# 利用MadWiFi實作WDS

#### 彰化師大資工所 李宏杰

101.01.02

#### WDS

- Q:什麼是WDS (Wireless Distribution System)?
- A:WDS 就是一台AP(a)透過另一台AP(b)連 到原來(a)所不能連到的地方。

一般的無線AP都號稱距離可達50-100公尺, 但是會受到建築物的影響而有所減少,如 果使用者位於超過AP的發射距離而連外只 有一條ADSL又不想另外拉線,WDS就可以派 上用場。

#### 達成WDS的必要條件

- 1. 雨個具有WDS功能的AP
- 2. 兩個AP的SSID要相同
- 3. 兩個AP使用的無線網路頻道必須相同
- 4. 兩個AP啟動WDS,並互設對方wireless MAC address
- 5. 兩個AP的安全機制必須相同

實驗環境

#### • 硬體:

(1)4台NB - Acer 4830TG \* 1 - STA1
 Acer 4720 \* 2 - AP1 & AP2
 Asus A8FM \* 1 - STA2
 (2)2張D-Link DWL-G650無線網卡

• 作業系統:

Acer 4830TG(STA1) - Ubuntu 10.04 Acer 4720(AP1) & (AP2) - Fedora core 6 AP1 MAC: 00:0f:3d:de:1d:d7 AP2 MAC: 00:0f:3d:de:1d:d0 Asus A8FM(STA2) - WinXP(只是為了證明任何系統都可成功)

#### 實驗目標

- 在WDS裡,橋接兩端的AP,藉由無線傳輸連接,即是從兩邊有線的乙太網路(802.3), 透過中間的無線傳輸(802.11)來進行溝通 使得雙方能夠互ping。
- 實驗拓樸







#### 實作WDS

要安裝Bridge控制套件 如果一開始安裝時沒點選到此套件, Fedora core 6光碟有 在->Fedora->RPMS->bridge-utils-1.1-2. i386(依你的系統版本而定,我是灌i386) 抓出來之後,執行安裝 #rpm -ivh bridge-utils-1.1-2.i386

必須安裝此套件才能使用brctl command

#### STA1的設定與運作情形

#### •初始狀態, eth0無任何IP設定

🛷 應用程式 位置 系統 🌍 国		📄 lee 🔞 📄 🧾 🛃 🧔	) 🖂 1月1日(日) 下午 11:18
lee			Ubuntu 10.04.3 LTS kernel: 2.6.32-37-genetic-pae Intel(R) Core(TM) 15-2410M CPU @ 2.30GHz
連結至 linux 連結至 simulation 運結至 src 終端機	Bee@ns2: ~     Construct a state of the state o		Load : 1.19.0.65.0.25 Ram 8% Swap 0% IP : Upload - 0.0 KB/sec Download - 0.0 KB/sec Download - 0.0 KB/sec (dev/sda1 27% /dev/sda3 4% COMMAND_USER_%CPU XorpXdev/sda3 4% COMMAND_USER_%CPU XorpXdev/sda3 4%

#### STA1的設定與運作情形

#sudo ifconfig eth0 10.1.1.1 netmask
 255.255.255.0 up

lee@ns2: ~	
檔案(E) 編輯(E) 檢視(V) 終端機(T) 求助(H)	
RX bytes:1200 (1.2 KB) TX bytes:1200 (1.2 KB)	<u>^</u>
<pre>lee@ns2:~\$ sudo ifconfig eth0 10.1.1.1 netmask 255.255.255.0 up [sudo] password for lee: lee@ns2:~\$ ifconfig eth0 Link encap:Ethernet HWaddr 08:00:27:b4:53:d6</pre>	
inet addr:10.1.1.1 Bcast:10.1.1.255 Mask:255.255.255.0	
Inet6 addr: fe80::a00:27ff:feb4:53d6/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:0 errors:0 dropped:0 overruns:0 frame:0 TX packets:22 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:0 (0.0 B) TX bytes:4908 (4.9 KB)	
<pre>lo Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:20 errors:0 dropped:0 overruns:0 frame:0 TX packets:20 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:1200 (1.2 KB) TX bytes:1200 (1.2 KB)</pre>	Ξ
lee@ns2:~\$	

#### STA2的設定與運作情形

•初始狀態



#### STA2的設定與運作情形

• 設定WinXP IP,想必大家都會

S 網路連線	
檔案(E) 編輯(E) 檢視(Y) 我的最愛(A) 工具(I) 進階(M)	說明(出) 🥂 🥂
🕜 上一頁 🔹 🕥 🖌 🎓 搜尋 🌔 資料夾 🔢	
網址(D) 🔇 網路連線	Internet Protocol (TCP/IP) 內容
	<b>宾 一般</b>
<ul> <li>初路工作</li> <li>②</li> <li>③ 建立一個新連線</li> <li>③ 設定家用或小型辦公室網</li> </ul>	如果您的網路支援這項功能,您可以取得自動指派的 IP 設定。否則,您必須詢問網路系統管理員正確的 IP 設定。
	○ 自動取得 IP 位址(0)
▲ 區域連線 內容 ? ×	● 提用下列的IP10址(3); IP 位址(1): 10 1 1 4
一般 進階	子綱路遮置(1): 255,255,0
連線使用: ■ Realtek R TL 8168/8111 PCI-E Gigabi 設定(C)	· 預設開道(D):
這個連線使用下列項目(2):	<ul> <li>○ 自動取得 DNS 伺服器位址(B)</li> <li>○ 使用下列的 DNS 伺服器位址(E):</li> </ul>
<ul> <li>Client for Microsoft Networks</li> <li>File and Printer Sharing for Microsoft Networks</li> </ul>	慣用 DNS 伺服器(P):
Packet Scheduler     Treferent Protocol (TCP/IP)	其他 DNS 伺服器 ( <u>A</u> ):
	進階(1)
/ <sup>/ 推型</sup> 傳輸控制通訊協定/網際網路通訊協定 (ICP/IP)。這是預 設的廣域網路通訊協定,提供不同網路之間的通訊能 力。	確定取消
<ul> <li>✓ 連線後,在通知區域內顯示圖示(型)</li> <li>✓ 在這個連線只有有限連線或沒有連線能力時通知我(M)</li> </ul>	
🛃 崩 始 🖌 🏉 🦉 🕑 💊 網路連線	- 画域連線 内容 🛛 👘 👹 📝 🧐 🔍 🛃 💭 👰 🛄 下午 11:27

## AP1的設定與運作情形(1/12)

編寫設定檔 #vim final\_apl. sh or #gedit final\_apl. sh echo "br0 down " ifconfig br0 down sleep 3 echo "ath0 down " ifconfig ath0 down sleep 3 echo "wdsath0 down " ifconfig wdsath0 down sleep 3 echo "wlanconfig ath0 destroy " wlanconfig ath0 destroy sleep 3 echo "wlanconfig wdsath0 destroy

## AP1的設定與運作情形(2/12)

- wlanconfig wdsath0 destroy
- sleep 3
- echo "delbr br0 '
- brctl delbr br0
- sleep 3
- echo "rmmod -w ath\_pci "
- rmmod -w ath\_pci
- sleep 3
- //以上為執行第二次以上才有作用,為device重置的意思,初次執行會無此裝置是沒關係的

#### #設定ath0無線相關設定

- echo "modprobe ath\_pci "
- modprobe ath\_pci
- sleep 3
- echo "wlanconfig ath0 destroy

## AP1的設定與運作情形(3/12)

wlanconfig ath0 destroy

sleep 3

echo "wlanconfig ath0 create wlandev wifi0 wlanmode ap " wlanconfig ath0 create wlandev wifi0 wlanmode ap sleep 3 echo "ifconfig ath0 down " ifconfig ath0 down sleep 3 echo "iwconfig ath0 essid honjie iwconfig ath0 essid honjie sleep 3 echo "iwconfig ath0 channel 10 " iwconfig ath0 channel 10 sleep 3

echo "wlanconfig wdsath<br/>0 create wlandev wifi<br/>0 wlanmode wds " $^{\rm 14}$ 

## AP1的設定與運作情形(4/12)

```
wlanconfig wdsath0 create wlandev wifi0 wlanmode wds
sleep 3
echo "ifconfig wdsath0 down "
ifconfig wdsath0 down
sleep 3
echo "iwpriv wdsath0 wds_add 00:0f:3d:de:1d:d0 "
iwpriv wdsath0 wds_add 00:0f:3d:de:1d:d0
sleep 3
echo "iwpriv wdsath0 wds 1 "
iwpriv wdsath0 wds 1
sleep 3
echo "ifconfig ath0 0.0.0.0 up "
ifconfig ath0 0.0.0.0 up
sleep 3
echo "ifconfig wdsath0 0.0.0.0 up
```

## AP1的設定與運作情形(5/12)

ifconfig wdsath0 0.0.0.0 up
sleep 3
echo "ifconfig eth0 0.0.0 up
ifconfig eth0 0.0.0 up
sleep 3

#### # 建立虛擬的br0—Bridge介面 echo "brct1 addbr br0 " brct1 addbr br0 sleep 3 echo "brct1 addif br0 ath0 " brct1 addif br0 ath0 sleep 3 echo "brct1 addif br0 wdsath0 brct1 addif br0 wdsath0

#### sleep 3

## AP1的設定與運作情形(6/12)

echo "brctl addif br0 eth0 "

brctl addif br0 eth0

sleep 3

echo "echo 1 > /proc/sys/net/ipv4/ip\_forward "

echo 1 > /proc/sys/net/ipv4/ip\_forward

sleep 3

#設定bridge的Network資訊,並將此bridge啟動 echo "ifconfig br0 10.1.1.2 netmask 255.255.255.0 up " ifconfig br0 10.1.1.2 netmask 255.255.255.0 up //以上WDS之相關設定與bridge橋接均完成

存檔並執行 #chmod 755 final\_apl.sh #sh final\_apl.sh

### AP1的設定與運作情形(7/12)

•初始狀態



### AP1的設定與運作情形(8/12)

			root	@wdsl:/	/home		×
檔案(E)	編輯Œ)	顯示♡)	終端機①	分頁(B)	求助(日)		
[root@wds [root@wds adhoc ap [root@wds 1o	sl ~]# c sl home] o.sh fi sl home] no wir	d /home/ # 1s nal_apl. # iwconf eless ex	sh ig tensions.				
eth0	no wir	eless ex	tensions.				
wifi0	no wir	eless ex	tensions.				
ath0	IEEE 8 Mode:M Bit Ra Retry: Encryp	02.11b anaged te:0 kb/ off RT tion key	ESSID:"" Channe1:0 s Tx-Pow S thr:off :off	Access ver:20 dB Fragme	Point: No Sm Sens: ent thr:o	ot-Associated itivity=1/1 ff	
	Power Link Q Rx inv Tx exc	Manageme Quality=0 alid nwi essive r	nt:off /70 Signa d:4179 Rx etries:0	1 1eve1= : invalid Invalid	≔98 dBm   crypt:0 misc:0	Noise 1eve1=-98 dBm Rx invalid frag:0 Missed beacon:0	=
sit0	no wir	eless ex	tensions.				
[root@wds	1 home]	# sh fin	a1_apl.sh				-

### AP1的設定與運作情形(9/12)

執行後結果

root@wds1:/home	
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
de1br br0	
rmmod -w ath_pci	
modprobe ath_pci	
wlanconfig ath0 destroy	
wlanconfig ath0 create wlandev wifi0 wlanmode ap	
ath0	
ifconfig ath0 down	
iwconfig ath0 essid honjie	
iwconfig ath0 channel 10	
wlanconfig wdsath0 create wlandev wifi0 wlanmode wds	
wdsath0	
ifconfig wdsath0 down	
iwpriv wdsath0 wds_add 00:0f:3d:de:ld:d0	
iwpriv wdsath0 wds 1	
ifconfig ath0 0.0.0.0 up	
ifconfig wdsath0 0.0.0.0 up	
ifconfig eth0 0.0.0.0 up	
brct1 addbr br0	
brct1 addif br0 ath0	
brct1 addif br0 wdsath0	
brct1 addif br0 eth0	
echo l > /proc/sys/net/ipv4/ip_forward	
ifconfig br0 10.1.1.2 netmask 255.255.255.0	
[root@wdsl home]#	

### AP1的設定與運作情形(10/12)

觀看網路相關設定,#ifconfig

	root@wds1:/home	
檔案(E)	編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
frootmwd ath0	<pre>dsl home]# ifconfig Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D7 inet6 addr: fe80::20f:3dff:fede:1dd7/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:0 errors:0 dropped:0 overruns:0 frame:0 TX packets:0 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueue1en:0 RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)</pre>	
br0	Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D7 inet addr:10.1.1.2 Bcast:10.1.1.255 Mask:255.255.255.0 inet6 addr: fe80::20f:3dff:fede:1dd7/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:72 errors:0 dropped:0 overruns:0 frame:0 TX packets:29 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueue1en:0 RX bytes:14082 (13.7 KiB) TX bytes:5826 (5.6 KiB)	
eth0	Link encap:Ethernet HWaddr 00:1D:72:C1:E8:63 inet6 addr: fe80::21d:72ff:fec1:e863/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:77 errors:0 dropped:0 overruns:0 frame:0 TX packets:66 errors:0 dropped:0 overruns:0 carrier:0 co11isions:0 txqueue1en:1000 RX bytes:14755 (14.4 KiB) TX bytes:13492 (13.1 KiB) Interrupt:169	
10	Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1	•

21

### AP1的設定與運作情形(11/12)

	root@wds1:/home	_ • ×
檔案(E)	編輯∈) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
	TX packets:66 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:17632 (17.2 KiB) TX bytes:13492 (13.1 KiB) Interrupt:169	
10	Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:4817 errors:0 dropped:0 overruns:0 frame:0 TX packets:4817 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:6964292 (6.6 MiB) TX bytes:6964292 (6.6 MiB)	
wdsath0	Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D7 inet6 addr: fe80::20f:3dff:fede:1dd7/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:50 errors:0 dropped:0 overruns:0 frame:0 TX packets:53 errors:0 dropped:1 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:9956 (9.7 KiB) TX bytes:11402 (11.1 KiB)	
wifiO	Link encap:UNSPEC HWaddr 00-0F-3D-DE-1D-D7-98-22-00-00-00-00-00-00-00-00 UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:207 errors:0 dropped:0 overruns:0 frame:333 TX packets:53 errors:22 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:199 RX bytes:28203 (27.5 KiB) TX bytes:12886 (12.5 KiB) Interrunt:193	

## AP1的設定與運作情形(12/12)

觀看無線網卡相關設定, #iwconfig

	root@wds1:/home	
檔案(E)	編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
ath0	IEEE 802.11g ESSID:"honjie" Mode:Master Frequency:2.457 GHz Access Point: Not-Associated Bit Rate:0 kb/s Tx-Power:20 dBm Sensitivity=1/1 Retry:off RTS thr:off Fragment thr:off Encryption key:off Power Management:off Link Quality=48/70 Signal level=-48 dBm Noise level=-96 dBm Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0 Tx excessive retries:0 Invalid misc:0 Missed beacon:0	
wdsath0	IEEE 802.11g Mode:Repeater Frequency:2.457 GHz Access Point: 00:0F:3D:DE:1D:D0 Bit Rate:0 kb/s Tx-Power:20 Sensitivity=1/1 Retry:off RTS thr:off Fragment thr:off Encryption key:off Power Management:off Link Quality=48/70 Signal level=-48 dBm Noise level=-96 dBm Rx invalid nwid:133 Rx invalid crypt:0 Rx invalid frag:0 Tx excessive retries:0 Invalid misc:0 Missed beacon:0	dBπ
br0 [root@wd	no wireless extensions.	=

#### AP2的設定與運作情形(1/7)

編寫設定檔,大致上都跟AP1一樣,只須改綠色部分,將 echo "iwpriv wdsath0 wds\_add 00:0f:3d:de:1d:d0" iwpriv wdsath0 wds\_add 00:0f:3d:de:1d:d0 改成

echo "iwpriv wdsath0 wds\_add 00:0f:3d:de:1d:d7 "
iwpriv wdsath0 wds\_add 00:0f:3d:de:1d:d7

#### 並將

echo "ifconfig br0 10.1.1.2 netmask 255.255.255.0 up " ifconfig br0 10.1.1.2 netmask 255.255.255.0 up 改成 echo "ifconfig br0 10.1.1.3 netmask 255.255.255.0 up " ifconfig br0 10.1.1.3 netmask 255.255.0 up

### AP2的設定與運作情形(2/7)

•初始狀態

🕞 應用程式 位置系統 🂼 😔 🗾		i i i i i i i i i i i i i i i i i i i	23:19 📢
		04	
	root@wds2:~		
電腦 檔案(E) 編輯(E)	顯示(V) 終端機(T) 分頁(B) 求助(E	D	
[root@wds2 ~]#			
個人資料夾			
9			
回收筒			
5			
			e
- Lat			
3			
😻 🔲 root@wds2:~	💼 準備啓動 Take Screenshot		9

### AP2的設定與運作情形(3/7)

			root	@wds2:/	home		]
檔案(E)	編輯(E)	顯示(⊻)	終端機①	分頁(B)	求助(出)		
[root@wd [root@wd adhoc f [root@wd 1o	s2 ~]# c s2 home] inal_ap2 s2 home] no wir	d /home/ # 1s .sh # iwconf eless ex	ig tensions.				
eth0	no wir	eless ex	tensions.				
wifi0	no wir	eless ex	tensions.				
ath0	IEEE 8 Mode:M Bit Ra Retry: Encryp Power Link Q Rx inv Tx exc	02.11b anaged te:0 kb/ off RT tion key Manageme uality=0 alid nwi essive r	ESSID:"" Channe1:0 s Tx-Pow S thr:off :off nt:off /70 Signa d:6361 Rx etries:0	Access er:20 dB Fragme 1 1eve1= invalid Invalid	Point: N Sm Sens ent thr:o 98 dBm crypt:0 misc:0	ot-Associated itivity=1/1 ff Noise 1eve1=-98 dBm Rx invalid frag:0 Missed beacon:0	
sit0 [root@wd	no wir s2 home]	eless ex # sh fin	tensions. a1_ap2.sh				
							 1

### AP2的設定與運作情形(4/7)

執行後結果

root@wds2:/home
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)
de1br br0
rmmod -w ath_pci
modprobe ath_pci
w1anconfig ath0 destroy
wlanconfig ath0 create wlandev wifi0 wlanmode ap
ath0
ifconfig ath0 down
iwconfig ath0 essid honjie
iwconfig ath0 channel 10
wlanconfig wdsath0 create wlandev wifi0 wlanmode wds
wdsath0
ifconfig wdsath0 down
iwpriv wdsath0 wds_add 00:0f:3d:de:ld:d7
iwpriv wdsathU wds I
ifconfig atho 0.0.0.0 up
ifconfig wdsatho 0.0.0.0 up
hrct1 addbr br0
brett addif brû stbû
breti addif brû wdsatbû
bret1 addif br0 eth0
echo 1 > /proc/sys/net/ipy4/ip forward
ifconfig br0 10.1.1.3 netmask 255.255.0
[root@wds2 home]#

### AP2的設定與運作情形(5/7)

觀看網路相關設定,#ifconfig

	root@wds2:/home	
檔案(E)	編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
[root@wd	ls2 home]# ifconfig	
ath0	Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D0	
	inet6 addr: fe80::20f:3dff:fede:1dd0/64 Scope:Link	
	UP BROADCASI RUNNING MULIICASI MIU:1500 Metric:1	
	RX packets:0 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:0 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:0	
	RX bytes:0 (0.0 b)   TX bytes:0 (0.0 b)	
br0	Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D0	
	inet addr:10.1.1.3 Bcast:10.1.1.255 Mask:255.255.255.0	
	inet6 addr: fe80::20f:3dff:fede:1dd0/64 Scope:Link	
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1	
	RX packets:0 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:25 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:0	
	RX bytes:0 (0.0 b) TX bytes:5330 (5.2 KiB)	
eth0	Link encap:Ethernet HWaddr 00:1D:72:C1:EF:39	
	inet6 addr: fe80::21d:72ff:fec1:ef39/64 Scope:Link	
	UP BROADCAST RUNNING MULTICAST MIU:1500 Metric:1	
	RX packets:2 errors:0 dropped:0 overruns:0 frame:0	
	1% packets:26 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:1000	•

28

## AP2的設定與運作情形(6/7)

	root@wds2:/home 📃 🗖	X
檔案(E)	編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
	UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:4345 errors:0 dropped:0 overruns:0 frame:0 TX packets:4345 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:6299612 (6.0 MiB) TX bytes:6299612 (6.0 MiB)	
wdsath0	Link encap:Ethernet HWaddr 00:0F:3D:DE:1D:D0 inet6 addr: fe80::20f:3dff:fede:1dd0/64 Scope:Link	
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:3 errors:0 dropped:0 overruns:0 frame:0 TX packets:17 errors:0 dropped:1 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:1026 (1.0 KiB) TX bytes:3439 (3.3 KiB)	
wifi0 -00	Link encap:UNSPEC HWaddr 00-0F-3D-DE-1D-D0-98-D0-00-00-00-00-00-00-00-00-00-00-00-00-	
Incotand	e2 home]#	

## AP2的設定與運作情形(7/7)

觀看無線網卡相關設定, #iwconfig

	root@wds2:/home		X
檔案(E)	編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)		
ath0	IEEE 802.11g ESSID:"honjie"		
	Mode:Master Frequency:2.457 GHz Access Point: Not-Associated		
	Bit Rate:0 kb/s 1x-Power:20 dBm Sensitivity=1/1		
	Encryption key:off		
	Power Management:off		
	Link Quality=57/70 Signal level=-39 dBm Noise level=-96 dBm		
	Rx invalid nwid:0 Rx invalid crypt:0 Rx invalid frag:0		
	Tx excessive retries:0 Invalid misc:0 Missed beacon:0		
(wdsath()	IFEE 802 llg Mode:Repeater Frequency:2 457 GHz		
WUSACHO	Access Point: 00:0F:3D:DE:1D:D7 Bit Rate:0 kb/s Tx-Power:20	dBm	
	Sensitivity-1/1		
	Retry:off RTS thr:off Fragment thr:off		
	Encryption key:off		
	Fower Management:011 Link Quality=57/70 Signal laval=-20 dBm Noice laval=-06 dBm		
	Rx invalid nwid:34 Rx invalid crvnt:0 Rx invalid frag:0		
	Tx excessive retries:0 Invalid misc:0 Missed beacon:0		
br0	no wireless extensions.		=
[root@wde	2 home]#		



#### • STA1(10.1.1.1) ping AP1(10.1.1.2)

	lee@ns2: ~	
檔案( <u>F</u> )	編輯( <u>E)</u> 檢視(⊻) 終端機( <u>T</u> ) 求助( <u>H</u> )	
eth0	Link encap:Ethernet HWaddr 08:00:27:b4:53:d6 inet addr:10.1.1.1 Bcast:10.1.1.255 Mask:255.255.255.0	
	UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1	
	RX packets:87 errors:0 dropped:0 overruns:0 frame:0	
	TX packets:56 errors:0 dropped:0 overruns:0 carrier:0	
	collisions:0 txqueuelen:1000	
	RX bytes:16176 (16.1 KB) TX bytes:8016 (8.0 KB)	
lo	Link encap:Local Loopback	
	inet addr:127.0.0.1 Mask:255.0.0.0	
	inet6 addr: ::1/128 Scope:Host	
	UP LOOPBACK RUNNING MTU:16436 Metric:1	
	RX packets:20 errors:0 dropped:0 overruns:0 trame:0	
	collisions: 0 traveuelen: 0	
	RX bytes: 1200 (1.2 KB) TX bytes: 1200 (1.2 KB)	
lee@ns2:	~\$ ping 10.1.1.2	
PING 10.	1.1.2 (10.1.1.2) 56(84) bytes of data.	
64 bytes	from 10.1.1.2: icmp_seq=1 ttl=64 time=0.678 ms	_
64 bytes	from 10.1.1.2: icmp_seq=2 ttl=64 time=0.799 ms	
64 bytes	from 10.1.1.2: icmp_seq=3 ttl=64 time=0.811 ms	
		$\sim$



#### • STA1(10.1.1.1) ping AP2(10.1.1.3)

	lee@ns2: ~	
檔案( <u>E</u> )	編輯(E) 檢視(V) 終端機(T) 求助(H)	
eth0	Link encap:Ethernet HWaddr 08:00:27:b4:53:d6 inet addr:10.1.1.1 Bcast:10.1.1.255 Mask:255.255.255.0	
lo	<pre>Inet6 addr: Te80::a00:2/TT:TeD4:53d6/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:136 errors:0 dropped:0 overruns:0 frame:0 TX packets:104 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:21087 (21.0 KB) TX bytes:12664 (12.6 KB) Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:20 errors:0 dropped:0 overruns:0 frame:0 TX packets:20 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:1200 (1.2 KB) TX bytes:1200 (1.2 KB)</pre>	
lee@ns2:	~\$ ping 10.1.1.3	
PING 10. 64 bytes	1.1.5 (10.1.1.5) 56(84) Dytes of data. from 10 1 1 3, icmp sed=1 ttl=64 time=1 58 ms	
64 bytes	from 10.1.1.3: icmp_seq=2 ttl=64 time=1.16 ms	
64 bytes	s from 10.1.1.3: icmp_seq=3 ttl=64 time=1.31 ms	=



#### • STA1(10.1.1.1) ping STA2(10.1.1.4)

	lee@ns2: ~	
檔案( <u>E</u> )	編輯(E) 檢視(V) 終端機(T) 求助(H)	
eth0	Link encap:Ethernet HWaddr 08:00:27:b4:53:d6 inet addr:10.1.1.1 Bcast:10.1.1.255 Mask:255.255.0	
lo	<pre>inet6 addr: Te80::a00:2/TT:TeD4:53d6/64 Scope:Link UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1 RX packets:183 errors:0 dropped:0 overruns:0 frame:0 TX packets:149 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:1000 RX bytes:26006 (26.0 KB) TX bytes:16962 (16.9 KB) Link encap:Local Loopback inet addr:127.0.0.1 Mask:255.0.0.0 inet6 addr: ::1/128 Scope:Host UP LOOPBACK RUNNING MTU:16436 Metric:1 RX packets:20 errors:0 dropped:0 overruns:0 frame:0 TX packets:20 errors:0 dropped:0 overruns:0 carrier:0 collisions:0 txqueuelen:0 RX bytes:1200 (1.2 KB) TX bytes:1200 (1.2 KB)</pre>	
lee@ns2:	** ping 10.1.1.4	
64 bytes	from 10.1.1.4: icmp_seq=1 ttl=128 time=4.80 ms	
64 bytes 64 bytes	s from 10.1.1.4: icmp_seq=2 ttl=128 time=1.69 ms s from 10.1.1.4: icmp_seq=3 ttl=128 time=1.66 ms	=
		$\sim$



#### • STA1(10.1.1.1) arp 與 route table

			lee@ns2: ~						X
檔案( <u>F</u> ) 編輯( <u>E</u> )	檢視(⊻)	終端機( <u>T</u> )	求助( <u>H</u> )						
<pre>lee@ns2:~\$ arp</pre>	- n								$\frown$
Address		HWtype	HWaddress		Flags	Mask		Iface	
10.1.1.4		ether	00:18:f3:5f:43	3:3a	С			eth0	
10.1.1.2		ether	00:0f:3d:de:10	d:d7	С			eth0	
10.1.1.3		ether	00:0f:3d:de:10	d:d0	С			eth0	
Lee@nsz: \$ rout	te -n								
Kernel IP rout	iNg table								
Destination	Gateway		Genmask	Flag	s Metr	ic Ref	Use	Iface	
10.1.1.0	0.0.0.0		255.255.255.0	U	0	0	0	eth0	
Lee@ns2: \$									
									-
									=
									Č.



- AP1(10.1.1.2) ping STA1(10.1.1.1)
- AP1(10.1.1.2) ping AP2(10.1.1.3)
- AP1(10.1.1.2) ping STA2(10.1.1.4)

root@wds1:~	
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
[root@wdsl ~]# ping 10.1.1.1 PING 10.1.1.1 (10.1.1.1) 56(84) bytes of data. 64 bytes from 10.1.1.1: icmp_seq=1 tt1=64 time=0.889 ms 64 bytes from 10.1.1.1: icmp_seq=2 tt1=64 time=0.745 ms	
10.1.1.1 ping statistics 2 packets transmitted, 2 received, 0% packet 1oss, time 999ms rtt min/avg/max/mdev = 0.745/0.817/0.889/0.072 ms root@wds1 ]# ping 10.1.1.3 PING 10.1.1.3 (10.1.1.3) 56(84) bytes of data. 64 bytes from 10.1.1.3: icmp_seq=1 tt1=64 time=0.508 ms 64 bytes from 10.1.1.3: icmp_seq=2 tt1=64 time=0.518 ms	
10.1.1.3 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 999ms rtt_min/avg/max/mdev = 0.508/0.513/0.518/0.005 ms [root@wdsl~]# ping 10.1.1.4 PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data. 64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=0.733 ms 64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.790 ms 10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 999ms	
rtt min/avg/max/mdev = 0.733/0.761/0.790/0.039 ms root@wdsl ]# arp -n	
Nucless         mutype         maddress         Frags         Mask         frace           10.1.1.4         ether         00:18:F3:5F:43:3A         C         br0           10.1.1.1         ether         08:00:27:B4:53:D6         C         br0           10.1.1.3         ether         00:0F:3D:DE:1D:D0         C         br0           [root@wds1<]ff	=



#### • AP1(10.1.1.2) arp 與 route table

root@wds1;~	• ×			
構案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)				
64 bytes from 10.1.1.1: icmp_seq=2 tt1=64 time=0.745 ms	-			
10.1.1.1 ping statistics				
2 packets transmitted, 2 received, 0% packet loss, time 999ms				
[root@wds] ~]# ping 10 1.1.3				
PING 10.1.1.3 (10.1.1.3) 56(84) bytes of data.				
64 bytes from 10.1.1.3: icmp_seq=1 tt1=64 time=0.508 ms				
64 bytes from 10.1.1.3: icmp_seq=2 tt1=64 time=0.518 ms				
10.1.1.3 ping statistics				
z packets transmitted, z received, 0% packet loss, time 999ms				
[root@wds] ~]# ping 10 1.1.4				
PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data.				
64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=0.733 ms				
64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.790 ms				
10.1.1.4 ping statistics				
z packets transmitted, z received, 0% packet loss, time 999ms				
rootwudsl ~ # arp -p				
Address HWtype HWaddress F1ags Mask Iface				
10.1.1.4 ether 00:18:F3:5F:43:3A C br0				
10.1.1.1 ether 08:00:27:B4:53:D6 C br0				
10.1.1.3 ether 00:0F:3D:DE:1D:D0 C br0				
[root@wdsl ~]# route -n				
Kernel IP routing table				
Destination Gateway Genmask Flags Metric Kei Use Iface				
[root@wds] ~ #				



- AP2(10.1.1.3) ping STA1(10.1.1.1)
- AP2(10.1.1.3) ping AP1(10.1.1.2)
- AP2(10.1.1.3) ping STA2(10.1.1.4)

檔案() 編輯() 顯示(火) 然端桃() 分頁() 求助(小)         Proot&wds2 home ]# ping 10.1.1.1         PING 10.1.1.1 (10.1.1.1) 56(84) bytes of data.         64 bytes from 10.1.1.1: icmp_seq=21 ttl=64 time=1.38 ms         64 bytes from 10.1.1.1: icmp_seq=2 ttl=64 time=1.34 ms         10.1.1.1 ping statistics         2 packets transmitted, 2 received, 0% packet loss, time 999ms         rtt min/avg/max/mdev = 1.346/1.363/1.380/0.017 ms         froot@wds2 home ]# ping 10.1.1.2         PING 10.1.1.2 (10.1.1.2) 56(84) bytes of data.         64 bytes from 10.1.1.2: icmp_seq=2 ttl=64 time=0.512 ms         64 bytes from 10.1.1.2: icmp_seq=2 ttl=64 time=0.578 ms         10.1.1.2 ping statistics         2 packets transmitted, 2 received, 0% packet loss, time 999ms         rtt min/avg/max/mdev = 0.512/0.545/0.578/0.033 ms         root@wds2 home ]# ping 10.1.1.4         PING 10.1.1.4 (10.1.1.4) 1.56(84) bytes of data.         64 bytes from 10.1.1.4 icmp_seq=1 ttl=128 time=0.268 ms         10.1.1.4 ping statistics         2 packets transmitted, 2 received, 0% packet loss, time 1002ms         rtt min/avg/max/mdev = 0.288/1.534/2.801/1.267 ms         root@wds2 home ]# arp -n         Address       HWtype HWaddress       Flags Mask       Iface         root@wds2 home ]# arp -n       Oviels:F3:5F:43:3A C       br0         10.1.1.4			root@wds2:	/home				×
Proot&wds2 home  # ping 10.1.1.1         PING 10.1.1.1 (10.1.1.1) 56(84) bytes of data.         64 bytes from 10.1.1.1: icmp_seq=1 tt1=64 time=1.38 ms         64 bytes from 10.1.1.1: icmp_seq=2 tt1=64 time=1.34 ms	檔案(E) 編輯(E) 顯示(V)	終端機(T) 分頁(B)	求助(出)					
10.1.1.1 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 999ms rtt min/avg/max/mdev = 1.346/1.363/1.380/0.017 ms root&wds2 home  # ping 10.1.1.2 PING 10.1.1.2 (10.1.1.2) 56(84) bytes of data. 64 bytes from 10.1.1.2: icmp_seq=1 tt1=64 time=0.512 ms 64 bytes from 10.1.1.2: icmp_seq=2 tt1=64 time=0.578 ms 10.1.1.2 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 999ms rtt min/avg/max/mdev = 0.512/0.545/0.578/0.033 ms root&wds2 home  # ping 10.1.1.4 PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data. 64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms 64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms 10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 1002ms rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms (root&wds2 home  # arp -n Address HWtype HWaddress Flags Mask Iface 10.1.1.2 ether 00:0F:3D:DE:1D:D7 C br0 10.1.1.4 ether 08:00:27:E4:33:D6 C br0 10.1.1.4 ether 08:00:27:E4:33:D6 C br0 10.1.1.4 ether 08:00:27:E4:33:D6 C br0 10.1.1.4 ether 08:00:27:E4:33:D6 C br0	[root@wds2 home]# ping PING 10.1.1.1 (10.1.1.1) 64 bytes from 10.1.1.1: 64 bytes from 10.1.1.1:	10.1.1.1 ) 56(84) bytes of c icmp_seq=1 tt1=64 icmp_seq=2 tt1=64	ata. time=1.38 ms time=1.34 ms					
64 bytes from 10.1.1.2: icmp_seq=1 tt1=64 time=0.512 ms 64 bytes from 10.1.1.2: icmp_seq=2 tt1=64 time=0.578 ms 10.1.1.2 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 999ms rtt min/avg/max/mdev = 0.512/0.545/0.578/0.033 ms root@wds2 home]# ping 10.1.1.4 PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data. 64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms 64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms 10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 1002ms rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms root@wds2 home]# arp -n Address HWtype HWaddress Flags Mask Iface 10.1.1.2 ether 00:0F:3D:DE:1D:D7 C br0 10.1.1.1 ether 08:00:27:B4:53:D6 C br0 10.1.1.4 ether 00:18:F3:5F:43:3A C br0 root@wds2 home]#	10.1.1.1 ping statis 2 packets transmitted, 2 rtt min/avg/max/mdev = 2 [root@wds2 home]# ping PING 10.1.1.2 (10.1.1.2]	stics 2 received, 0% pack 1.346/1.363/1.380/( 10.1.1.2 ) 56(84) bytes of (	et loss, time 9 0.017 ms ata.	99ms				
2 packets transmitted, 2 received, 0% packet loss, time 999ms rtt min/avg/max/mdev = 0.512/0.545/0.578/0.033 ms (root@wds2 home]# ping 10.1.1.4 PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data. 64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms 64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms 10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 1002ms rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms (root@wds2 home]# arp -n Address HWtype HWaddress F1ags Mask Iface 10.1.1.2 ether 00:0F:3D:DE:1D:D7 C br0 10.1.1.1 ether 08:00:27:B4:53:D6 C br0 10.1.1.4 ether 00:18:F3:5F:43:3A C br0 10.1.1.4 ether 00:18:F3:5F:43:3A C br0	64 bytes from 10.1.1.2: 64 bytes from 10.1.1.2: 10.1.1.2 ping statis	icmp_seq=l tt1=64 icmp_seq=2 tt1=64 stics	time=0.512 ms time=0.578 ms					I
64 bytes from 10.1.1.4 (10.1.1.4) 50(84) bytes of data.         64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms         64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms         10.1.1.4 ping statistics         2 packets transmitted, 2 received, 0% packet loss, time 1002ms         rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms         (root@wds2 home]# arp -n         Address       HWtype HWaddress         Flags Mask       Iface         10.1.1.2       ether 00:0F:3D:DE:1D:D7 C       br0         10.1.1.1       ether 08:00:27:B4:53:D6 C       br0         10.1.1.4       ether 00:18:F3:5F:43:3A C       br0	2 packets transmitted, 2 rtt min/avg/max/mdev = ( [root@wds2 home]# ping	2 received, 0% pack 0.512/0.545/0.578/( 10.1.1.4	et loss, time 9 .033 ms	99ms				
10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet 10ss, time 1002ms rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms root@wds2 home]# arp -n Address HWtype HWaddress Flags Mask Iface 10.1.1.2 ether 00:0F:3D:DE:1D:D7 C br0 10.1.1.1 ether 08:00:27:B4:53:D6 C br0 10.1.1.4 ether 00:18:F3:5F:43:3A C br0 root@wds2 home]#	64 bytes from 10.1.1.4: 64 bytes from 10.1.1.4: 64 bytes from 10.1.1.4:	PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data. 64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms 64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms						
Address         HWtype         HWaddress         Flags Mask         Iface           10.1.1.2         ether         00:0F:3D:DE:1D:D7         C         br0           10.1.1.1         ether         08:00:27:B4:53:D6         C         br0           10.1.1.4         ether         00:18:F3:5F:43:3A         C         br0	10.1.1.4 ping statistics 2 packets transmitted, 2 received, 0% packet loss, time 1002ms rtt min/avg/max/mdev = 0.268/1.534/2.801/1.267 ms							
10.1.1.2     ether     00:0F:3D:DE:1D:D7     C     br0       10.1.1.1     ether     08:00:27:B4:53:D6     C     br0       10.1.1.4     ether     00:18:F3:5F:43:3A     C     br0	Address	HWtype HWaddress	F1ag	s Mask	Iface			
10.1.1.4 ether 00:18:F3:5F:43:3A C br0	10.1.1.1	ether 00:0F:3D: ether 08:00:27	DE:1D:D7 C B4:53:D6 C		br0 br0			
	10.1.1.4 [root@wds2 home]#	ether 00:18:F3:	5F:43:3A C		br0			



#### • AP2(10.1.1.3) arp 與 route table

root@wds2:/home	X
檔案(E) 編輯(E) 顯示(V) 終端機(T) 分頁(B) 求助(H)	
64 bytes from 10.1.1.1: icmp_seq=2 tt1=64 time=1.34 ms	
10.1.1.1 ping statistics	
2 packets transmitted, 2 received, 0% packet loss, time 999ms	
rtt min/avg/max/mdev = 1.340/1.303/1.380/0.017 ms	
PING 10.1.1.2 (10.1.1.2) 56(84) bytes of data.	
64 bytes from 10.1.1.2: icmp seq=1 tt1=64 time=0.512 ms	
64 bytes from 10.1.1.2: icmp_seq=2 tt1=64 time=0.578 ms	
10.1.1.2 ping statistics	
2 packets transmitted, 2 received, 0% packet loss, time 999ms	
[root@wds2 home]# ping 10 1 1 4	
PING 10.1.1.4 (10.1.1.4) 56(84) bytes of data.	
64 bytes from 10.1.1.4: icmp_seq=1 tt1=128 time=2.80 ms	
64 bytes from 10.1.1.4: icmp_seq=2 tt1=128 time=0.268 ms	
10.1.1.4 ping statistics	
2 packets transmitted, 2 received, 0% packet loss, time 1002ms	
rtt min/avg/max/mdev = 0.208/1.334/2.801/1.207 ms	
Address HWtype HWaddress Flags Mask Iface	
10.1.1.2 ether 00:0F:3D:DE:1D:D7 C br0	
10.1.1.1 ether 08:00:27:B4:53:D6 C br0	
10.1.1.4 ether 00:18:F3:5F:43:3A C br0	
[root@wds2 home]# route -n	
Kernel IP routing table	
Destination Gateway Genmask Flags Metric Ref Use Iface	
0.1.1.0 0.0.0.0 255.255.255.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	



#### • STA2(10.1.1.4) ping STA1(10.1.1.1)

🖭 C:\WI	INDOWS\system32\cmd.exe	. 🗆 🗙
	Connection-specific DNS Suffix . : Description Realtek RTL8168/8111 PCI-E Gigabi	.t E
thernet	NIC Physical Address $= 100-18-E3-5E-43-30$	
	Ingsical nutress:       Image: State of the	
	Default Gateway	
2: Docu	ments and Settings\lin6>ping 10.1.1.1	
Pinging	10.1.1.1 with 32 bytes of data:	
Reply f	rom 10.1.1.1: bytes=32 time=1ms TTL=64	
Reply f	rom 10.1.1.1: bytes=32 time=1ms TTL=64	
Reply f	rom 10.1.1.1: bytes=32 time=1ms TTL=64	
Ping_st	atistics for 10.1.1.1:	
Pac	kets: Sent = 4, Received = 4, Lost = 0 (0% loss), mate wound twin times in milli-seconds:	
Min	imum = 1ms, Maximum = 2ms, Average = 1ms	
C: Docu	ments and Settings\lin6>_	-



#### • STA1(10.1.1.4) ping AP1(10.1.1.2)

C:\WI	NDOWS\system32\cmd.exe	×			
thernet	Connection-specific DNS Suffix . : Description	E			
9: Docur Pinging	nents and Settings\lin6>ping 10.1.1.2				
Pinging 10.1.1.2 with 32 bytes of data: Reply from 10.1.1.2: bytes=32 time<1ms TTL=64 Reply from 10.1.1.2: bytes=32 time<1ms TTL=64 Reply from 10.1.1.2: bytes=32 time<1ms TTL=64 Reply from 10.1.1.2: bytes=32 time=1ms TTL=64					
Ping statistics for 10.1.1.2: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = 1ms, Average = Oms					
C: Docur	ments and Settings lin6>	-			



#### • STA2(10.1.1.4) ping AP2(10.1.1.3)

C:\WINDOWS\system32\cmd.exe				
Connection-specific DNS Suffix .: Description Realtek RTL8168/8111 PCI-E Gigabit thernet NIC Physical Address	E			
8: Documents and Settings\lin6>ping 10.1.1.3 Pinging 10 1 1 3 with 32 butes of data:				
Reply from 10.1.1.3: bytes=32 time<1ms TTL=64 Reply from 10.1.1.3: bytes=32 time<1ms TTL=64 Reply from 10.1.1.3: bytes=32 time<1ms TTL=64 Reply from 10.1.1.3: bytes=32 time<1ms TTL=64				
Ping statistics for 10.1.1.3: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms				
C:\Documents and Settings\lin6>	-			



#### • STA2(10.1.1.4) arp table

💽 C:\WI	NDOWS\system32\cmd	.exe	- 🗆 ×			
	Primary Dns Suff Node Type IP Routing Enab WINS Proxy Enab	ix : : Unknown Led : No Led : No				
Ethernet	t adapter 區域連續	泉:				
thernet	Connection-spec: Description NIC Physical Address Dhcp Enabled IP Address Subnet Mask Default Gateway	ific DNS Suffix . : Realtek RTL8168/8111 PCI-E Gig 	abit E			
S: Wocu	ments and setting	js \11n67arp -a				
Interface: 10.1.1.4 0x2						
Inter	net Address	Physical Address Type				
10.1.1	1.1	08-00-27-b4-53-d6 dynamic				
10.1.1	1.2	00-0f-3d-de-1d-d7 dynamic				
10.1.1	1.3	00-0f-3d-de-1d-d0 dynamic				
C: \Docur	ments and Setting	¢s\lin6>	-			



#### • STA2(10.1.1.4) route table

C:\WINDOWS\system	132\cmd.exe			- 🗆 ×			
10.1.1.1	<b>08-00-27-</b> 54-53	-d6 dynamic		<b>_</b>			
10.1.1.2	00-0f-3d-de-1d	l-d7 dynamic					
10.1.1.3	00-0f-3d-de-1d	l-d0 dynamic					
C:\Documents and Settings\lin6>route PRINT							
Interface List							
Øx1	MS TCH	Loopback interf	ace				
0x200 18 f3 5f	43 3a Realte	k RTL8168/8111 P	CI-E Gigabit E	thernet NIC			
- Packet Scheduler	Miniport						
===================				======			
				======			
Active Routes:		0.1	<b>T</b>	Maria			
Network Destinatio	n Netmask	Gateway	Interface	Metric			
10.1.1.0	255.255.255.0	10.1.1.4	10.1.1.4	10			
10.1.1.4	255.255.255.255	127.0.0.1	127.0.0.1	10			
10.255.255.255	255.255.255.255	10.1.1.4	10.1.1.4	10			
127.0.0.0	255.0.0.0	127.0.0.1	127.0.0.1	1			
224.0.0.0	240.0.0.0	10.1.1.4	10.1.1.4	10			
255.255.255.255	255.255.255.255	10.1.1.4	10.1.1.4	1			
Persistent Routes:							
None							
	ottingo\lin(\			_			
G- Wocuments and s							

注意事項(1/4)

- AP1設定檔裡提到//以上為執行第二次以上才有作用,為 device重置的意思,初次執行會無此裝置是沒關係的,因 為不一定執行一次就會成功,故所以加入這一段,執行第 二次以上後就會清除所有設定,重新寫入,也就是重置裝 置的意思
- 基本上,本次實驗都是使用802.11g居多,WiFi(802.11b & 802.11g)有11個無線頻道(channel),由1~11所組成, 他們的頻段為ISM Band 2.4GHz。在同一個地方可能有許 多台AP,由於ll個channel的頻率其實蠻接近的,為了讓 彼此AP降低干擾,而理想的頻道間隔應該為5,也就是在 同一區域如果有3人各自架設自己的AP提供自己人上網使 用,那麼最好的選擇將會是channel 1 & channel 6 & channel 11,此為最理想狀況(頻率間隔越大,彼此間干 擾越低),所以請盡量避免channel在2.4GHz的設備之間架 設AP(ex:微波爐···等等),除非你們是使用WiFi其他的規 格(ex:802.11a就在5GHz···等等)

注意事項(2/4)

- 基於以上第2點,所以如果我們能避開相同或是鄰近的 channel,那麼AP & WDS實驗的成功性必將提高許多,所 以我們可以先使用無線網卡來掃瞄無線AP的channel與 SSID跟一些相關訊息,利用這些訊息來避開實驗選擇相同 或是鄰近的channel,以降低干擾,提升成功率。
- 插入無線網卡,輸入以下指令

#ifconfig ath0 up

#wlanconfig ath0 list scan

我在NETLAB scan,結果如下圖

	ro	ot@wd	s1:~		_ 🗆 🗙
檔案(E)	編輯(E) 顯示(V) 終端機(T)	分頁個	) 求助(H)		
[root@wd	al ~]# ifconfig athO up				<b>▲</b>
[root@wd	sl ~]# wlanconfig athO lis	st scan			
SSID	BSSID	CHAN F	RATE S:N	INT CAPS	
ncue	00:0b:85:7f:67:ff	1	54M 6:0	100 ESs	
ncue	00:0b:85:7f:3f:cf	11	54M 7:0	100 ESs	
Net1ab	00:90:cc:e0:69:34	3	54M 32:0	100 EPs	
[root@wd	s1 ~]#				

注意事項(3/4)

- 我檔案裡有寫echo"",此為print出目前執行到哪一個 指令動作,不一定要寫,只是為了方便debug哪一行出錯。
   另外sleep 3-sleep功能是讓他執行程序後等待一段時間 再度執行下一行指令,避免機器當機狀態,或是沒有執行 指令就跳過。建議寫比較保險,不然當機就飽了(以上是 我試多種Linux Distribution實作adhoc & AP實驗心得), 故我之後都會加 "sleep 3"
- 如果station一端是Windows用户,建議關閉防火牆,不然 無法ping到,先前實驗都是用Linux Distribution,所以 無此問題(此為我這次實作所遇到的問題)
- 此次實驗STA1其實是使用我的NB Win7底下灌Virtualbox 掛載Ubuntu,但是其實不影響結果,我試過了station端 不管是WinXP、Win7、Fedora、CentOS、Ubuntu都可以成 功互ping

注意事項(4/4)

- 先前WDS實驗是在Ubuntu底下架設成功,但是也是一直在 try and error許久之後才革命成功,印象試了N次才成功 1次,已記不得了。經由再次實做WDS實驗,我覺得也許在 Fedora底下會比較容易成功,我執行1~2次就成功了,頂 多3次,已驗證關機重開機再試,驗證10次的成功取樣
- 如果堅持要在Ubuntu底下實作WDS,他的ath0無線網卡mac 開頭會改成06:XX:XX:XX:XX:XX,你要啟動WDS,要加入對 方AP MAC時,也許改成06:XX:XX:XX:XX:XX,才會成功。
- 其實有興趣的同學也可以參考The MadWiFi project網站, 有更多詳細的MadWiFi介紹,可以玩看看加密機制的AP...
   等等,經由實作adhoc & AP & WDS想必同學對網路運作觀 念與原理更加確實了解,Good luck!

參考文獻

#### [1] The MadWifi project

http://madwifi-project.org/wiki