



openwrt - 入門

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安裝

如果 Hardware 的版本與 firmware 版本不同, 千萬不要硬上 !!

因為變磚了就煩了 ..



查看 Hardware 的版本:



Download

下載: <http://downloads.openwrt.org/snapshots/trunk/ar71xx/>

openwrt-<CPU 名稱>-generic-<Router 名稱>-<硬件版本>-<格式>-<用圖>

Example:

```
openwrt-ar71xx-generic-tl-wr740n-v1-squashfs-factory.bin
openwrt-ar71xx-generic-tl-wr740n-v1-jffs2-factory.bin
openwrt-ar71xx-generic-tl-wr740n-v1-squashfs-sysupgrade.bin
openwrt-ar71xx-generic-tl-wr740n-v1-jffs2-sysupgrade.bin
```

Firmware 常見的3種格式 TRX, TRX2, BIN

First Login:

當 router 安裝完 openwrt 後, 它只有 telnet 被啟動,

只有設置好root 的 pw 後, 我們才可以 ssh 它 ~

首先我們要 telnet 入去 router



```
telnet 192.168.1.1
```

設定它的 password

```
passwd
```

UCI (Unified Configuration Interface)

uci 是 openwrt 的中央設定工具, 我們可以透過它設定 router 上的一切一切

Default 是有安裝的, 除非人手刪了~

所需的packages:

- uci(/sbin/uci)
- libuci(/lib/libuci.so)

所有設定值保存在

```
/etc/config/xxx
```

常用 config file:

- /etc/config/dhcp
- /etc/config/dropbear
- /etc/config/firewall
- /etc/config/network
- /etc/config/system
- /etc/config/timeserver
- /etc/config/wireless

格式:

```
package 'example'
```

```
config 'example' 'test'  
    option 'string'      'some value'  
    option 'boolean'    '1'  
    list 'collection'   'first item'  
    list 'collection'   'second item'
```



Usage: uci <command> [arguments]

command:

commit 把修改設定值寫入 flash, 並且套用(包括 uci 及 人手修改)

show [<config>[.<section>[.<option>]]] <-- 查看設定 (compressed notation)

get <-- 查看某個設定值 (compressed notation)

changes [config]

set <config>.<section>[.<option>]=<value>

add_list <config>.<section>.<option>=<string>

delete <config>[.<section>[.<option>]]

revert <config>[.<section>[.<option>]] <-- 一日未 commit, 一日都可以 revert

export [config] <--- 匯出某"設定" (UCI syntax)

import [config]

Example:

- uci set dhcp.lan.leasetime=4h
- uci set dhcp.lan.leasetime=24h

- uci get dhcp.lan.leasetime

24h

- uci show dhcp

.....
dhcp.lan=dhcp



```
dhcp.lan.interface=lan
dhcp.lan.start=100
dhcp.lan.limit=150
dhcp.lan.lease_time=24h
.....
```

- uci changes

```
dhcp.lan.lease_time=1
dhcp.lan.lease_time=24h
```

- uci revert dhcp
- uci get dhcp.lan.lease_time

12h

- uci commit

系統現在的狀態:

```
uci -P /var/state show network.wan
```

-P <path> add a search path for config change files and use as default

次序

某些設定是有次序之分的, 比如 firewall 的 rule

所以它們有另一種格式

@rule[-1]

[-1] 代表最尾

```
root@OpenWrt:~# uci add firewall rule
root@OpenWrt:~# uci set firewall.@rule[-1].src=wan
root@OpenWrt:~# uci set firewall.@rule[-1].target=ACCEPT
root@OpenWrt:~# uci set firewall.@rule[-1].proto=tcp
root@OpenWrt:~# uci set firewall.@rule[-1].dest_port=22
root@OpenWrt:~# uci commit firewall
root@OpenWrt:~# /etc/init.d/firewall restart
```



/etc/init.d/xxx

/etc/init.d/crond ???

start 是次啟動

enable 每次 boot 機啟用 !!

詳見: <http://wiki.openwrt.org/doc/uci>

SSH(Dropbear)

設定檔:

/etc/config/dropbear

- enable <-- on
- BannerFile <-- /etc/banner
- Port <-- 22
- GatewayPorts <--- tunnel port
- Interface <-- 0.0.0.0
- RootLogin <-- default: on
- RootPasswordAuth <-- default: on

SSH From Wan:

/etc/config/firewall

```
.....  
#Allow SSH  
config rule  
    option src wan  
    option proto tcp  
    option dest_port ssh
```



option target

ACCEPT

uHTTPd

設定檔:

/etc/config/uhttpd

```

config uhttpd main
    list listen_http    0.0.0.0:80
    list listen_https   0.0.0.0:443  <----- 要安裝 uhttpd-mod-tls
    才有效
    option home         /www
    cert                /etc/uhttpd.crt
    key                 /etc/uhttpd.key
    script_timeout      60
    network_timeout     30
    index_page          index.html, index.htm, default.html,
    default.htm
    no_symlinks         0
    no_dirlists         0

```

其他功能:

Authentication areas:

Password 儲存在:

/etc/httpd.conf

在 /etc/config/uhttpd 有句 "option config /etc/httpd.conf"

設定格式:

```

.....
option realm SomeString
prefix:username:password
.....

```



建立密碼:

```
uhttpd -m mysecret
```

```
$1$BMH156vLZMVWKZbfX9oFN.
```

Example:

```
option realm Protect Luci  
/cgi-bin:tim:$1$BMH156vLZMVWKZbfX9oFN.
```

P.S.

用 # comment out

URL decoding:

```
uhttpd -d "An%20URL%20encoded%20String%21%0a"
```

最後要 /etc/init.d/uhttpd restart 才生效

OPKG(Package Manager)

網上可用的 package:

<http://downloads.openwrt.org/snapshots/trunk/ar71xx/packages>

設定檔:

```
/etc/opkg.conf
```




```
src/gz snapshots http://downloads.openwrt.org/snapshots/trunk/ar71xx/packages
dest root /
dest ram /tmp
lists_dir ext /var/opkg-lists
option overlay_root /overlay
arch all 100
# package優先次序
```

lock檔:

```
/usr/lib/opkg/lock
```

usage:

```
opkg [options...] [arguments...]
```

```
update <-- 下載可用的 package 資料( /var/opkg-lists/snapshots)
```

```
install <pkgs>
```

```
remove <pkgs>
```

```
flag <flag> <pkgs>
```

```
hold, noprune, user, ok, installed, unpacked
```

```
configure <pkgs>
```

```
upgrade <pkgs> <-- (找出 pkgs opkg list-upgradable)
```

```
# 不建議在 SquashFS partition 上使用
```

```
download <pkg> <-- 下載某 package (並沒有下載所要的依賴 package)
```

資訊:

- status [pkg|regexp]
- info [pkg|regexp]
- list [pkg|regexp] List available packages
- list-installed List installed packages
- files <pkg> <-- 這 <pkg> 有什麼 files
- search <file|regexp> <-- 這 file 是屬於什麼 package



destination for any package installation.

```
dest root /  
dest ram /tmp  
dest mnt /mnt
```

```
opkg install somepackage -d destination_name
```

Example:

```
-d ram
```

有用 options:

```
--cache <directory>
```

```
--nodeps
```

Example:

用 winscp 上載所需的 package 到 /tmp/package

```
opkg install *
```

查看依賴性:

```
opkg depends muninlite
```

```
muninlite depends on:  
    xinetd
```



Troubleshoot:

```
rm /usr/lib/opkg/lock
```

救機(password reset)

以下過程只適用於使用 SquashFS 的 openwrt router

原因是squashfs 才有 failsafe mode

Step1:

把 PC 的 network 設置為 192.168.1.2

Step2:

長 ping 192.168.1.1, 會見到以下情況

```
ping -t 192.168.1.1
```

```
Ping 192.168.1.1 (?? 32 ??????):  
??? 192.168.1.101: ??????????  
?????????  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
?????????  
?????????  
?????????  
?????????  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
??? 192.168.1.1: ???=32 time<1ms TTL=64  
.....
```



Step3:

在前段 4 次ping 到的期間按 reset 制, 之後會見到系統的 LED 狂閃

Step4:

當成功 ping 到 router 時,就可以 telnet 它 !!

此時不用 Password Login

Step5:

由於系統是在 Read-only file system, 所以要 mount_root 它 r/w

之後才可以

```
reset password
```

```
passwd
```

刪除一切設定:



`mtd -r erase rootfs_data <-- 相當於 firstboot 指令`

OR

`firstboot <-- all settings will be reseted`

Step6:

`reboot -f <--- Force reboot (init is not running)`

系統升級

我們可以用官方工具去升級router: sysupgrade

`sysupgrade [options] <image>`

options:

`-f <config>` restore configuration from .tar.gz (file or url) <--- 整個 overlayfs 來

`-n` do not save configuration over reflash

`-v` more verbose

`-c` 保留系統設定 <--- 根據 /lib/upgrade/keep.d 來保留

base-files

firewall

base-files-essential

uhttpd

自己要保留的設定就放在 /etc/sysupgrade.conf

檢查檔案的原整性:

`md5sum -c md5sums`

`-c` Check sums against list in FILEs

md5sums:

```
86c3f5da10a7f7350391c0fd191cd9b4 *openwrt-ar71xx-generic-tl-wr740n-v4-squashfs-sysupgrade.bin
```



Example:

```
md5sum -c md5sums.txt
```

```
openwrt-ar71xx-generic-tl-wr740n-v4-squashfs-sysupgrade.bin: OK
```

檢查一次 image 的完整性再 upgrade 會好 D !!

升級:

Example

```
sysupgrade -v openwrt-ar71xx-generic-tl-wr740n-v3-squashfs-sysupgrade.bin
```

Saving config files...

```
etc/sysctl.conf
```

```
etc/shells
```

```
etc/rc.local
```

```
etc/profile
```

```
etc/passwd
```

```
etc/inittab
```

```
etc/hosts
```

```
etc/group
```

```
etc/firewall.user
```

```
etc/dropbear/dropbear_rsa_host_key
```

```
etc/dropbear/dropbear_dss_host_key
```

```
etc/config/wireless
```

```
etc/config/timeserver
```

```
etc/config/system
```

```
etc/config/network
```

```
etc/config/firewall
```

```
etc/config/dropbear
```

```
etc/config/dhcp
```

```
Switching to ramdisk...
```

```
Performing system upgrade...
```

```
Unlocking firmware ...
```

```
Writing from <stdin> to firmware ...
```

```
Appending jffs2 data from /tmp/sysupgrade.tgz to firmware...TRX header
```



```
not found
Error fixing up TRX header
Upgrade completed
Rebooting system...
```

基本上是不會升級錯的 ~

```
Invalid image, hardware ID mismatch, hw:07400001 image:07400003.
Image check 'platform_check_image' failed.
```

mtd (Memory Technology Device)

mtd 是一個類似 dd 的工具來,

```
mtd [option] <command> < device /label>
```

command:

- erase <dev> erase all data on device
- write <imagefile>|- write <imagefile> (use - for stdin) to device

查看:

```
cat /proc/mtd
```

```
dev:      size  erasesize  name
mtd0: 00020000 00010000 "u-boot" <-- boot loader
mtd1: 000e5e00 00010000 "kernel" <-- firmware
mtd2: 002ea200 00010000 "rootfs" <-- firmware
mtd3: 00170000 00010000 "rootfs_data"
mtd4: 00010000 00010000 "art"
mtd5: 003d0000 00010000 "firmware"
```

裝置檔:



/dev/mtdX

Backup方式:

```
dd if=/dev/mtd0 of=/tmp/boot.backup
```

還原:

```
mtm -r write /tmp/original_firmware.bin firmware
```

LuCI

主頁: <http://luci.subsignal.org/trac>

介紹:

- web user interface
- Lua programming language
- use object-oriented libraries
- use templating
- MVC-Webframework

安裝:

```
opkg install luci
```

packages:

luci <-- Meta package 來, 它是一大堆 depends

uhttpd, luci-mod-admin-full, luci-theme-openwrt, luci-app-firewall,

luci-proto-core, luci-proto-ppp, libiwinfo-lua

luci-ssl <-- https



luci-theme-openwrt

luci-i18n-*

luci-app-*

- luci-app-firewall
- luci-app-ddns
- luci-app-ahcp
- luci-app-freifunk-policyrouting
- luci-app-multiwan
- luci-app-ntpc
- luci-app-openvpn
- luci-app-qos
- luci-app-statistics
- luci-app-samba
- luci-app-tinyproxy
- luci-app-vnstat
- luci-app-wol
- luci-app-wshaper

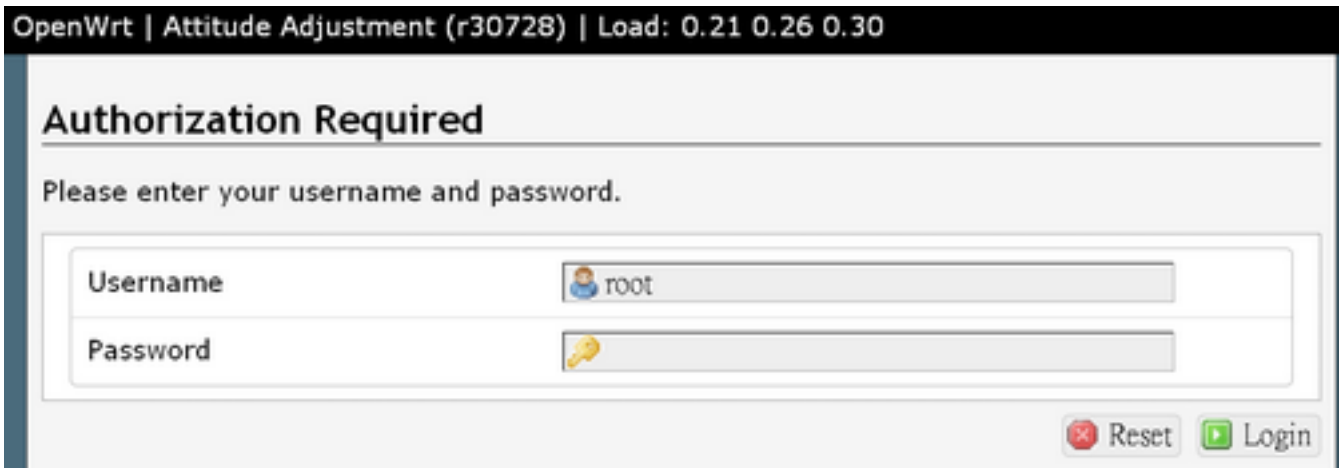
luci-proto-ppp <--- PPPoE

luci-proto-pptp

- pptp
 - ppp
 - kmod-gre
 - resolveip

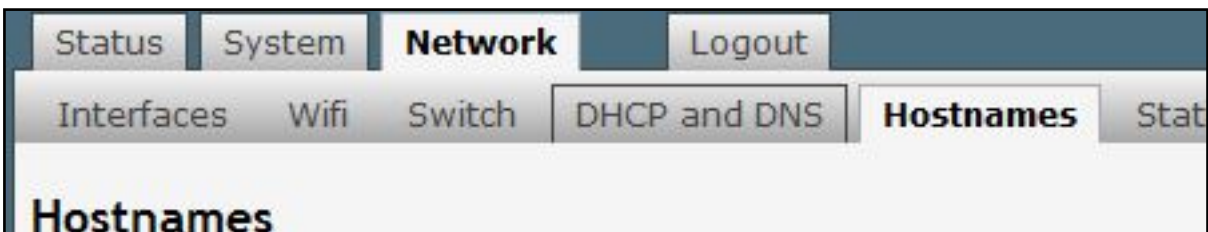
啟用:

```
/etc/init.d/uhttpd enable <-- started at every boot  
/etc/init.d/uhttpd start
```



Tips:

Hostnames:



tim-pc.lan <-- 要配合 domain 使用

Unsaved Change:

