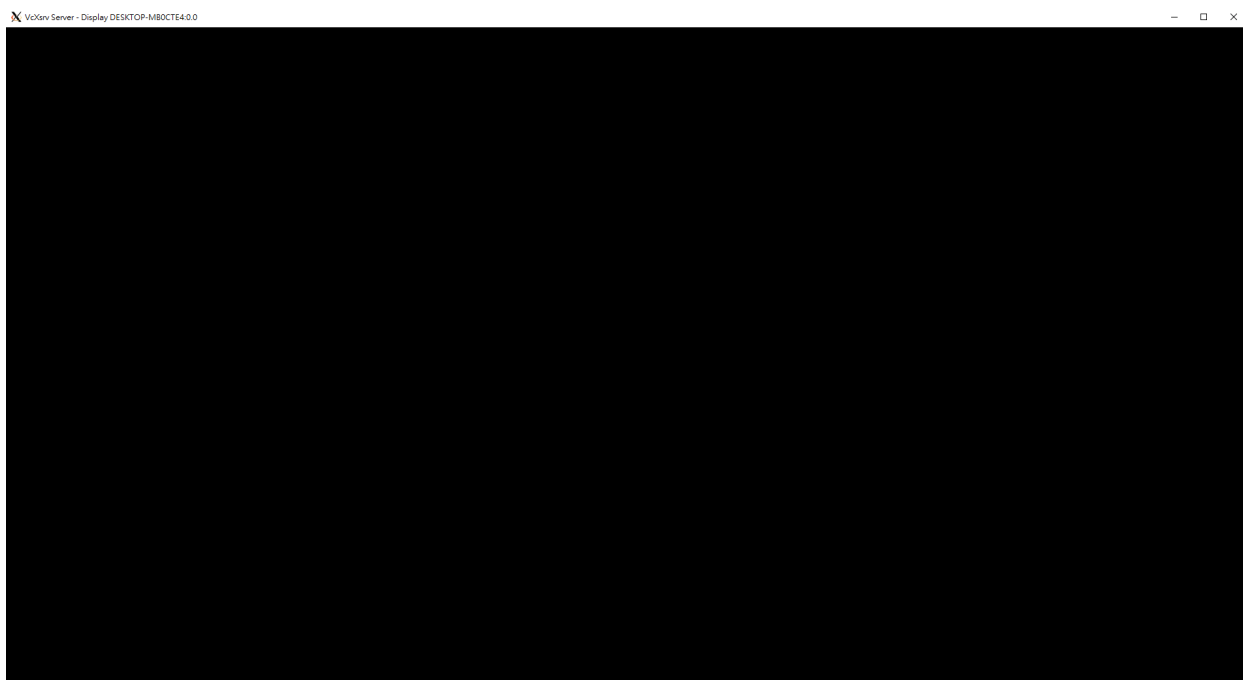
(gnome-session-check-accelerated:14889): Gtk-WARNING **: 13:30:47.535: cannot open display: 0:0
Unable to init server: Could not connect: Connection refused

(gnome-session-check-accelerated:14890): Gtk-WARNING **: 13:30:47.543: cannot open display: 0:0
gnome-session-binary[14879]: WARNING: software acceleration check failed: Child process exited with code 1
gnome-session-binary[14879]: CRITICAL: We failed, but the fail whale is dead. Sorry....
Welcome to the VcXsrv X Server
Vendor: The VcXsrv Project
Release: 1.20.14.0

OS: Windows NT 6.2 build 9200 (64-bit)
Contact: marha@users.sourceforge.net

LoadPreferences: C:\Users\admin\AppData\Roaming\XWinrc not found
LoadPreferences: Loading C:\Program Files\VcXsrv\system.XWinrc
成功: PID 為 7236 (PID 為 16976 的子處理程序) 的處理程序已終止。 [ OK ]
```

## 6. 開啟X server



## 6. 修改用戶名稱

```
sudo chown -R username:username .cache
```

## 7.理論上這樣就可以了，但我還是打不開

# 參、改用套件來安裝GUI

## 1.更新apt-get，確保list汰舊換新

```
ez945y@DESKTOP-MBOCTE4: ~  
ez945y@DESKTOP-MBOCTE4:~$ sudo apt-get update  
[sudo] password for ez945y:  
Hit:1 http://archive.ubuntu.com/ubuntu focal InRelease  
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]  
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]  
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]  
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1487 kB]  
Get:6 http://archive.ubuntu.com/ubuntu focal/universe amd64 Packages [8628 kB]  
Get:7 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [255 kB]  
Get:8 http://security.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [10.4 kB]  
Get:9 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [945 kB]  
Get:10 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [134 kB]  
Get:11 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 c-n-f Metadata [520 B]  
Get:12 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [703 kB]  
Get:13 http://security.ubuntu.com/ubuntu focal-security/universe Translation-en [126 kB]  
Get:14 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [14.4 kB]  
Get:15 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [22.2 kB]  
Get:16 http://security.ubuntu.com/ubuntu focal-security/multiverse Translation-en [5376 B]  
Get:17 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 c-n-f Metadata [512 B]  
Get:18 http://archive.ubuntu.com/ubuntu focal/universe Translation-en [5124 kB]  
Get:19 http://archive.ubuntu.com/ubuntu focal/universe amd64 c-n-f Metadata [265 kB]  
Get:20 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 Packages [144 kB]  
Get:21 http://archive.ubuntu.com/ubuntu focal/multiverse Translation-en [104 kB]  
Get:22 http://archive.ubuntu.com/ubuntu focal/multiverse amd64 c-n-f Metadata [9136 B]  
Get:23 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1830 kB]  
Get:24 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [336 kB]  
Get:25 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [15.4 kB]  
Get:26 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [1008 kB]  
Get:27 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [143 kB]  
Get:28 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [520 B]  
Get:29 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [924 kB]  
Get:30 http://archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [207 kB]  
Get:31 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [20.7 kB]  
Get:32 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [24.4 kB]  
Get:33 http://archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [7336 B]  
Get:34 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [596 B]  
Get:35 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [44.5 kB]  
Get:36 http://archive.ubuntu.com/ubuntu focal-backports/main Translation-en [10.9 kB]  
Get:37 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [980 B]  
Get:38 http://archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [116 B]  
Get:39 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [23.6 kB]  
Get:40 http://archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [15.9 kB]  
Get:41 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [860 B]
```

## 2.安裝 Gedit

```

ez4545@DESKTOP-MBOCTE4:~$ sudo apt-get install gedit -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
acl adwaita-icon-theme app aptdaemon aptdaemon-data aspell aspell-en at-spi2-core avahi-daemon avahi-utils bluez
bubblewrap cheese-common colord colord-data cpp cpp-9 cracklib-runtime crda cups-pk-helper dconf-cli
desktop-file-utils dictionaries-common dns-root-data dnsmasq-base docbook-xml emacsens-common enchant-2
evolution-data-server evolution-data-server-common fontconfig fprintd gcc-9-base gcr gdm3 gedit-common geoclue-2.0
girl.2-accountsettings-1.0 girl.2-atk-1.0 girl.2-atspi-2.0 girl.2-freedesktop girl.2-gck-1 girl.2-gcr-3
girl.2-gdesktopenums-3.0 girl.2-gdkpixbuf-2.0 girl.2-gdm-1.0 girl.2-geoclue-2.0 girl.2-gnomebluetooth-1.0
girl.2-gnomedesktop-3.0 girl.2-graphene-1.0 girl.2-gtk-3.0 girl.2-gtksource-4 girl.2-gweather-3.0 girl.2-ibus-1.0
girl.2-jolson-1.0 girl.2-mutter-6 girl.2-nm-1.0 girl.2-nma-1.0 girl.2-notify-0.7 girl.2-pango-1.0 girl.2-peas-1.0
girl.2-pokkit-1.0 girl.2-rsvg-2.0 girl.2-secret-1 girl.2-soup-2.4 girl.2-upowerglib-1.0 girl.2-vte-2.91 gjs
gkbd-capplet gnome-control-center gnome-control-center-data gnome-control-center-faces gnome-desktop3-data
gnome-keyring gnome-keyring-pkcs11 gnome-menus gnome-online-accounts gnome-session-bin gnome-session-common
gnome-settings-daemon gnome-settings-daemon-common gnome-shell gnome-shell-common gnome-startup-applications
gnome-user-docs gstreamer1.0-clutter-3.0 gstreamer1.0-gl gstreamer1.0-plugins-base gstreamer1.0-plugins-good
gstreamer1.0-pulseaudio gstreamer1.0-x gtk-update-icon-cache hicolor-icon-theme humanity-icon-theme hunspell-en-us
ibus ibus-data ibus-gtk ibus-gtk3 iio-sensor-proxy im-config ippusbxd iw language-selector-gnome libaa1 libatmk-5-0
libatmk-5-common libappindicator3-1 libasound2-plugins libaspell15 libatk-bridge2.0-0 libatk1.0-0 libatk1.0-data
libatspi2.0-0 libavahi-client3 libavahi-common-data libavahi-common3 libavahi-core7 libavahi-glib1 libavac1394-0
libbluetooth3 libboost-thread1.71.0 libcac0 libcairo-gobject2 libcairo2 libcamel-1.2-62 libcanberra-gtk3-0
libcanberra-gtk3-module libcanberra-pulse libcdparanoia0 libcheese-gtk25 libcheese8 libclutter-1.0-0
libclutter-1.0-common libclutter-gst-3.0-0 libclutter-gtk-1.0-0 libcogl-common libcogl-pango20 libcogl-path20
libcogl20 libcolorctl-gtk1 libcolorctl2 libcolorhug2 libcrack2 libcupsp2 libdaemon0 libdatriel libdbusmenu-glib4
libdbusmenu-gtk3-4 libdvd libbackend-1.2-10 libebook-1.2-20 libebook-contacts-1.2-3 libecal-2.0-1
libedata-book-1.2-26 libedata-cal-2.0-1 libedataserver-1.2-24 libedataserverui-1.2-2 libegl-mesa0 libegl1
libenchant-2-2 libepoxy0 libevdev2 libexif12 libfprint-2-2 libgail-common libgail18 libgail libgck-1-0
libgcr-base-3-1 libgcr-ui-3-1 libgdb3 libgedata-common libgedata22 libgdk-pixbuf2.0-0 libgdk-pixbuf2.0-bin
libgdk-pixbuf2.0-common libgdm libgee-0.8-2 libgeoclue-2.0 libgeocode-glib0 libgjs0g libglib libglib-mesa-dri
libglapi-mesa libgles2 libglvnd libglx-mesa0 libglx0 libgnome-autor-0-0 libgnome-bluetooth13 libgnome-desktop-3-19
libgnomekbd-common libgnomekbd8 libgao-1.0-0b libgao-1.0-common libgao-backend-1.0-1 libgomp libphoto2-6
libphoto2-110n libphoto2-port12 libgraphene-1.0-0 libgraphite2-3 libgstreamer0 libgspell-1-2 libgspell-1-common
libgssdp-1.2-0 libgstreamer-glib1.0 libgstreamer-plugins-base1.0 libgstreamer-plugins-good1.0-0 libgtk-3-0
libgtk-3-bin libgtk-3-common libgtk2.0-0 libgtk2.0-bin libgtk2.0-common libgtksourceview-4-0
libgtksourceview-4-common libtop-2.0-1 libtop-2-common libtoppnp-1.2-0 libtoppnp-av-1.0-2 libtoppnp-dlna-2.0-3
libweather-3-16 libweather-common libharfbuzz-icu0 libharfbuzz0b libhunspell-1.7-0 libhyphen0 libibus-1.0-5
libical3 libidn1 libiec61883-0 libieee1284-3 libimobiledevice6 libinput-bin libinput10 libis122 libjack-jackd2-0
libjansson4 libjavascripcoregtk-4.0-18 libjbig0 libjpeg-turbo8 libjpeg8 liblcms2-2 libldb2 libmbim-glib4
libmbim-proxy libmediaart-2.0-0 libmm-glib0 libmozjs-68-0 libmp3lame0 libmpc3 libmpeg23-0 libmdev libmutter-6-0

```

### 3.安裝 GIMP

```

$ sudo apt-get install gimp -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  fonts-droid-fallback fonts-noto-mono fonts-urw-base35 ghostscript gimp-data i965-via-driver intel-media-via-driver
  libaacs0 libamd2 libao0 libauthen-sasl-perl libavcodec58 libavformat58 libavutil56 libbabi-0.1-0 libbdplus0
  libblas3 libblurai2 libcamd2 libcolamd2 libcholmod3 libchromaprint1 libcodec2-0.9 libcolamd2 libdata-dump-perl
  libde265-0 libencode-locale-perl libexiv2-27 libfile-basedir-perl libfile-desktopentry-perl libfile-listing-perl
  libfile-mimeinfo-perl libfont-afm-perl libgegl-0.4-0 libgegl-common libgexiv2-2 libgfortran5 libgimp2.0 libgme0
  libgs9 libgs9-common libgsm1 libheif1 libhtml-form-perl libhtml-format-perl libhtml-parser-perl libhtml-tagset-perl
  libhtml-tree-perl libhttp-cookies-perl libhttp-daemon-perl libhttp-date-perl libhttp-message-perl
  libhttp-negotiate-perl libidn11 libijs-0.35 libilmbase24 libio-html-perl libio-socket-ssl-perl libio-stringy-perl
  libipc-system-simple-perl libjbig2dec0 liblapack3 liblwp-mediatypes-perl liblwp-protocol-https-perl
  libmailtools-perl libmetis5 libmng2 libmypaint-1.5-1 libmypaint-common libnet-dbus-perl libnet-http-perl
  libnet-smtp-ssl-perl libnet-ssleay-perl libopenexr24 libopenmpt0 libpaper-utils libpaper1 libpoppler-glib8
  libpoppler97 libquadmath0 libraw19 libsd12-2.0-0 libshine3 libsnappy1v5 libssh-gcrypt-4 libsuitesparseconfig5
  libswresample3 libswscale5 libtie-ixhash-perl libtimedate-perl libtiny-perl libumfpack5 liburi-perl libva-drm2
  libva-x11-2 libva2 libvdpau1 libwebpmux3 libwmf0.2-7 libwww-perl libwww-robotrules-perl libxml1-protocol-perl
  libx264-155 libx265-179 libxml-parser-perl libxml-twig-perl libxml-xpathengine-perl libxvidcore4 libzvb1-common
  libzvb10 mesa-va-drivers mesa-vdpau-drivers ocl-icd-libopencl1 perl-openssl-defaults poppler-data va-driver-all
  vdpau-driver-all xdg-utils
Suggested packages:
  fonts-noto fonts-freefont-otf | fonts-freefont-ttf fonts-texgyre ghostscript-x gimp-help-en | gimp-help
  gimp-data-extras gvfs-backends i965-via-driver-shaders libdigest-hmac-perl libgssapi-perl libblurai-bdj exiv2
  libcrypt-ssleay-perl libwmf0.2-7-gtk libauthen-ntlm-perl libunicode-map8-perl libunicode-string-perl xml-twig-tools
  opencl-icd poppler-utils fonts-japanese-mincho | fonts-ipafont-mincho fonts-japanese-gothic | fonts-ipafont-gothic
  fonts-archic-ukai fonts-archic-uming fonts-nanum libvdpau-via-gll nvidia-vdpau-driver
  nvidia-legacy-340xx-vdpau-driver nvidia-legacy-304xx-vdpau-driver
The following NEW packages will be installed:
  fonts-droid-fallback fonts-noto-mono fonts-urw-base35 ghostscript gimp gimp-data i965-via-driver
  intel-media-via-driver libaacs0 libamd2 libao0 libauthen-sasl-perl libavcodec58 libavformat58 libavutil56
  libbabi-0.1-0 libbdplus0 libblas3 libblurai2 libcamd2 libcolamd2 libcholmod3 libchromaprint1 libcodec2-0.9
  libcolamd2 libdata-dump-perl libde265-0 libencode-locale-perl libexiv2-27 libfile-basedir-perl

```

## 4.安裝 Nautilus

```
ez945y@DESKTOP-MB0CTE4:~$ sudo apt-get install nautilus -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  gvfs gvfs-backends gvfs-common gvfs-daemons gvfs-libs libcdio-cdda2 libcdio-paranoia2 libcdio18 libcue2 libdee-1.0-4
  libexempi8 libgif7 libgsf-1-114 libgsf-1-common libgxps2 libmtp-common libmtp-runtime libmtp9
  libnautilus-extension1a libnfs13 libtotem-plparser-common libtotem-plparser18 libtracker-control-2.0-0
  libtracker-miner-2.0-0 libtracker-sparql-2.0-0 libunity-protocol-private0 libunity-scopes-json-def-desktop libunity9
  nautilus-data tracker tracker-extract tracker-miner-fs
Suggested packages:
  bluez-obexd samba-common unity-common eog evince l pdf-viewer gnome-sushi nautilus-extension-brasero nautilus-sendto
  totem l mp3-decoder
The following NEW packages will be installed:
  gvfs gvfs-backends gvfs-common gvfs-daemons gvfs-libs libcdio-cdda2 libcdio-paranoia2 libcdio18 libcue2 libdee-1.0-4
  libexempi8 libgif7 libgsf-1-114 libgsf-1-common libgxps2 libmtp-common libmtp-runtime libmtp9
  libnautilus-extension1a libnfs13 libtotem-plparser-common libtotem-plparser18 libtracker-control-2.0-0
  libtracker-miner-2.0-0 libtracker-sparql-2.0-0 libunity-protocol-private0 libunity-scopes-json-def-desktop libunity9
  nautilus nautilus-data tracker tracker-extract tracker-miner-fs
0 upgraded, 33 newly installed, 0 to remove and 163 not upgraded.
Need to get 3890 kB of archives.
After this operation, 16.2 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 gvfs-common all 1.44.1-1ubuntu1.1 [20.0 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 gvfs-libs amd64 1.44.1-1ubuntu1.1 [97.4 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 gvfs-daemons amd64 1.44.1-1ubuntu1.1 [118 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 gvfs amd64 1.44.1-1ubuntu1.1 [115 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 libcdio18 amd64 2.0.0-2 [58.6 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/main amd64 libcdio-cdda2 amd64 10.2+2.0.0-1 [17.6 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/main amd64 libcdio-paranoia2 amd64 10.2+2.0.0-1 [16.2 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/main amd64 libmtp-common all 1.1.17-3 [27.8 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/main amd64 libmtp9 amd64 1.1.17-3 [163 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/main amd64 libnfs13 amd64 4.0.0-1 [95.1 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 gvfs-backends amd64 1.44.1-1ubuntu1.1 [344 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal/main amd64 libcue2 amd64 2.2.1-2 [19.8 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal/main amd64 libdee-1.0-4 amd64 1.2.7+17.10.20170616-4ubuntu6 [130 kB]
Get:14 http://archive.ubuntu.com/ubuntu focal/main amd64 libexempi8 amd64 2.5.1-1build1 [528 kB]
Get:15 http://archive.ubuntu.com/ubuntu focal/main amd64 libgif7 amd64 5.1.9-1 [32.2 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal/main amd64 libgsf-1-common all 1.14.46-1 [12.7 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal/main amd64 libgsf-1-114 amd64 1.14.46-1 [98.3 kB]
```

## 5.安裝 VLC

```
ez945y@DESKTOP-MB0CTE4:~$ sudo apt-get install vlc -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  fonts-freefont-ttf liba52-0.7.4 libaribb24-0 libass9 libbasicusageenvironment1 libcddeb2 libdc1394-22 libdca0
  libdouble-conversion3 libdvbpsi10 libdvbnav4 libdvdrad7 libebml4v5 libfaad2 libgroupsock8 libixml10 libkate1
  liblirc-client0 liblivemedia77 liblua5.2-0 libmad0 libmatroska6v5 libmpcdec6 libmpeg2-4 libmysofa1
  libopenmpt-modplug1 libpcre2-16-0 libplacebo7 libpostproc55 libprotobuf-lite17 libproxy-tools libqt5core5a
  libqt5dbus5 libqt5gui5 libqt5network5 libqt5svg5 libqt5widgets5 libqt5xmlextras5 libresid-builder0c2a
  libSDL-image1.2 libSDL1.2debian libsidplay2 libsndio7.0 libspatialaudio0 libsrtp1 libssh2-1 libupnp13
  libusageenvironment3 libva-wayland2 libvlc-bin libvlc5 libvlccore9 libxcb-xinerama0 libxcb-xinput0
  qt5-gtk-platformtheme qttranslations5-l10n vlc-bin vlc-data vlc-l10n vlc-plugin-base vlc-plugin-notify vlc-plugin-qt
  vlc-plugin-samba vlc-plugin-skins2 vlc-plugin-video-output vlc-plugin-video-splitter vlc-plugin-visualization
Suggested packages:
  libdvdcss2 lirc qt5-image-formats-plugins qtwallpaper5 sndiod
The following NEW packages will be installed:
  fonts-freefont-ttf liba52-0.7.4 libaribb24-0 libass9 libbasicusageenvironment1 libcddeb2 libdc1394-22 libdca0
  libdouble-conversion3 libdvbpsi10 libdvbnav4 libdvdrad7 libebml4v5 libfaad2 libgroupsock8 libixml10 libkate1
  liblirc-client0 liblivemedia77 liblua5.2-0 libmad0 libmatroska6v5 libmpcdec6 libmpeg2-4 libmysofa1
  libopenmpt-modplug1 libpcre2-16-0 libplacebo7 libpostproc55 libprotobuf-lite17 libproxy-tools libqt5core5a
  libqt5dbus5 libqt5gui5 libqt5network5 libqt5svg5 libqt5widgets5 libqt5xmlextras5 libresid-builder0c2a
  libSDL-image1.2 libSDL1.2debian libsidplay2 libsndio7.0 libspatialaudio0 libsrtp1 libssh2-1 libupnp13
  libusageenvironment3 libva-wayland2 libvlc-bin libvlc5 libvlccore9 libxcb-xinerama0 libxcb-xinput0
  qt5-gtk-platformtheme qttranslations5-l10n vlc-bin vlc-data vlc-l10n vlc-plugin-base vlc-plugin-notify
  vlc-plugin-qt vlc-plugin-samba vlc-plugin-skins2 vlc-plugin-video-output vlc-plugin-video-splitter
  vlc-plugin-visualization
0 upgraded, 68 newly installed, 0 to remove and 163 not upgraded.
Need to get 27.0 MB of archives.
After this operation, 125 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 libdouble-conversion3 amd64 3.1.5-4ubuntu1 [37.9 kB]
```

## 6.安裝 X11 應用程式

```
ez945y@DESKTOP-MBOCTE4:~$ sudo apt install x11-apps -y
[sudo] password for ez945y:
Reading package lists... Done
Building dependency tree
Reading state information... Done
x11-apps is already the newest version (7.7+8).
0 upgraded, 0 newly installed, 0 to remove and 163 not upgraded.
```

## 7.安裝 Google Chrome for Linux

```
ez945y@DESKTOP-MBOCTE4:/tmp$ sudo apt-get install --fix-broken -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
Correcting dependencies... Done
The following additional packages will be installed:
  fonts-liberation
The following NEW packages will be installed:
  fonts-liberation
0 upgraded, 1 newly installed, 0 to remove and 163 not upgraded.
1 not fully installed or removed.
Need to get 822 kB of archives.
After this operation, 2139 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 fonts-liberation all 1:1.07.4-11 [822 kB]
Fetched 822 kB in 2s (357 kB/s)
Selecting previously unselected package fonts-liberation.
(Reading database ... 68750 files and directories currently installed.)
Preparing to unpack .../fonts-liberation_1%3a1.07.4-11_all.deb ...
Unpacking fonts-liberation (1:1.07.4-11) ...
Setting up fonts-liberation (1:1.07.4-11) ...
Setting up google-chrome-stable (102.0.5005.61-1) ...
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/x-www-browser (x-www-browser) in auto mode
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/gnome-www-browser (gnome-www-browser) in au
to mode
update-alternatives: using /usr/bin/google-chrome-stable to provide /usr/bin/google-chrome (google-chrome) in auto mode
Processing triggers for fontconfig (2.13.1-2ubuntu3) ...
ez945y@DESKTOP-MBOCTE4:/tmp$ sudo dpkg -i google-chrome-stable_current_amd64.deb
(Reading database ... 68773 files and directories currently installed.)
Preparing to unpack google-chrome-stable_current_amd64.deb ...
Unpacking google-chrome-stable (102.0.5005.61-1) over (102.0.5005.61-1) ...
Setting up google-chrome-stable (102.0.5005.61-1) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu1) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
```

切換到暫存目錄：`cd /tmp`

透過 wget 安裝套件：`sudo wget https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb`

取得穩定的版本：`sudo dpkg -i google-chrome-stable_current_amd64.deb`

修正安裝套件：`sudo apt install --fix-broken -y`

再設定一次套件：`sudo dpkg -i google-chrome-stable_current_amd64.deb`

```
ez945y@DESKTOP-MBOCTE4:/tmp$ sudo wget https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb
--2022-05-31 13:00:09-- https://dl.google.com/linux/direct/google-chrome-stable_current_amd64.deb
Resolving dl.google.com (dl.google.com)... 172.217.160.110, 2404:6800:4012:4::200e
Connecting to dl.google.com (dl.google.com)|172.217.160.110|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 84701968 (81M) [application/x-debian-package]
Saving to: 'google-chrome-stable_current_amd64.deb' t upgraded.
Need to get 685 kB of archives.
google-chrome-stable_current_ 100%[=====] 80.78M 10.2MB/s in 7.6s
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 x11-apps amd64 7.7+8 [657 kB]
2022-05-31 13:00:17 (10.6 MB/s) - 'google-chrome-stable_current_amd64.deb' saved [84701968/84701968]
Fetched 685 kB in 2s (302 kB/s)
ez945y@DESKTOP-MBOCTE4:/tmp$ sudo dpkg -i google-chrome-stable_current_amd64.deb
Selecting previously unselected package google-chrome-stable.
(Reading database ... 68636 files and directories currently installed.)
Preparing to unpack google-chrome-stable_current_amd64.deb ...
Unpacking google-chrome-stable (102.0.5005.61-1) ...
dpkg: dependency problems prevent configuration of google-chrome-stable:
 google-chrome-stable depends on fonts-liberation; however:
  Package fonts-liberation is not installed.

dpkg: error processing package google-chrome-stable (--install):
 dependency problems - leaving unconfigured
Processing triggers for gnome-menus (3.36.0-1ubuntu1) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
Errors were encountered while processing:
 google-chrome-stable
```

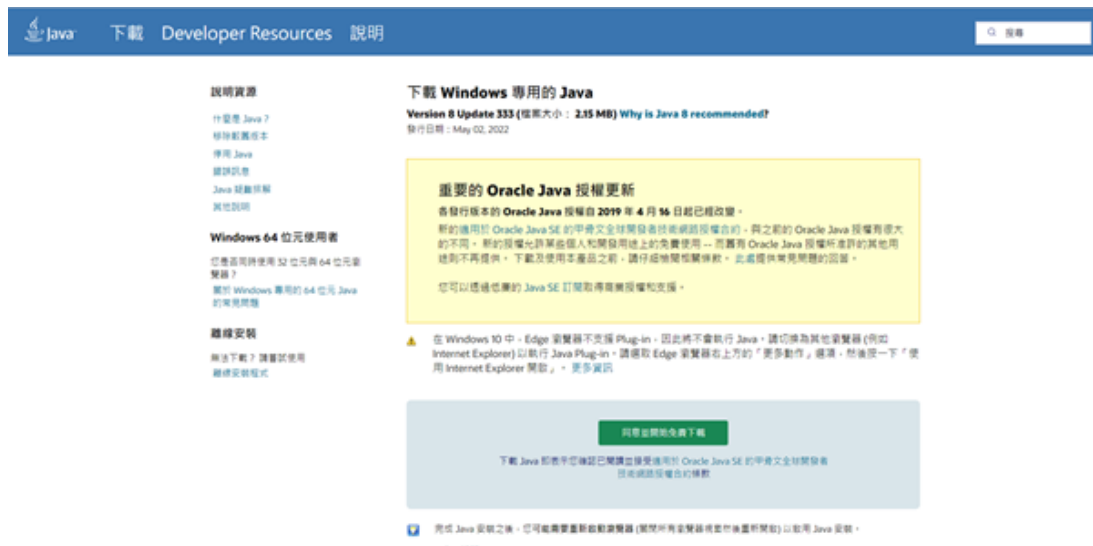
然後還是失敗了，不過還是有學到很多東西



# 肆、WebGoat

## 一、安裝流程:

### 1.下載JDK



說明資源

- 什麼是 Java ?
- 取得相關版本
- 使用 Java
- 錯誤訊息
- Java 安裝指南
- 其他說明

**Windows 64 位元使用者**

您應如何取得 32 位元與 64 位元 Java 安裝器？

關於 Windows 專用的 64 位元 Java 的常見問題

**繼續安裝**

無法下載？請嘗試使用  
繼續安裝程式

**下載 Windows 專用的 Java**

**Version 8 Update 333 (檔案大小：335 MB) Why is Java 8 recommended?**

發行日期：May 02, 2022

**重要的 Oracle Java 授權更新**

各發行版本的 Oracle Java 授權自 2019 年 4 月 16 日起已經改變。

新的適用於 Oracle Java SE 的甲骨文全球開發者技術網路授權合約，與之前的 Oracle Java 授權有重大的不同。新的授權允許某些個人和開發用途上的免費使用 -- 而舊有 Oracle Java 授權所允許的其他用途則不再提供。下載及使用本產品之前，請仔細閱讀相關條款。此處提供常見問題的解答。

您可以透過相應的 Java SE 訂閱取得商業授權和支持。

在 Windows 10 中，Edge 瀏覽器不支援 Plug-in，因此將不會執行 Java。請切換為其他瀏覽器 (例如 Internet Explorer) 以執行 Java Plug-in。請從 Edge 瀏覽器上方的「更多動作」選單，然後按一下「使用 Internet Explorer 開啟」。更多資訊

同意並開始安裝下載

下載 Java 部署平台 (JRE) 已安裝並接受適用於 Oracle Java SE 的甲骨文全球開發者技術網路授權合約條款

完成 Java 安裝之後，您可能需要重新啟動瀏覽器 (關閉所有瀏覽器視窗然後重新開啟) 以啟用 Java 安裝。

### 2.下載Webgoat



05/2021月 <>

github-actions

8.2.2 版

e75cfbe

比較

**8.2.2 版** 最新

**版本8.2.2**

**新功能**

- Docker 映像現在支援nginx流覽到 http://localhost 顯示登陸頁面。

**錯誤修復**

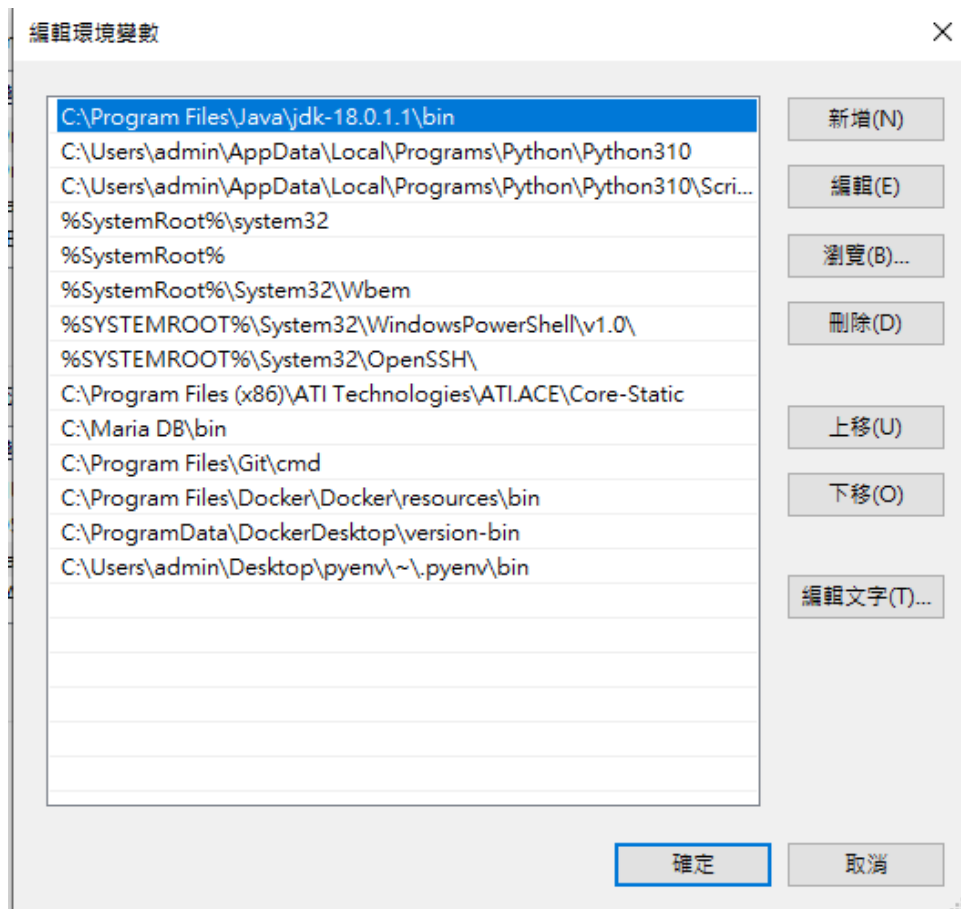
- #1039 jwt-7-代碼審查
- #1031 SQL 注入 (介紹) 5 : 數據控制語言 (DCL) 維基的解決方案不正確
- #1027 Webgoat 8.2.1 Vulnerable\_Components\_12 顯示內部伺服器錯誤

**資產** 4

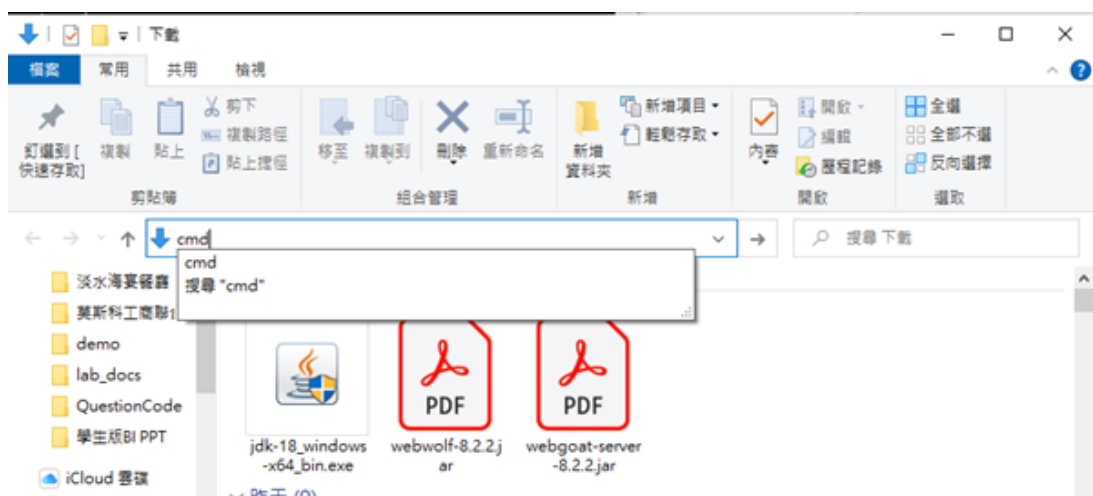
webgoat-server-8.2.2.jar	91.9 兆位元組
webgoat-server-8.2.2.jar	51.3 兆位元組
原始碼 (腳本)	
原始碼 (tar.gz)	

19 3 4 2 25人回應了

### 3.設定環境變數



#### 4. 打開終端機



#### 5. 輸入指令開啟Webgoat

```

C:\Users\admin\Downloads>java -jar webgoat-server-8.2.2.jar [--server.port=8080] [--server.address=localhost]
12:21:10.096 [main] INFO org.owasp.webgoat.StartWebGoat - Starting WebGoat with args: [--server.port=8080],[--server.address=localhost]

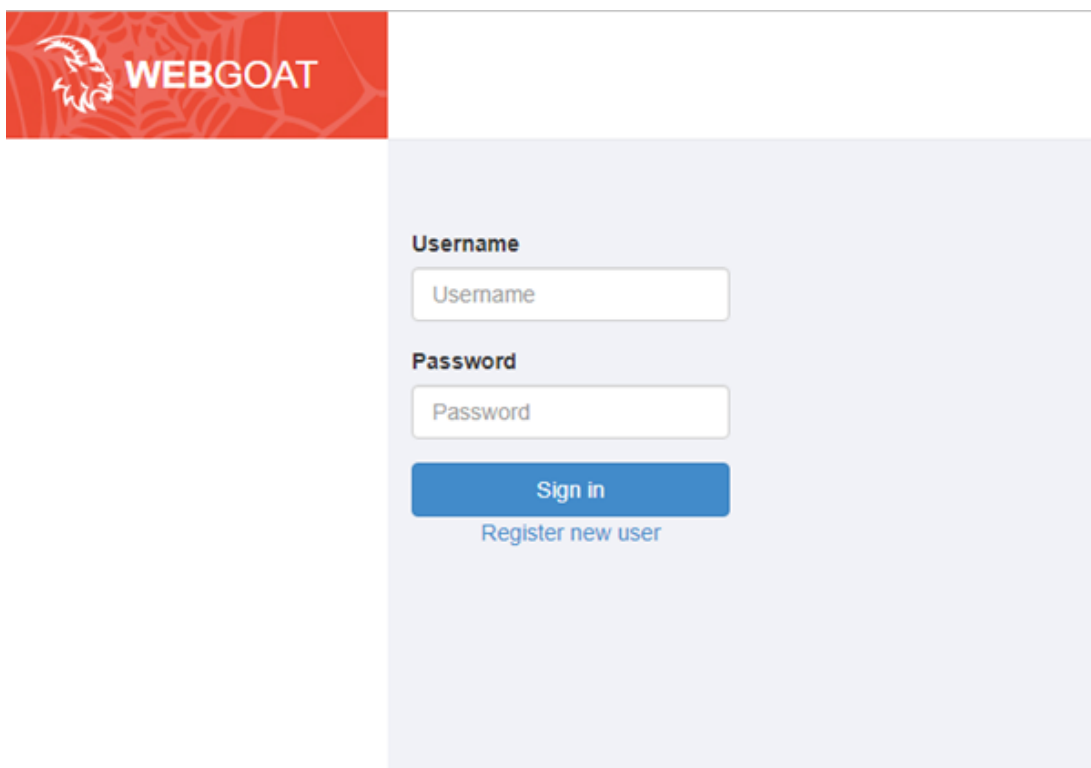
  /\_/\
 (oo)\_____)
    (____) (
       ||----w )
       ||     ||

:: Spring Boot :: (v2.4.3)

2022-05-14 12:21:11.372 INFO 6120 --- [main] org.owasp.webgoat.StartWebGoat : Starting StartWebGoat
t v8.2.2 using Java 18.0.1.1 on DESKTOP-MBOCTE4 with PID 6120 (C:\Users\admin\Downloads\webgoat-server-8.2.2.jar started
by admin in C:\Users\admin\Downloads)
2022-05-14 12:21:11.374 DEBUG 6120 --- [main] org.owasp.webgoat.StartWebGoat : Running with Spring
Boot v2.4.3, Spring v5.3.4
2022-05-14 12:21:11.375 INFO 6120 --- [main] org.owasp.webgoat.StartWebGoat : No active profile se
t, falling back to default profiles: default
2022-05-14 12:21:14.322 INFO 6120 --- [main] .s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring
Data JPA repositories in DEFAULT mode.
2022-05-14 12:21:14.524 INFO 6120 --- [main] .s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data
repository scanning in 189 ms. Found 2 JPA repository interfaces.
2022-05-14 12:21:15.463 WARN 6120 --- [main] io.undertow.websockets.jsr : UT026010: Buffer pool
l was not set on WebSocketDeploymentInfo, the default pool will be used
2022-05-14 12:21:15.487 INFO 6120 --- [main] io.undertow.servlet : Initializing Spring
EmbeddedWebApplicationContext

```

## 6. 開啟瀏覽器，輸入<http://localhost:8080/WebGoat>




The image shows the WebGoat login page. On the left, there is a red banner with a white goat head icon and the text "WEBGOAT". On the right, there is a light blue login form with the following fields and buttons:

- Username**: A text input field with the placeholder text "Username".
- Password**: A text input field with the placeholder text "Password".
- Sign in**: A blue button.
- Register new user**: A blue link below the "Sign in" button.

## 二、使用流程

### 1. 註冊帳號



## Register

Username

Password

Confirm password

Terms of use

While running this program your machine will be extremely vulnerable to attack. You should disconnect from the Internet while using this program. WebGoat's default configuration binds to localhost to minimize the exposure.

This program is for educational purposes only. If you attempt these techniques without authorization, you are very likely to get caught. If you are caught engaging in unauthorized hacking, most companies will fire you. Claiming that you were doing security research will not work as that is the first thing that all hackers claim.

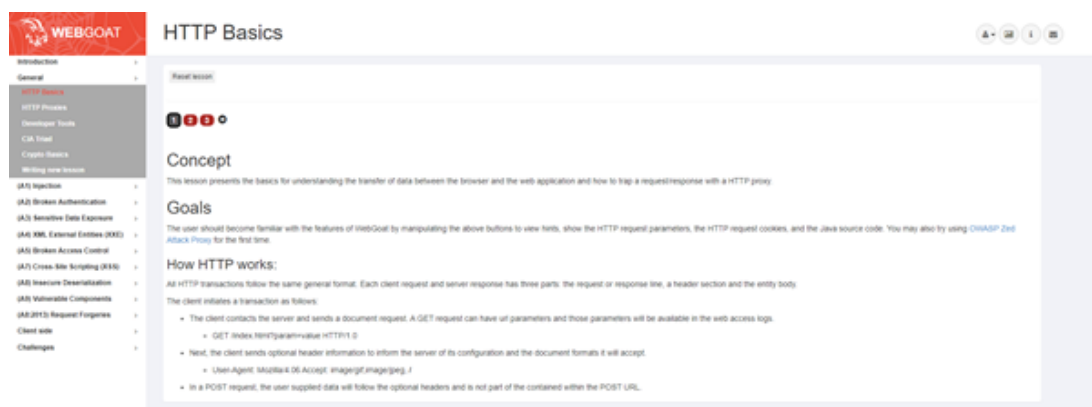
☐ Agree with the terms and conditions

Sign up

## 2.登入成功!



## 3.打開Lesson 1



## 4.第二節內容，輸入名字

Show hints

Reset lesson

←

1

2

3

→

Enter your name in the input field below and press "Go!" to su

## Try It!

Enter your name in the input field below and press "Go!" to su

Enter Your Name:

mike

Go!

### 5.當打開F12後發現是一個POST

Show hints

Reset lesson

←

1

2

3

→

Enter your name in the input field below and press "Go!" to submit. The ser

## Try It!

Enter your name in the input field below and press "Go!" to submit. The ser

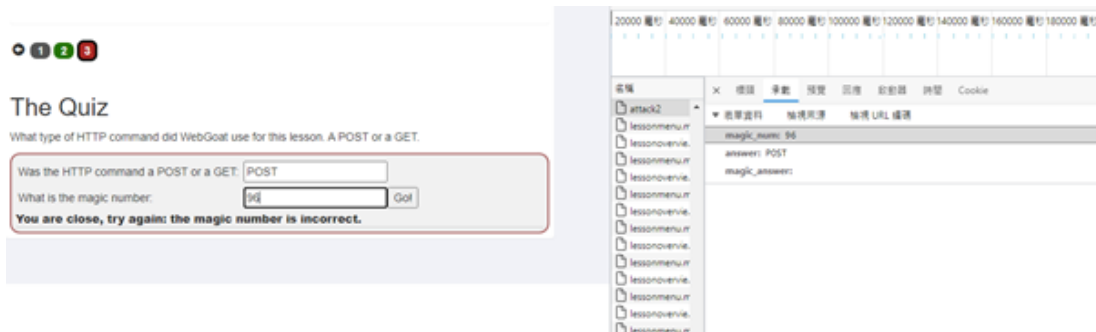
✓

Enter Your Name:

Go!

**The server has reversed your name: ekim**

### 6.查驗magic number，先送出之後觀測header



## 三、模擬Proxy

### 1.下載ZAP


幹掉

[家](#)
[博客](#)
[視頻](#)
[文件](#)
[社區](#)
[Q](#)

[下載](#)

[G](#)
[T](#)

## 下載 ZAP

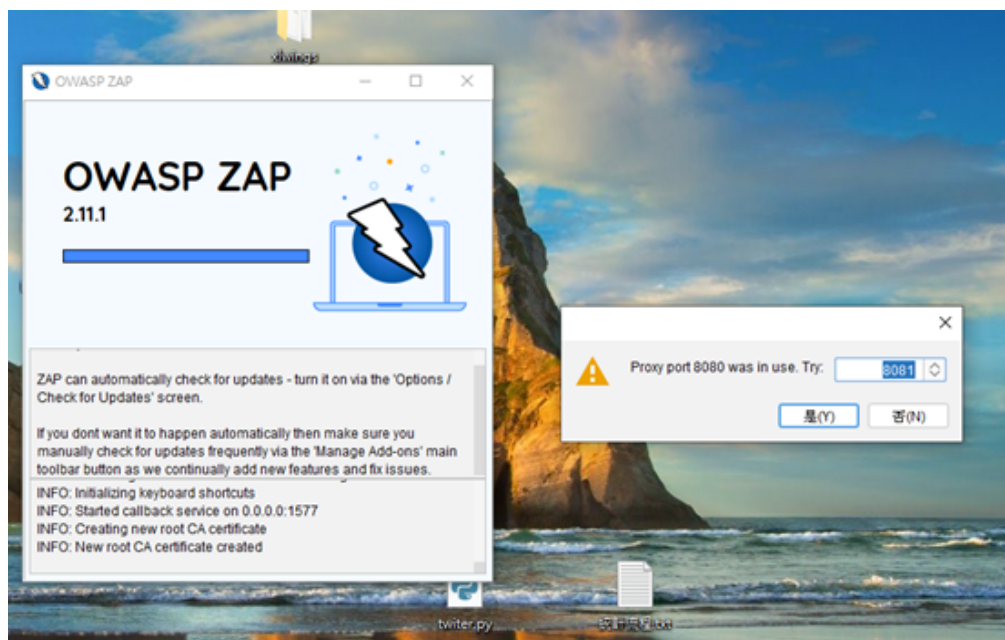
所有 ZAP 下載的校驗和都保留在 [2.11.1 發行頁面](#) 和 [相關版本](#) 中。

與所有軟體一樣，我們強烈建議僅在完全修補和積極維護的作業系統和 JRE 上安裝和使用 ZAP。

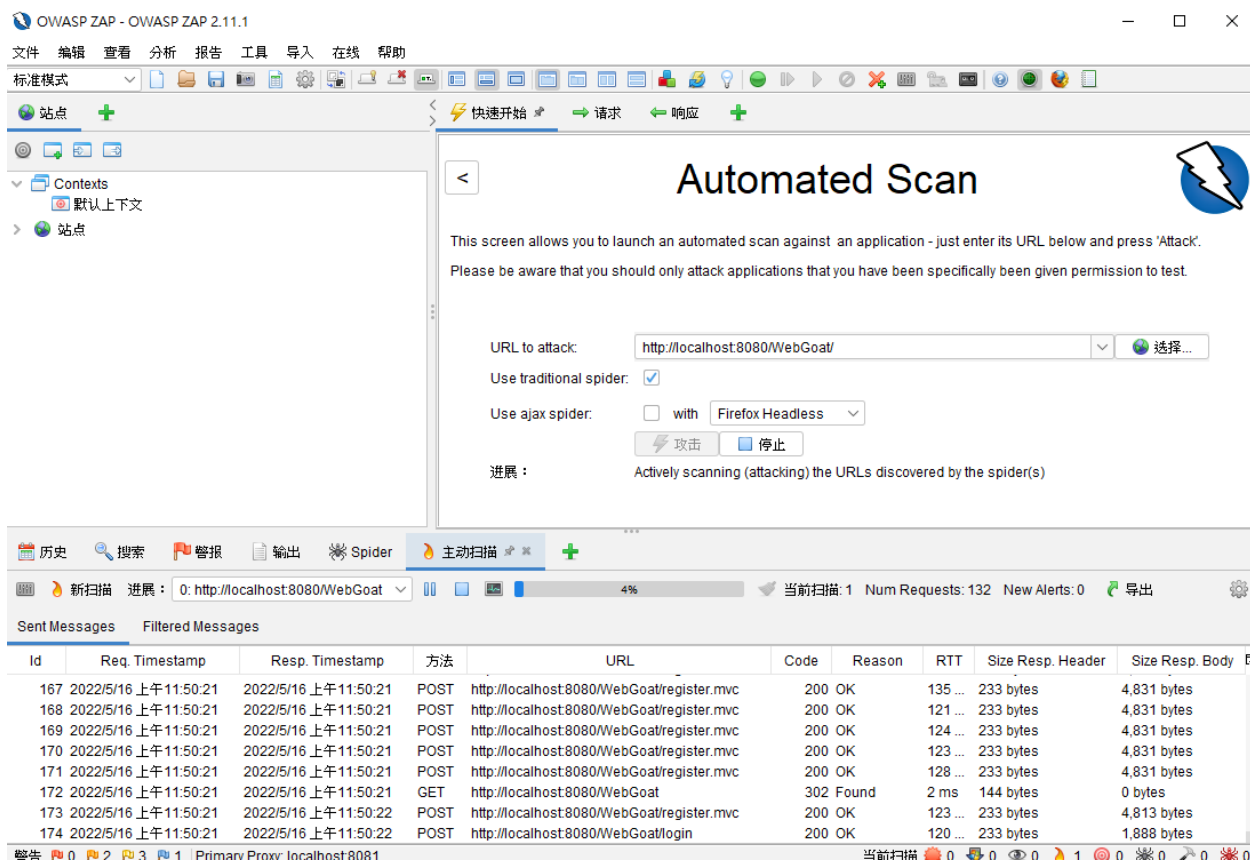
### ZAP 2.11.1

視窗（64）安裝程式	183 MB	<a href="#">下載</a>
視窗（32）安裝程式	183 MB	<a href="#">下載</a>
Linux Installer	188 MB	<a href="#">下載</a>
Linux Package	186 MB	<a href="#">下載</a>
MacOS Installer	213 MB	<a href="#">下載</a>
跨平臺包	204 MB	<a href="#">下載</a>
核心跨平台套件	55 MB	<a href="#">下載</a>

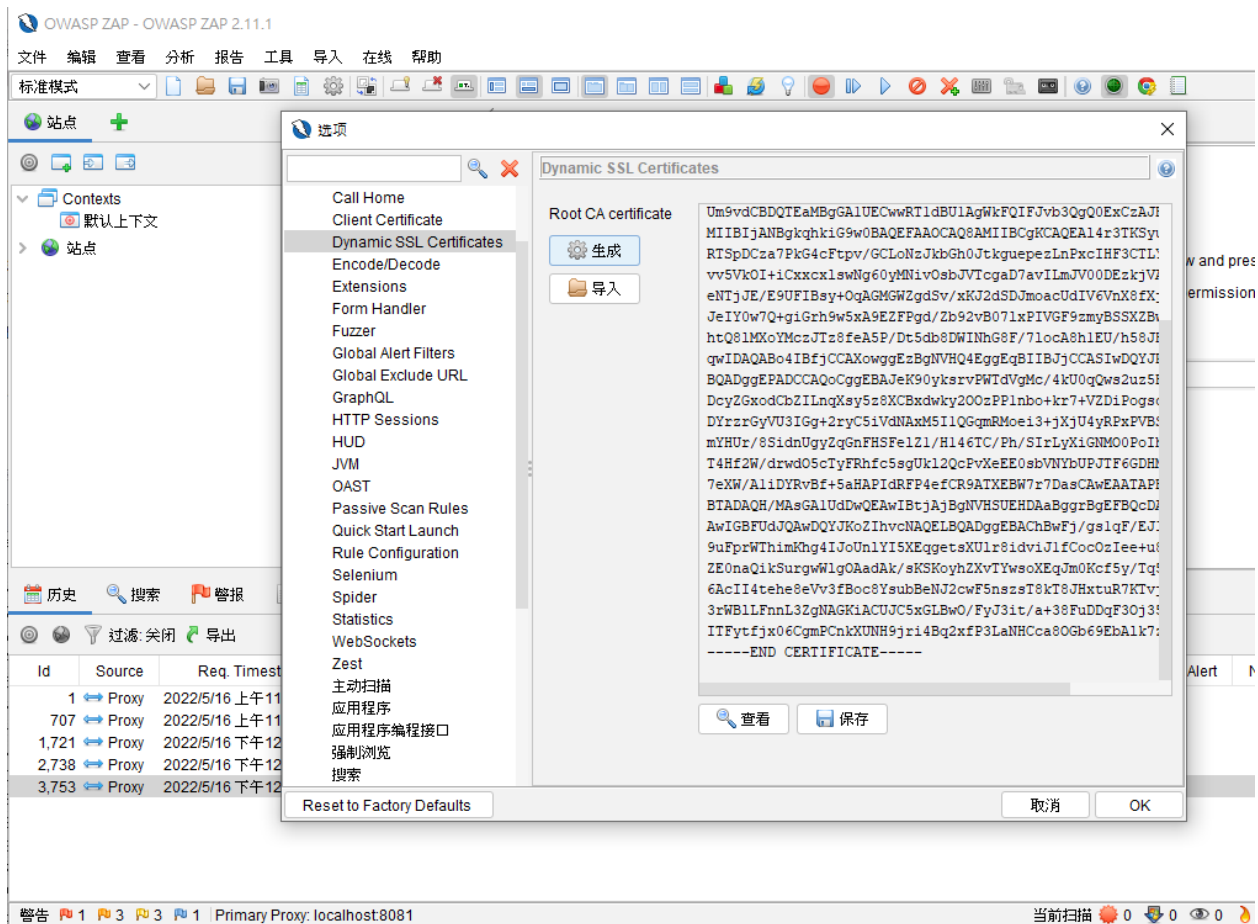
### 2.設定port為8081



### 3.打開工具裡的選項

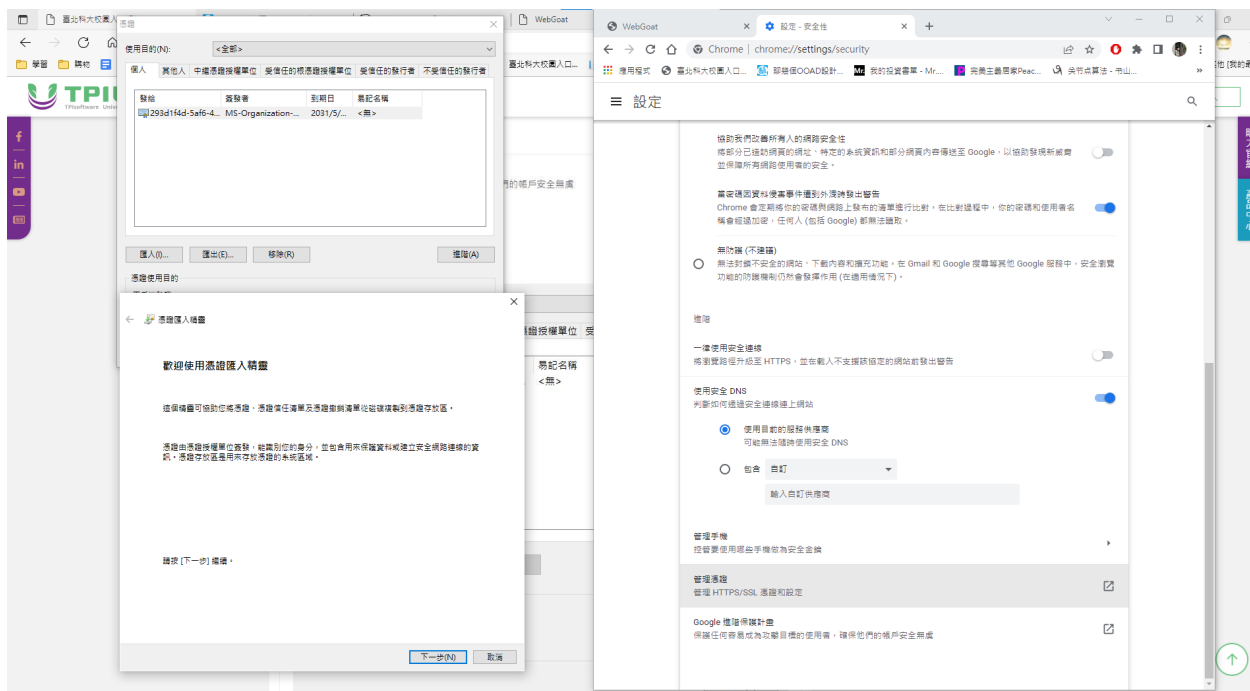


### 4.生成憑證且儲存



## 5. 打開瀏覽器 → 設定 → 安全性 → 隱私 → 憑證





## 6.選擇受信任的根憑證授權單位



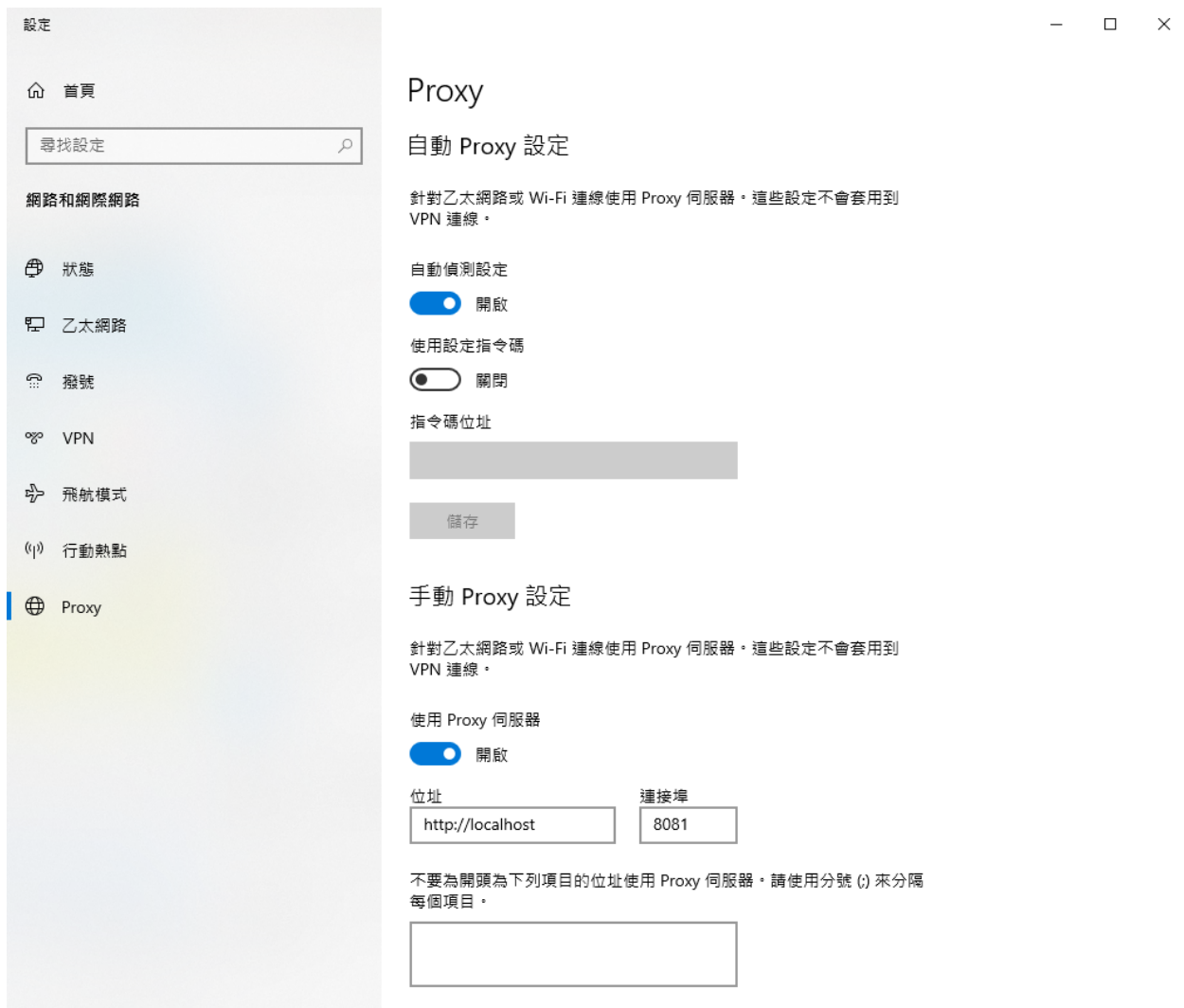
## 7. 確認無誤點擊完成



## 8.設定 → 查詢 → 開啟電腦的Proxy設定



## 9.設定為一樣的8081



# 伍、Markdown語法

H1

# 測試文字

## 測試文字

H3

## 測試文字

## 測試文字

H6

### 測試文字

## 測試文字

斜體

\*測試文字\*

*測試文字*

粗體

**\*\*測試文字\*\***

**測試文字**

刪除線

~測試文字~

測試文字

小區間

`測試文字`

測試文

大區間

/Callout

程式碼

/code

```
print("Hello World")
```

代辦

[]

□

引用

>

▼

清單

- 測試文字

+ 測試文字

\* 測試文字

- 測試文字

數字清單

1.

1.

照片

/image

字體顏色

/color

超連結

/web

目錄

/toc

![GITHUB](https "雙氣")

## 陸、參考資料

Windows PowerShell基本語法及常用命令

Windows 10 WSL GUI介面 - HackMD

[Ubuntu][教學] Linux基本指令#04. 產生空白資料夾、檔案與命名注意事項 - YouTube

鳥哥私房菜 - 第十二章、學習 Shell Scripts (vbird.org)

Bash Shell Script教學與心得 (google.com)

Shell echo命令 | 菜鸟教程 (runoob.com)

使用 WSL 執行 Linux GUI 應用程式 | Microsoft Docs

[Day 13] 來玩WebGoat！之1：安裝 - iT 邦幫忙::一起幫忙解決難題，拯救 IT 人的一天 (ithome.com.tw)

Markdown - 易編易讀，優雅的寫文吧！

筆記&寫作神器 MarkDown 真希望我學生時期就懂

Draw Diagrams With Markdown

Math and Academic Functions

為什麼許多人都改用 Notion 做為主力筆記軟體？看完這個你就明白了

## 柒、心得

由於WINDOW的關係跟老師介面不太一樣，只好去試著載WSL，安裝其實很順利，但很不清楚怎麼運行BASH，前期光要看清楚別人在幹嘛就很困難了，在做SCRIPT時更是花了很多文章，最後才總結出來，老實說我覺得網路文章真的很不詳細，而且大多都有版本差，一堆小小的差異就得要DUBUG上許久，但感覺研究之後真的清楚很多，相信未來有走程式都一定用的到LINUX，因此絕對是值得去學習的。

至於資安這部分其實真的還是有很多需要去精進的，資安的世界真的是博大精深，雖然說以後不一定會走資安，但至少學幾招在身上自己用也很好，未來也會帶給我們幫助，並且過程中一步一步去實現，克服困難後的成就感，其時我還蠻喜歡的，另外在所有之中尤其是最喜歡MARKDOWN，後來學會之後真的幾乎都不用DOC了，真是太方便太好用了，配合NOTION使用實在是太讚了，整理筆記、作業甚麼的都可以簡單做出很精美的成品，謝謝老師們