

目的：

現有 甲發射端，乙接收端 兩地遠端架構

新增加 丙接收端，形成 三點互連網路

甲、乙 設備為：

14dBi 指向易天納天線 CPEIII(2.4GHz)×甲 乙 各 1

24dBi 網狀拋物面天線(2.4GHz)×甲 乙 各 1

丙 設備為：

14dBi 指向易天納天線 CPEIII(2.4GHz)× 丙 1

架構為：

甲發射 →→→乙接收 (現役設備)

甲發射 →→→丙接收 (現增設備)

甲發射 →→→乙、丙接收

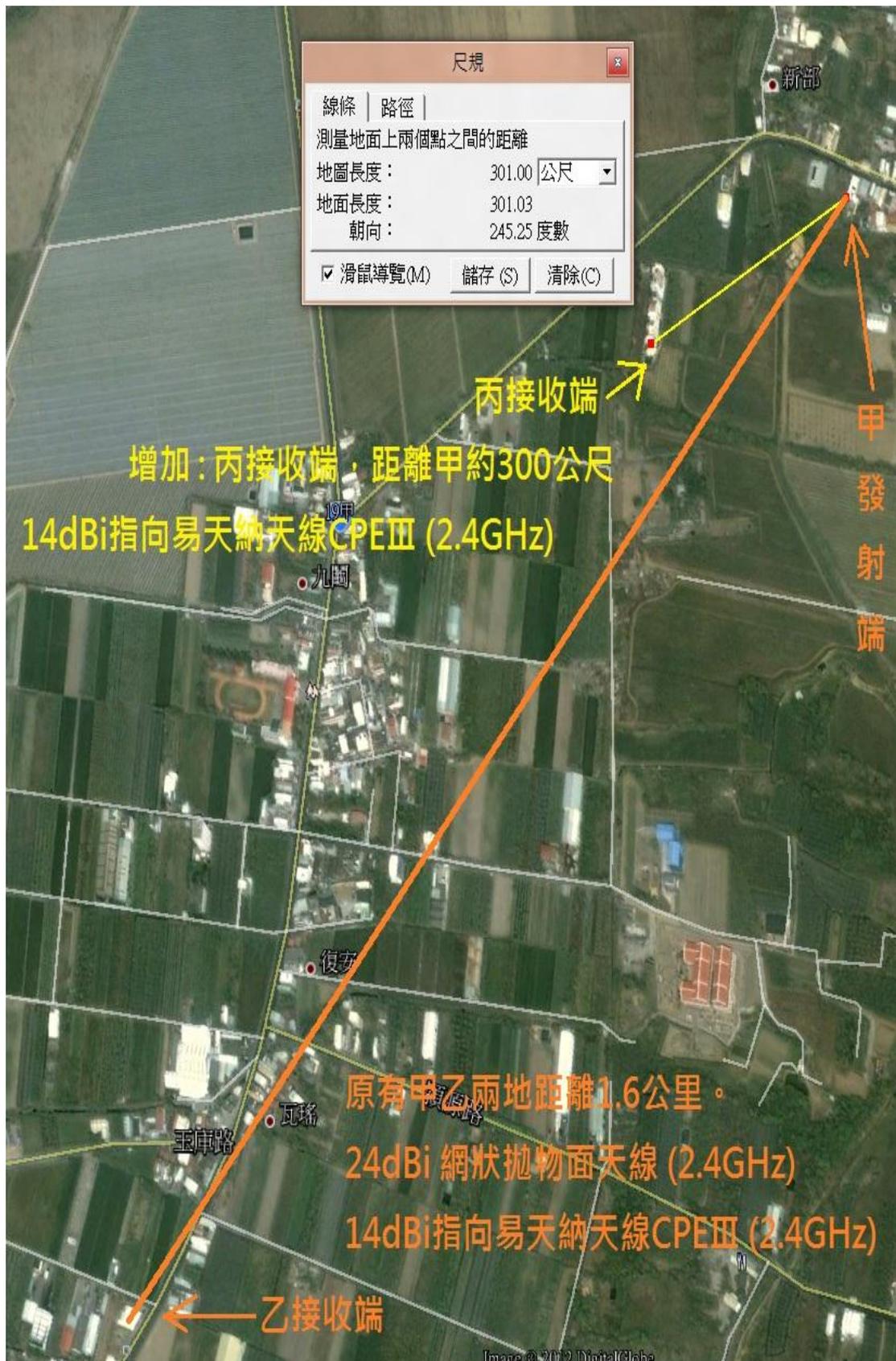
甲 (中華電光纖 50M/10M、監視器、有線電視); 乙、
丙共同分享使用 50M/10M、有線電視 ; 監看甲監視器

距離：

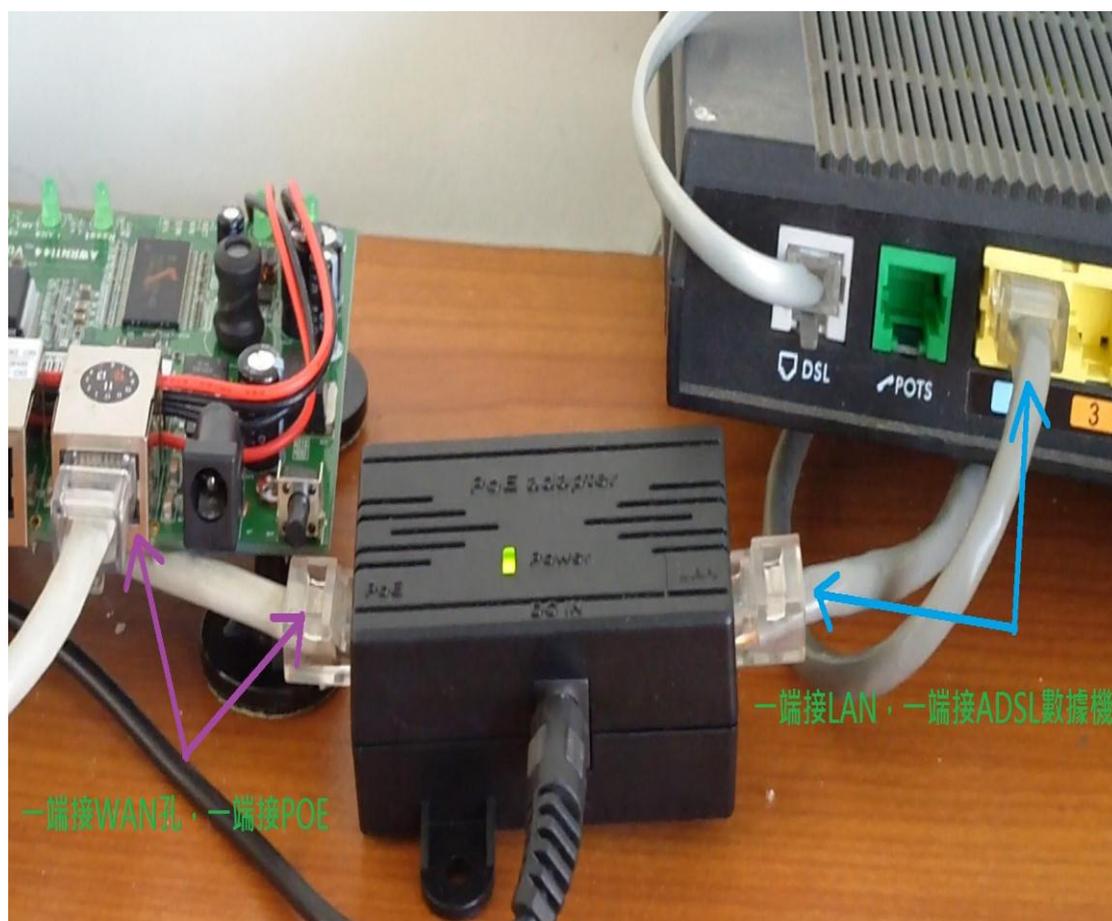
甲→→→1.6 公里→→→乙 (有遮蔽物)

甲→→→300 公尺→→→丙 (無遮蔽物)

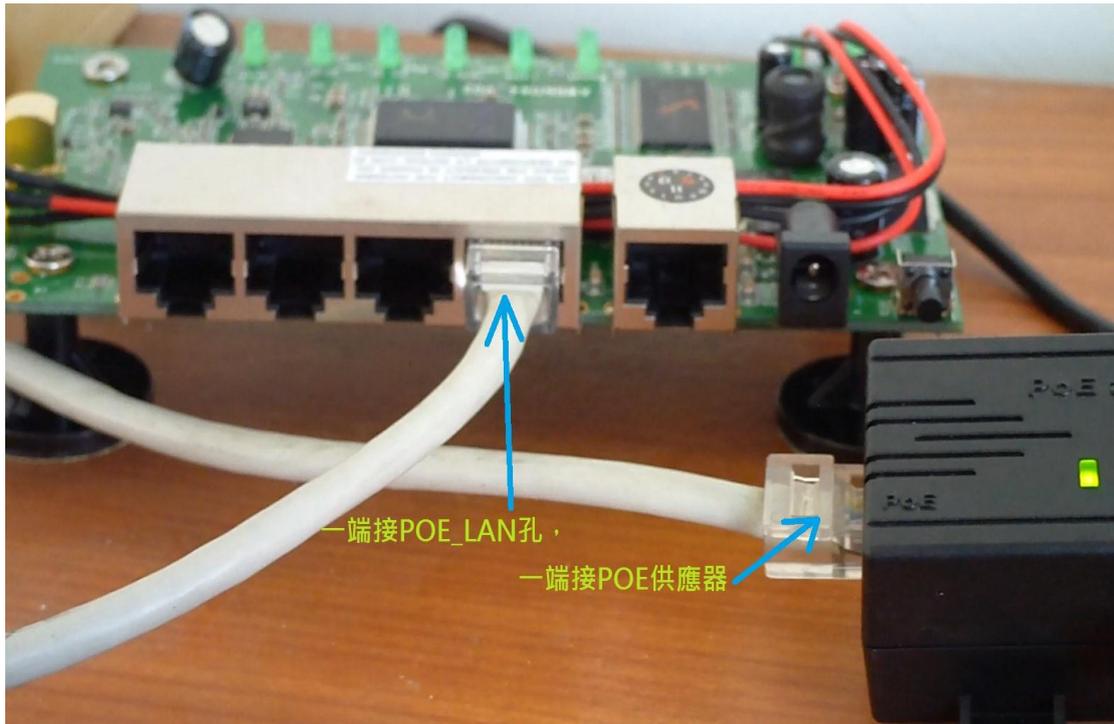
甲乙丙衛星空拍位置圖



甲發射端 接法



乙、丙接收端 接法



丙接收端 14DBI 易天納裝設圖



從 丙接收端 目視 甲發射端



從 甲發射端 目視 丙接收端



設定易天納之前先規劃好 IP 分配

192.168.1.1 (甲發射端易天納 IP)

192.168.1.2 (乙接收端易天納 IP)

192.168.1.3 (丙接收端易天納 IP)

192.168.1.50 ~ 192.168.1.100 (甲發射端 IP 配發範圍)

192.168.1.101 ~ 192.168.1.150 (乙接收端 IP 配發範圍)

192.168.1.151 ~ 192.168.1.200 (丙接收端 IP 配發範圍)

設定易天納之前先寫好，甲乙丙三台的 MAC 位址

甲發射端易天納 MAC 位址 00:e0:4c:a6:3c:9e

乙接收端易天納 MAC 位址 00:e0:4c:a5:ee:7a

丙接收端易天納 MAC 位址 00:e0:4c:a6:36:5c

(輸入格式為 00e04ca6365c 即可，不須加上 :)

設定模式：

甲乙丙皆為 ：AP+WDS

易天納設定如下：

步驟 A : 甲發射端設定

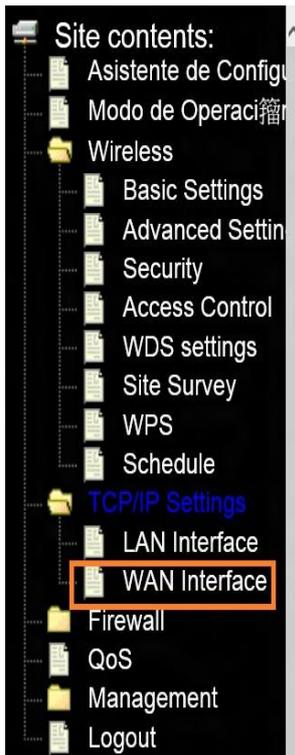
1. 甲發射端 LAN 的設定

The screenshot shows the 'LAN Interface Setup' page in a WLAN Access Point configuration interface. The left sidebar shows a tree view with 'LAN Interface' selected under 'TCP/IP Settings'. The main content area contains the following configuration fields:

- IP Address: 192.168.1.1 (Annotated with '甲發射端IP')
- Subnet Mask: 255.255.255.0
- Default Gateway: 0.0.0.0
- DHCP: Server (Annotated with '設定這個模式')
- DHCP Client Range: 192.168.1.50 - 192.168.1.100 (Annotated with '配發的IP為50~100')
- DHCP Lease Time: 480 (10080 minutes)
- Static DHCP: Set Static DHCP
- Domain Name: (empty)
- 802.1d Spanning Tree: Disabled
- Clone MAC Address: 000000000000

Annotations in orange text and arrows point to the IP address, DHCP mode, and DHCP client range fields.

2. 甲發射端 WAN 的設定



WAN Interface Setup

This page is used to configure the parameters for Internet network which connects to the method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item value of WAN Acco

WAN Access Type: ← 選擇這個模式

User Name: ← 輸入帳號

Password: ← 輸入密碼

Service Name: ← 隨意輸入一名稱

Connection Type:

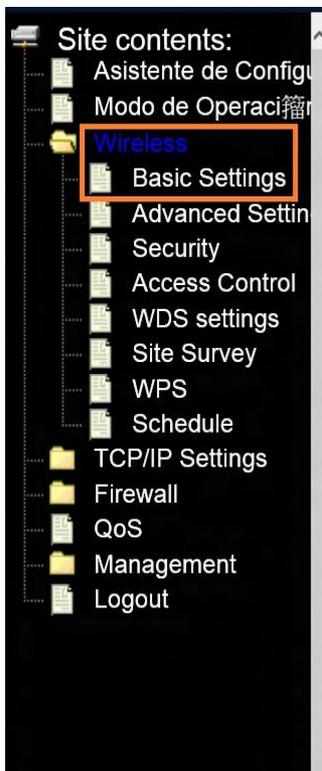
Idle Time: (1-1000 minutes)

MTU Size: (1360-1492 bytes)

Attain DNS Automatically ← DNS選自動取得

Set DNS Manually

3. 甲發射端 BASIC 設定



This page is used to configure the parameters for wireless LAN clients which settings as well as wireless network parameters.

Disable Wireless LAN Interface

Band: ↓

Mode:

Network Type: ↓

SSID: ← 隨意取一名稱 + 建議
甲乙丙都相同

Channel Width: ↓

Control Sideband: ↓

Channel Number: ↓

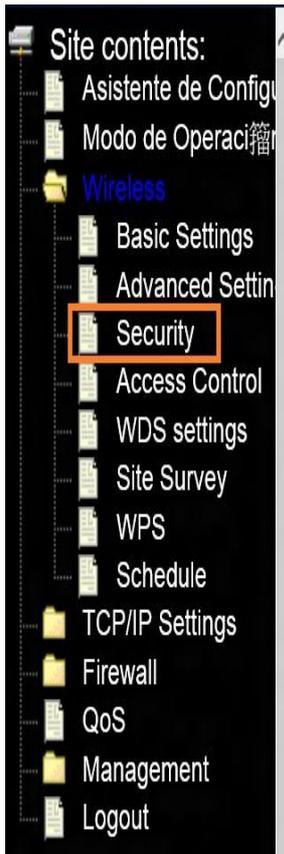
Broadcast SSID: ↓

WMM: ↓

Data Rate: ↓

Associated Clients:

4. 甲發射端 SECURITY 設定



Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption network.

Select SSID:

Encryption:

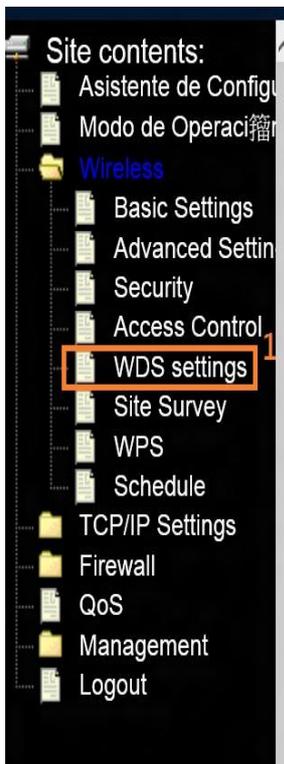
Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

WPA Cipher Suite: TKIP AES

Pre-Shared Key Format:

Pre-Shared Key: ← 甲乙丙三端都設一樣的密碼

5. 甲發射端 WDS 設定



WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the channel and set MAC address of other APs which you want to communicate with in the tab

Enable WDS ²

MAC Address: ← ³ 這裡輸入乙、丙兩端的MAC位址

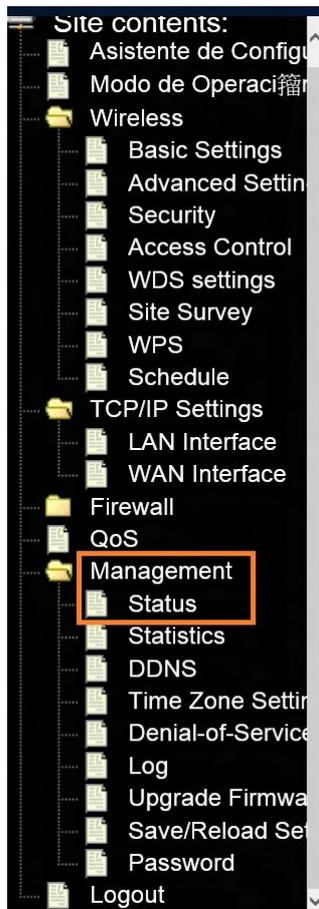
Data Rate:

Comment:

⁴ Current WDS AP List:

MAC Address	Tx Rate (Mbps)	Comment	Select
<input type="text" value="00:e0:4c:a5:ee:7a"/>	← Auto	← 這顯示乙的MAC位址	<input type="checkbox"/>
<input type="text" value="00:e0:4c:a6:36:5c"/>	← Auto	← 這顯示丙的MAC位址	<input type="checkbox"/>

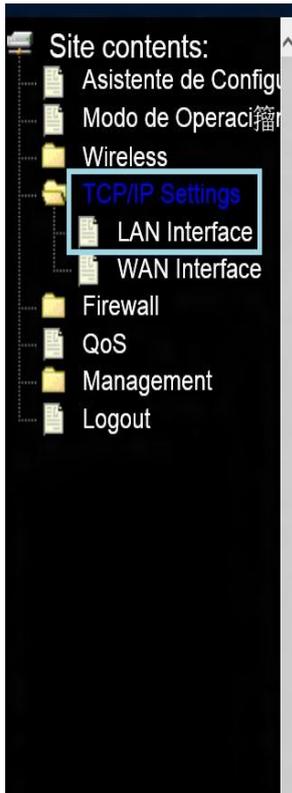
6. 甲發射端設定完成後的資料檢視



System	
Uptime	7day:9h:34m:44s
Firmware Version	v2.5
Build Time	Tue Apr 24 18:57:15 CST 2012
Wireless Configuration	
Mode	AP+WDS
Band	2.4 GHz (B+G+N)
SSID	HiNET_5010
Channel Number	11
Encryption	WPA(AP), Disabled(WDS)
BSSID	00:e0:4c:a6:3c:9e
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.1.1 ← 自己的IP
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
DHCP Server	Enabled
MAC Address	00:e0:4c:a6:3c:9e ← 自己的MAC位址
WAN Configuration	
Attain IP Protocol	PPPoE Connected
IP Address	114.40.161.179 ← 光纖成功連上線的資料
Subnet Mask	255.255.255.255 ← 如果沒有連線成功，
Default Gateway	168.95.98.254 ← 這些欄位會顯示空白。
MAC Address	00:e0:4c:a6:3c:a3

步驟 B : 乙接收端設定

1. 乙接收端 LAN 的設定



LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the Internet for IP address, subnet mask, DHCP, etc..

IP Address: ← 乙接收端 IP

Subnet Mask:

Default Gateway: ← 輸入甲發射端IP

DHCP: ← 設定這個模式

DHCP Client Range: -

DHCP Lease Time: (1 ~ 10080 minutes) ↑

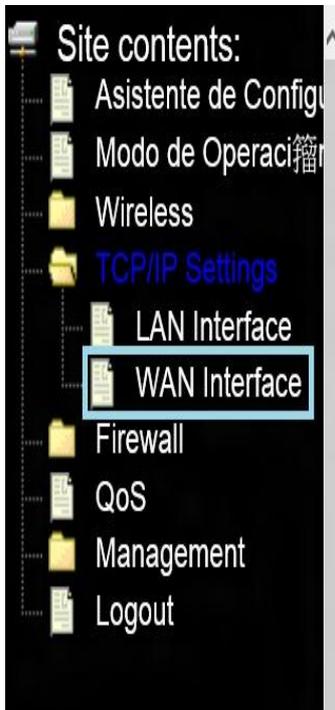
Static DHCP: ← 配發的IP範圍為 101~150

Domain Name:

802.1d Spanning Tree:

Clone MAC Address:

2. 乙接收端 WAN 的設定



WAN Interface Setup

This page is used to configure the parameters for Internet network method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item.

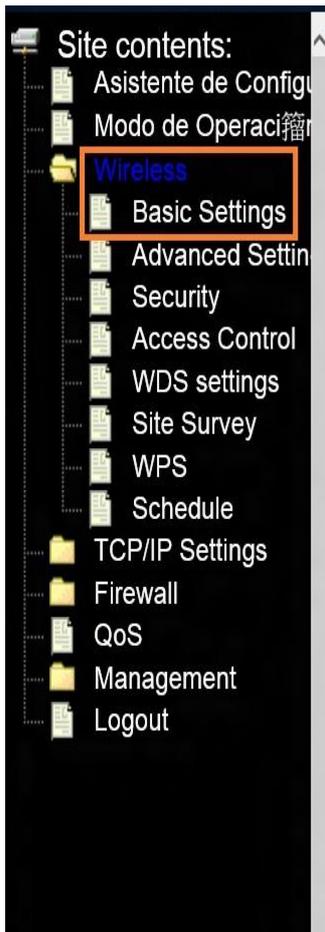
WAN Access Type:

Host Name:

MTU Size: (1400-1492 bytes)

Attain DNS Automatically ← DNS自動取得

3. 乙接收端 BASIC 設定



This page is used to configure the parameters for wireless LAN clients which settings as well as wireless network parameters.

Disable Wireless LAN Interface

Band: 2.4 GHz (B+G+N) ▼

Mode: AP+WDS ▼ Multiple AP

Network Type: Infrastructure ▼

SSID: HiNET_5010 ← 隨意取一名稱，建議
甲乙丙都相同

Channel Width: 40MHz ▼

Control Sideband: Upper ▼

Channel Number: 11 ▼

Broadcast SSID: Enabled ▼

WMM: Enabled ▼

Data Rate: Auto ▼

Associated Clients: Show Active Clients

4. 乙接收端 SECURITY 設定



Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption network.

Select SSID: Root AP - HiNET_5010 ▼ Apply Changes Reset

Encryption: WPA ▼

Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

WPA Cipher Suite: TKIP AES

Pre-Shared Key Format: Passphrase ▼

Pre-Shared Key: ●●●●●● ← 甲乙丙三端都
設一樣的密碼

5. 乙接收端 WDS 設定

The screenshot shows the WDS Settings page in a network management interface. On the left, a sidebar lists various configuration options, with 'WDS settings' highlighted and numbered '1'. The main content area is titled 'WDS Settings' and includes a description: 'Wireless Distribution System uses wireless media to communicate with other APs, like channel and set MAC address of other APs which you want to communicate with in the'. Below this, there are several configuration fields: 'Enable WDS' (checked, numbered '2'), 'MAC Address' (input field, numbered '3' with a note '這裡輸入甲發射端MAC位址'), 'Data Rate' (set to 'Auto'), and 'Comment' (empty). At the bottom, there are buttons for 'Apply Changes' (numbered '4'), 'Reset', 'Set Security', and 'Show Statistics'. Below the buttons is a table titled 'Current WDS AP List' with columns for 'MAC Address', 'Tx Rate (Mbps)', 'Comment', and 'Select'. The first row shows '00:e0:4c:a6:3c:9e' (numbered '4' with a note '這裡顯示甲的MAC位址') and 'Auto'.

Site contents:

- Asistente de Configuración
- Modo de Operación
- Wireless
 - Basic Settings
 - Advanced Settings
 - Security
 - Access Control
 - WDS settings
 - Site Survey
 - WPS
 - Schedule
- TCP/IP Settings
 - LAN Interface
 - WAN Interface
- Firewall
- QoS
- Management

WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like channel and set MAC address of other APs which you want to communicate with in the

Enable WDS

MAC Address:

Data Rate: Auto

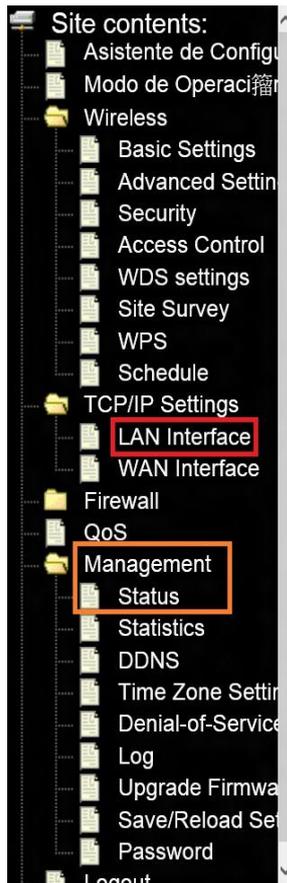
Comment:

Apply Changes Reset Set Security Show Statistics

Current WDS AP List:

MAC Address	Tx Rate (Mbps)	Comment	Select
00:e0:4c:a6:3c:9e	Auto		<input type="checkbox"/>

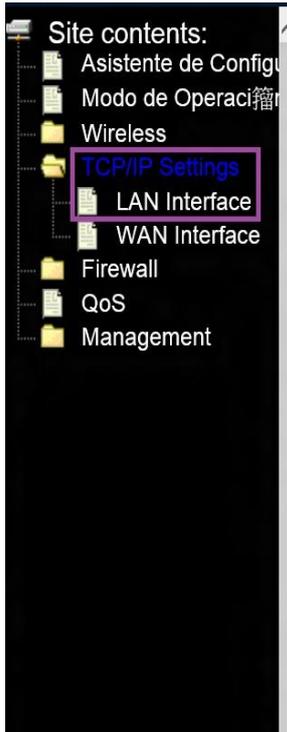
6. 乙接收端設定完成後的資料檢視



System	
Uptime	15day:8h:18m:38s
Firmware Version	v2.5
Build Time	Tue Apr 24 18:57:15 CST 2012
Wireless Configuration	
Mode	AP+WDS
Band	2.4 GHz (B+G+N)
SSID	HiNET_5010
Channel Number	11
Encryption	WPA(AP), Disabled(WDS)
BSSID	00:e0:4c:a5:ee:7a
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.1.2 ← 自己的IP
Subnet Mask	255.255.255.0 這裡顯示Gateway為自己的IP，因為
Default Gateway	192.168.1.2 ← LAN Interface已經設好甲發射端
DHCP Server	Enabled 192.168.1.1為Gateway。
MAC Address	00:e0:4c:a5:ee:7a ← 自己的MAC位址
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0 沒有連外的資料，因
Subnet Mask	0.0.0.0 ← 為是透過甲發射端光
Default Gateway	0.0.0.0 纖連結
MAC Address	00:e0:4c:a5:ee:7f

步驟 C : 丙接收端設定

1. 丙接收端 LAN 的設定



LAN Interface Setup

This page is used to configure the parameters for local area network which connects to the Internet for IP address, subnet mask, DHCP, etc..

IP Address: ← 丙接收端IP

Subnet Mask:

Default Gateway: ← 輸入甲發射端IP

DHCP: ← 設定這個模式

DHCP Client Range: -

DHCP Lease Time: (1 ~ 10080 minutes)

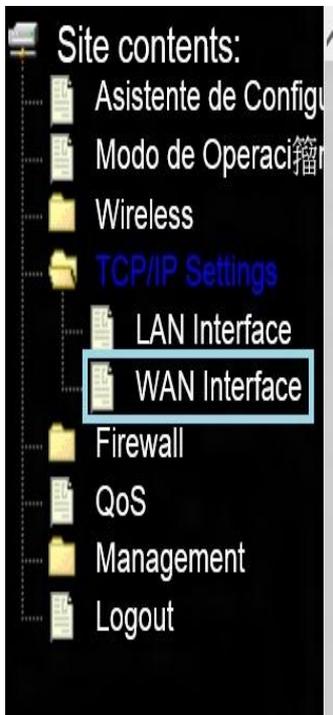
Static DHCP:

Domain Name: ← 配發IP的範圍為：151~200

802.1d Spanning Tree:

Clone MAC Address:

2. 丙接收端 WAN 的設定



WAN Interface Setup

This page is used to configure the parameters for Internet network connection method to static IP, DHCP, PPPoE, PPTP or L2TP by click the item

WAN Access Type:

Host Name:

MTU Size: (1400-1492 bytes)

Attain DNS Automatically ← DNS自動取得

3. 丙接收端 BASIC 設定



This page is used to configure the parameters for wireless LAN clients which settings as well as wireless network parameters.

Disable Wireless LAN Interface

Band: 2.4 GHz (B+G+N) ▼

Mode: AP+WDS ▼ Multiple AP

Network Type: Infrastructure ▼

SSID: HiNET_5010 ← 隨意取一名稱，建議
甲乙丙都相同

Channel Width: 40MHz ▼

Control Sideband: Upper ▼

Channel Number: 11 ▼

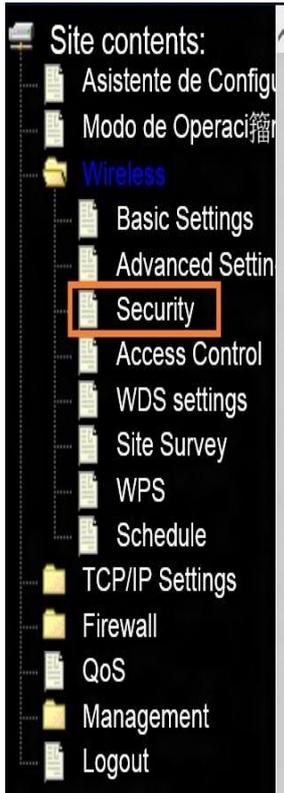
Broadcast SSID: Enabled ▼

WMM: Enabled ▼

Data Rate: Auto ▼

Associated Clients: Show Active Clients

4. 丙接收端 SECURITY 設定



Wireless Security Setup

This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption network.

Select SSID:

Encryption:

Authentication Mode: Enterprise (RADIUS) Personal (Pre-Shared Key)

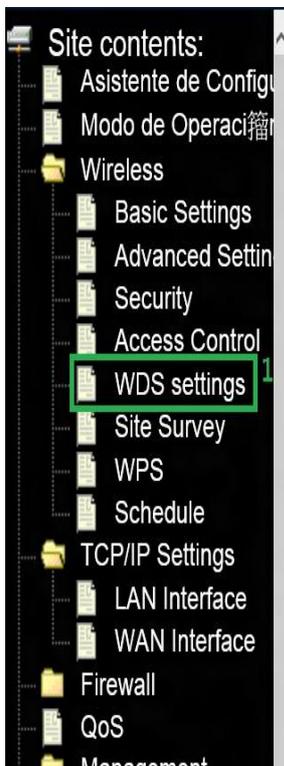
WPA Cipher Suite: TKIP AES

Pre-Shared Key Format:

Pre-Shared Key:

甲乙丙三端都
設一樣的密碼

5. 丙接收端 WDS 設定



WDS Settings

Wireless Distribution System uses wireless media to communicate with other APs, like the Ethernet channel and set MAC address of other APs which you want to communicate with in the table

Enable WDS

MAC Address:

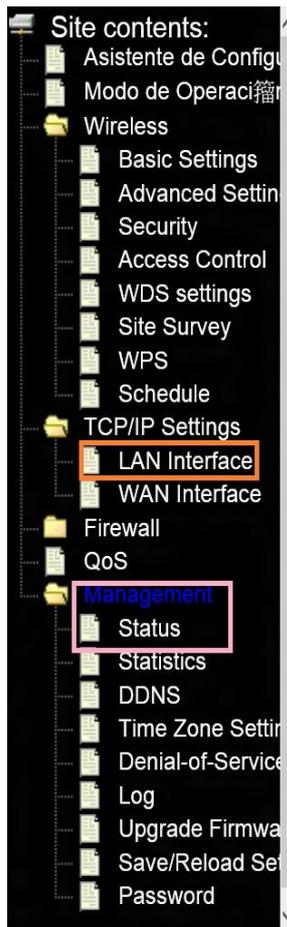
Data Rate:

Comment:

Current WDS AP List:

MAC Address	Tx Rate (Mbps)	Comment	Select
00:e0:4c:a6:3c:9e	Auto	這顯示甲的MAC位址	<input type="checkbox"/>

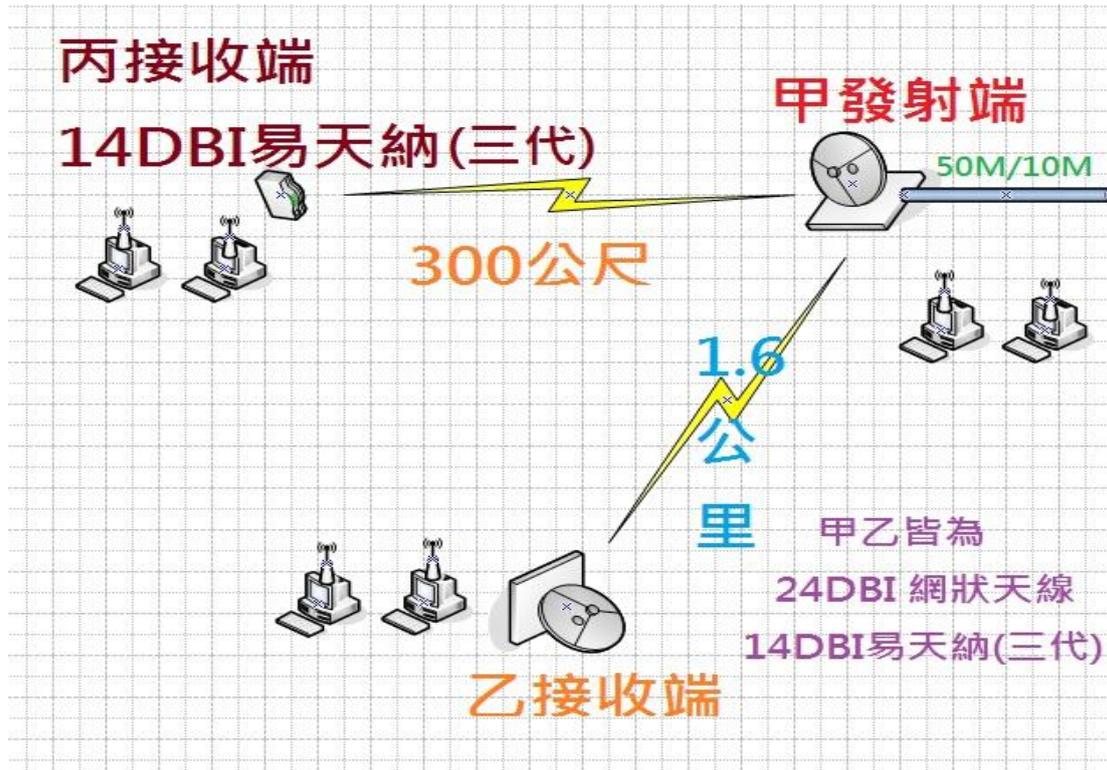
6. 丙接收端設定完成後的資料檢視



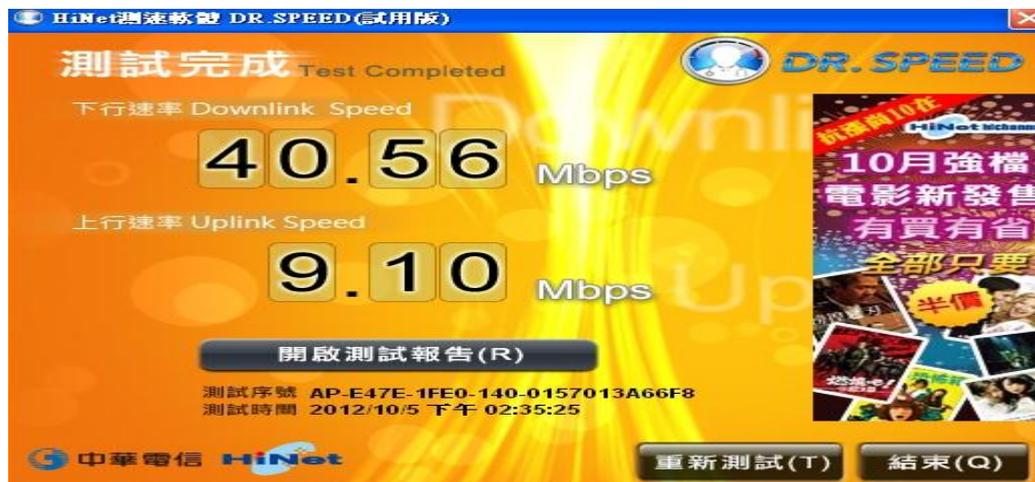
System	
Uptime	0day:0h:28m:33s
Firmware Version	v2.5
Build Time	Tue Apr 24 18:57:15 CST 2012
Wireless Configuration	
Mode	AP+WDS
Band	2.4 GHz (B+G+N)
SSID	HiNET_5010
Channel Number	11
Encryption	WPA(AP), Disabled(WDS)
BSSID	00:e0:4c:a6:36:5c
Associated Clients	0
TCP/IP Configuration	
Attain IP Protocol	Fixed IP
IP Address	192.168.1.3 ← 自己的IP
Subnet Mask	255.255.255.0 這裡顯示Gateway為自己的IP，因
Default Gateway	192.168.1.3 ← 為LAN Interface已經設好甲發射端
DHCP Server	Enabled 192.168.1.1為Gateway。
MAC Address	00:e0:4c:a6:36:5c ← 自己的MAC位址
WAN Configuration	
Attain IP Protocol	Getting IP from DHCP server...
IP Address	0.0.0.0 沒有連外的資料，因為
Subnet Mask	0.0.0.0 ← 是透過甲發射端光纖連
Default Gateway	0.0.0.0 結
MAC Address	00:e0:4c:a6:36:61

以上資料都設定完成後，即完成兩岸三地統一大業

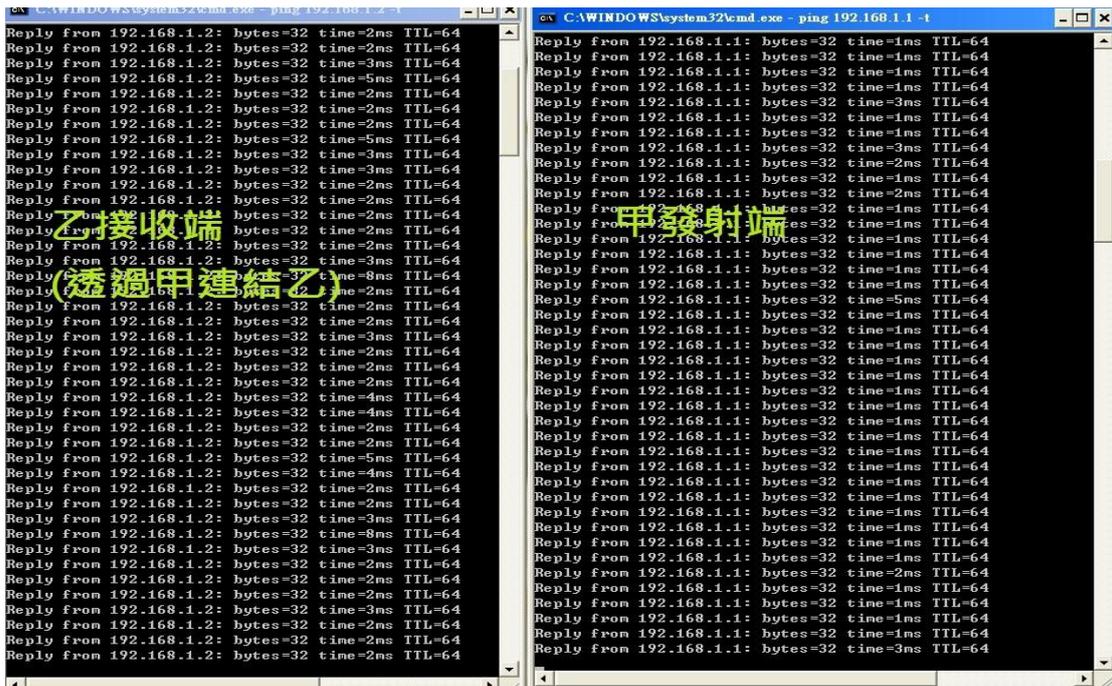
甲乙丙架構圖



首先丙接收端測試連線數據。



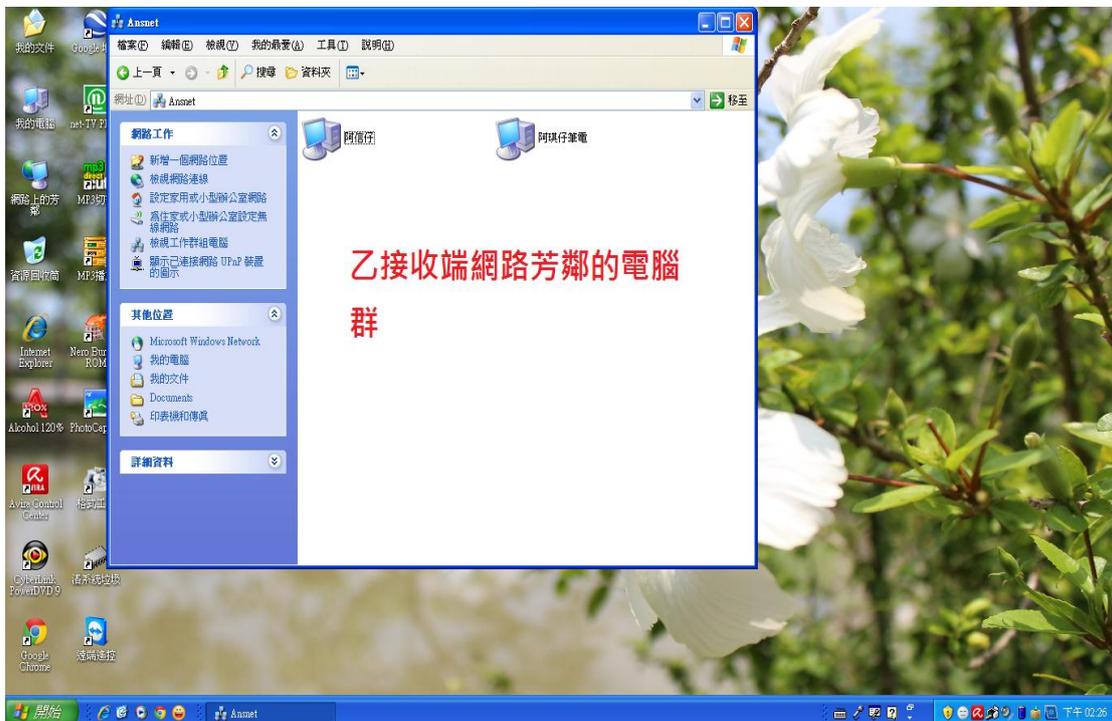
從丙端 PING 甲乙兩端



從網路上的芳鄰可以兩岸三地互相連結資料

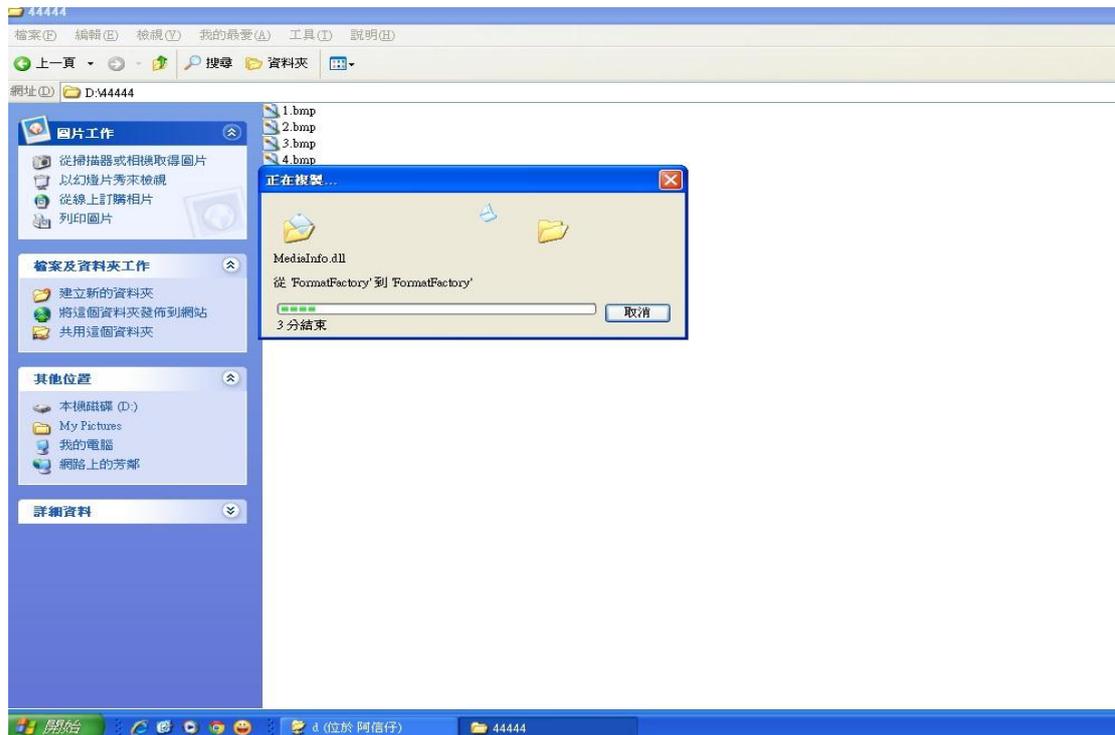
從 丙接收端 透過 甲發射端 連結 乙接收端

乙 ↔ 甲 ↔ 丙



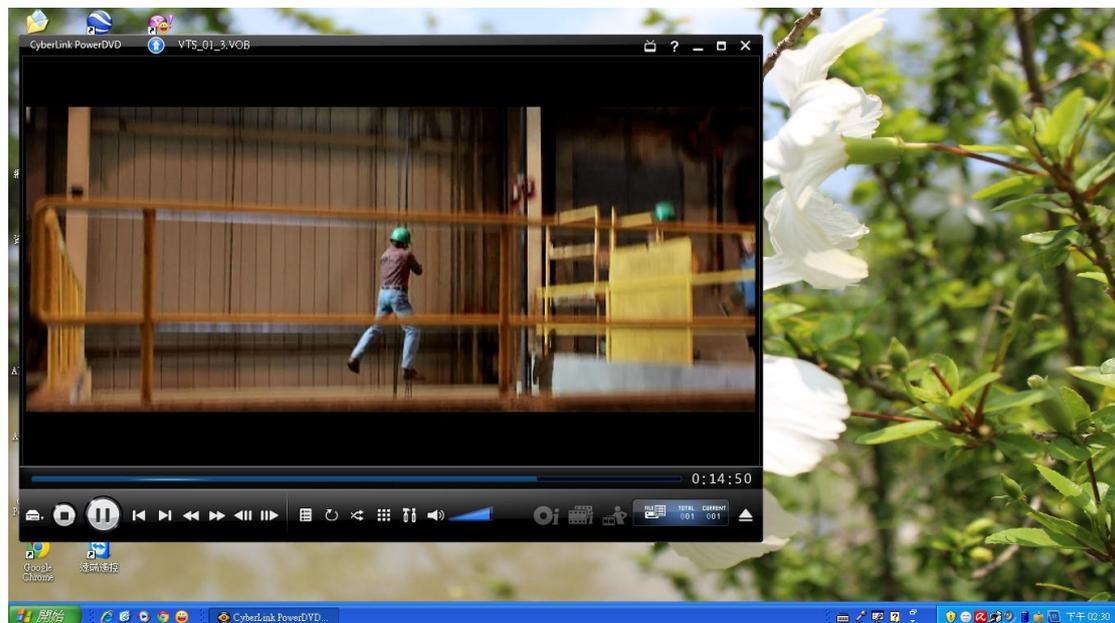
從 丙接收端 透過 甲發射端 連結 乙接收端

複製 187M 的資料 約 3 分鐘



從 丙接收端 透過 甲發射端 連結 乙接收端

收看儲存在網路硬碟的 DVD 影片 (不會累格, 很順)



甲乙丙的連線數據比較



從 丙接收端 連結 甲發射端 收看有線電視 (很順)



從 丙接收端 連結 甲發射端 監看監視器 (很順)

