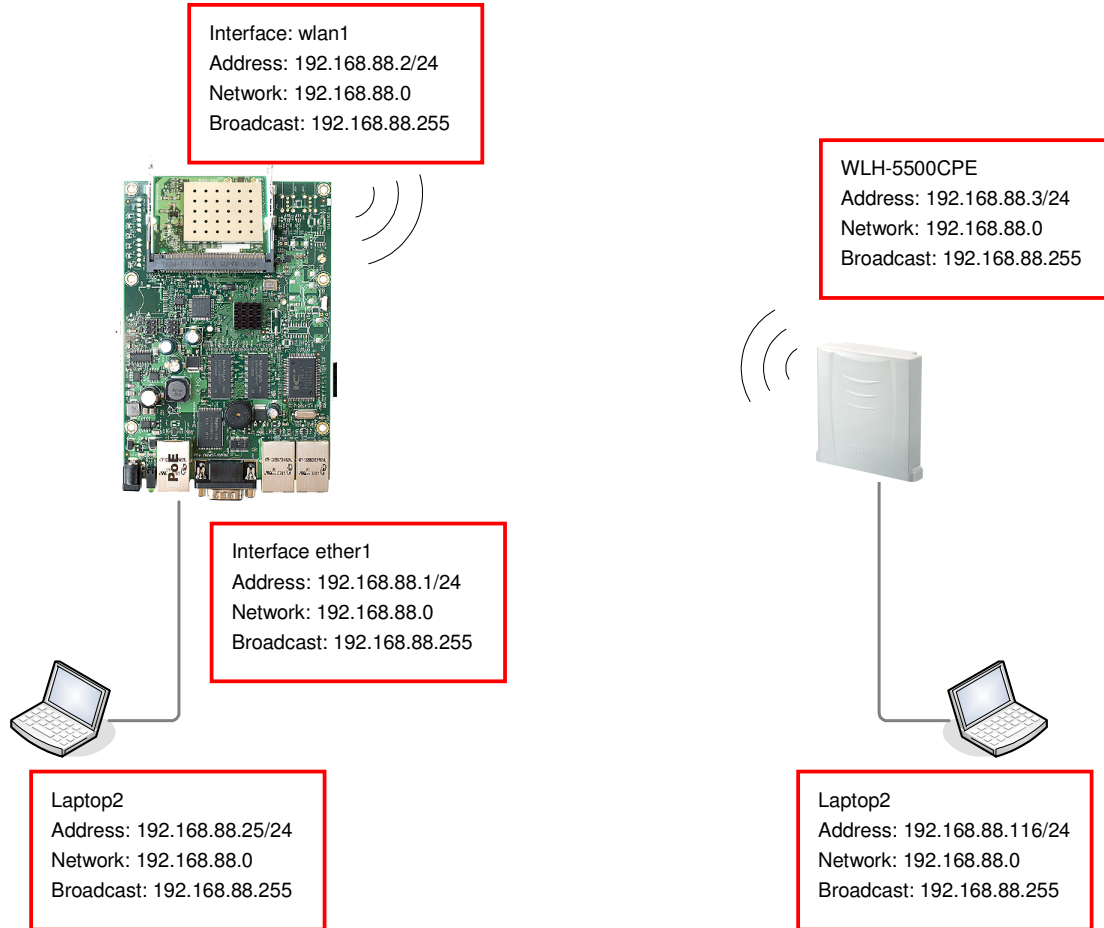


WH-5500CPE/WHA-5500CPE-NT and Mikrotik Router Board Connection Guide

This document guides you to connect WHA-5500CPE/WHA-5500CPE-NT and Mikrotik RB-433 with wireless interface. When Mikrotik is set to be AP Bridge mode, WHA-5500CPE/WHA-5500CPE-NT can connect to it by using client infrastructure mode and WDS Bridge pure MAC mode.

Topology:



Devices:

Mikrotik RB-433 Router Board with one Atheros AR5414A mini-PCI with RouterOS installed.
WHA-5500CPE firmware version **1.00e20** or later, /WHA-5500CPE-NT firmware version **1.00e13** or later. Laptop * 2

Software:

Winbox configuration tool ([download](#))

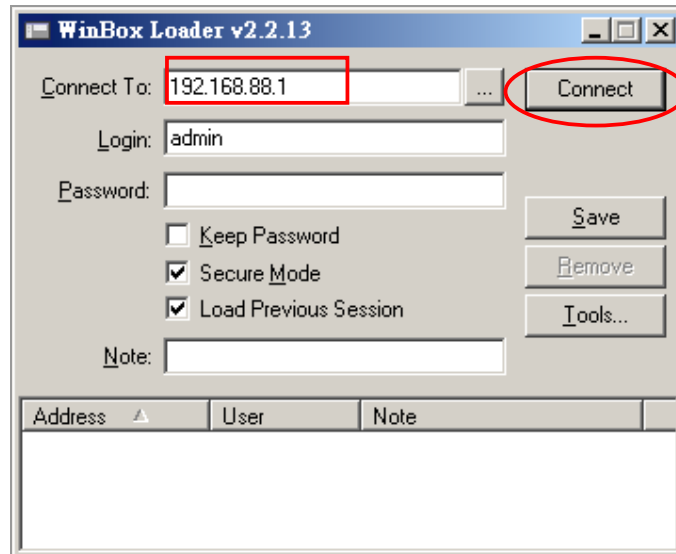
In this document, we use winbox for Mikrotik configuration only.

Note: Please change the IP address of WHA-5500CPE/WHA-5500CPE-NT and Laptops before process. In this document, we use IP address as above topology. Default IP address of Mikrotik ether1 is 192.168.88.1.

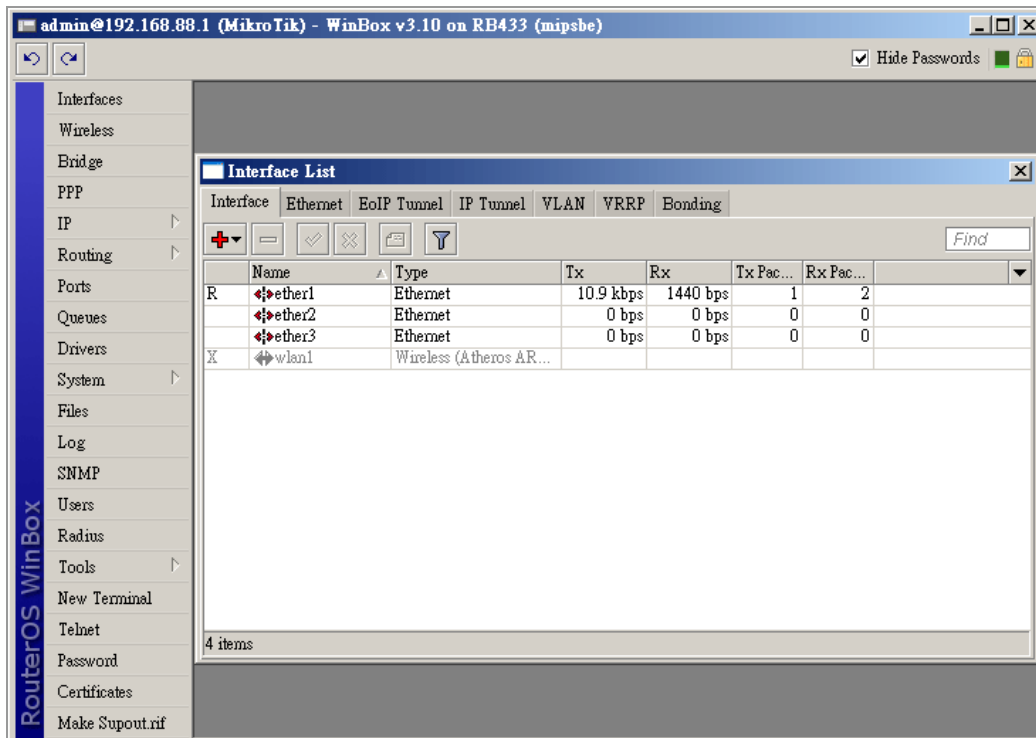
Connection 1: Mikrotik in **AP Bridge** mode, **WHA-5500CPE/WHA-5500CPE-NT** in client infrastructure mode

1.1 Miktotik ap bridge configuration:

Step1. Launch winbox software, enter 192.168.88.1 in “Connect To” field and click “Connect” button.

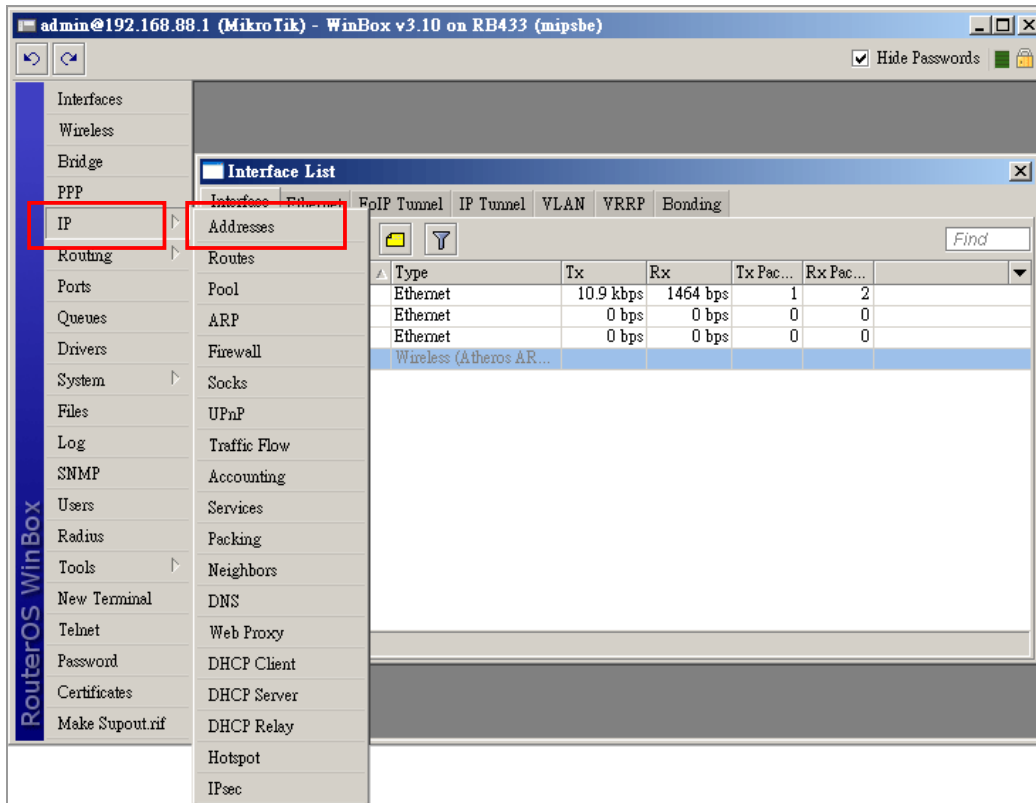


The management interface shows up as following.

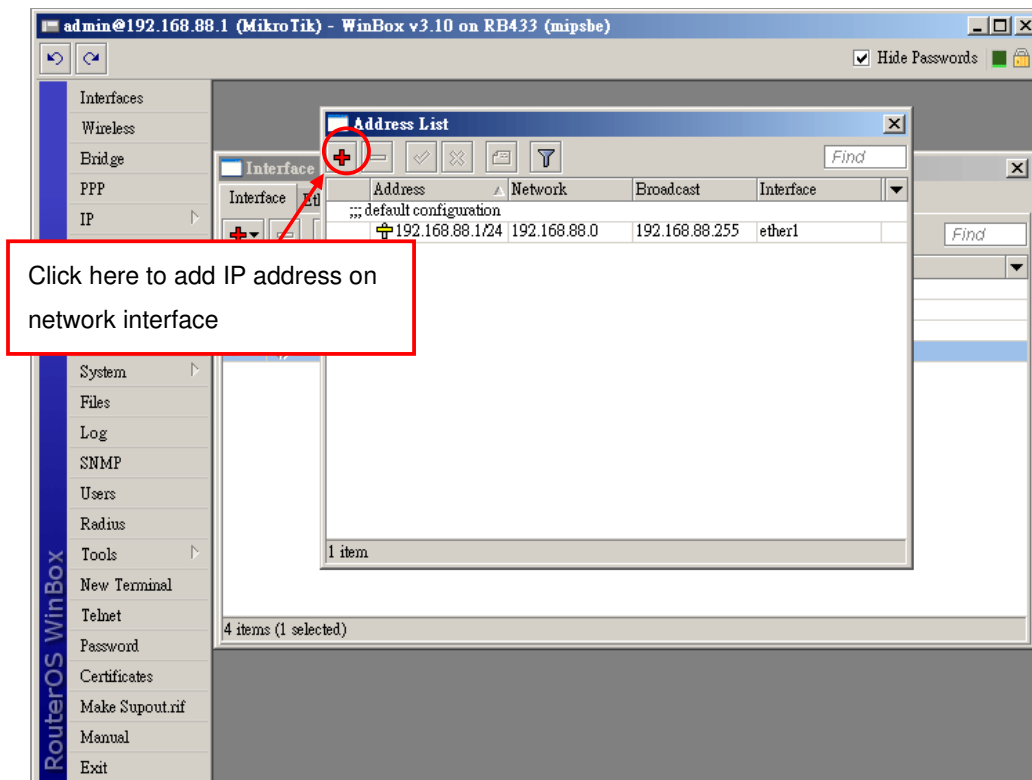


Step2. Add IP address to wireless interface (wlan1)

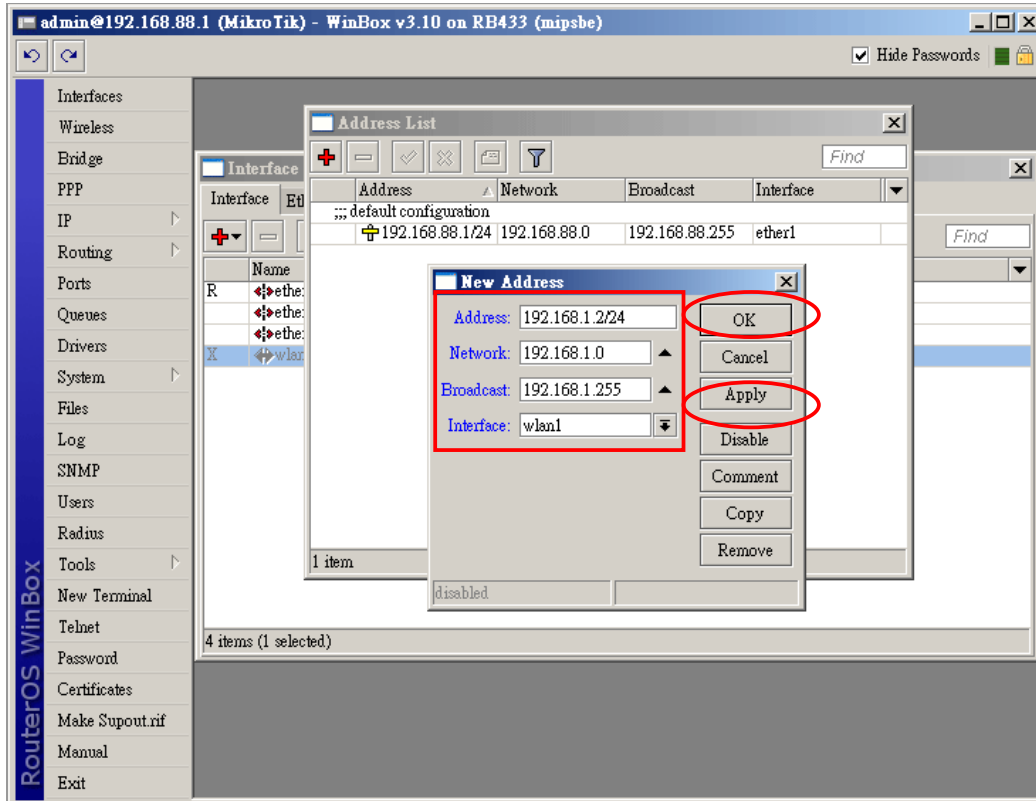
Click IP → Address



It then Address List menu, click “+” to add IP address on network interface.



When “New Address” dialog box shows, fill the IP address information to **wlan1**.



In our example, wlan1's IP address is set to be:

Address: 192.168.1.2/24

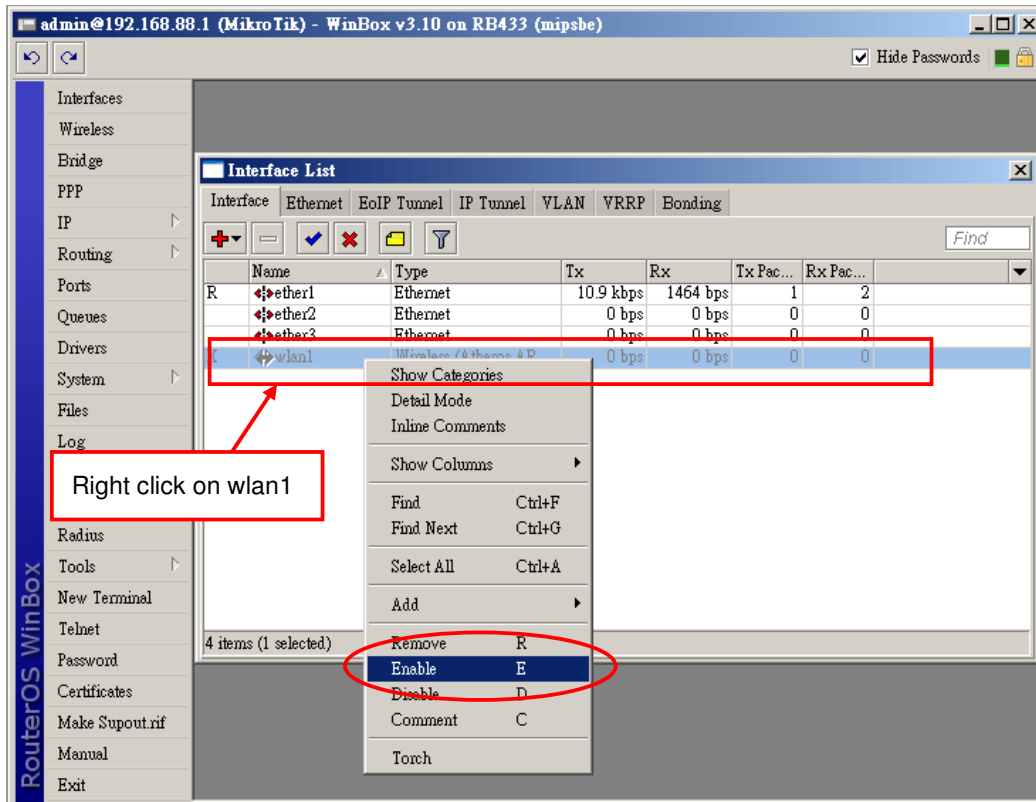
Network: 192.168.1.0

Broadcast: 192.168.1.255

Interface: **wlan1**

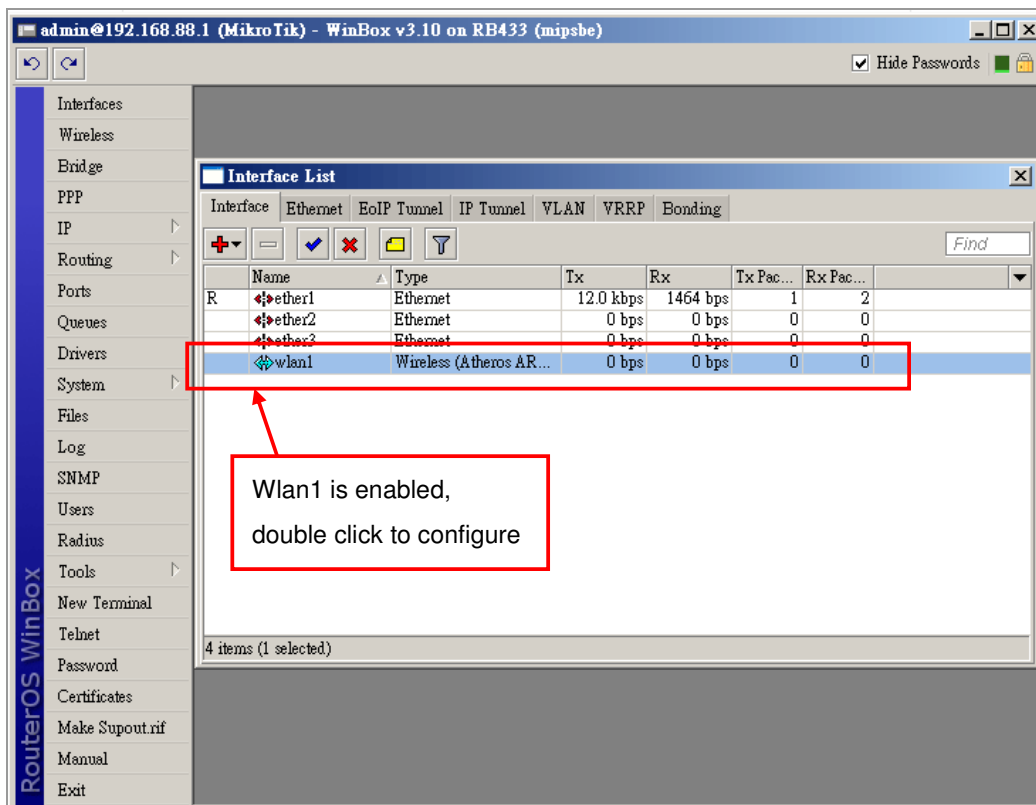
Click Apply and OK button to save.

Right click on wlan1 interface and click “Enable” button to enable.

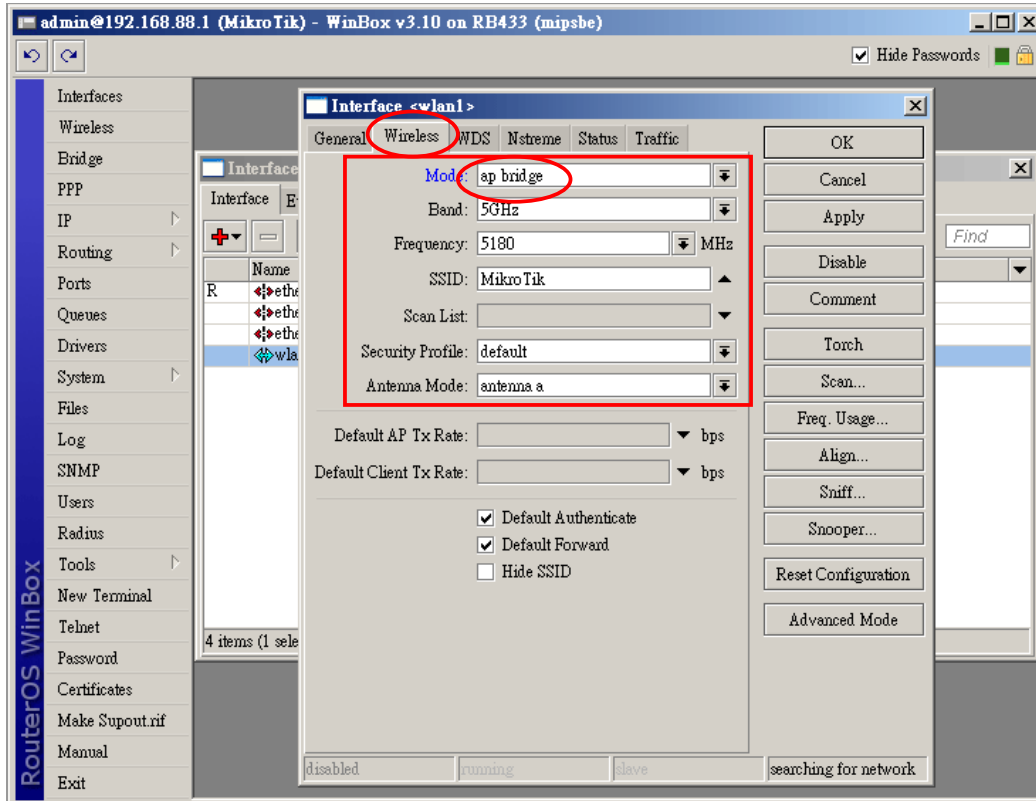


Step3. Configure wlan1 to AP Bridge mode

Double click on wlan1 to configure.



Select “ap bridge” mode and change parameters



In our sample, we use these parameters:

Mode: ap bridge

Band: 5GHz

Frequency: 5180MHz (Channel 36)

SSID: MikroTik

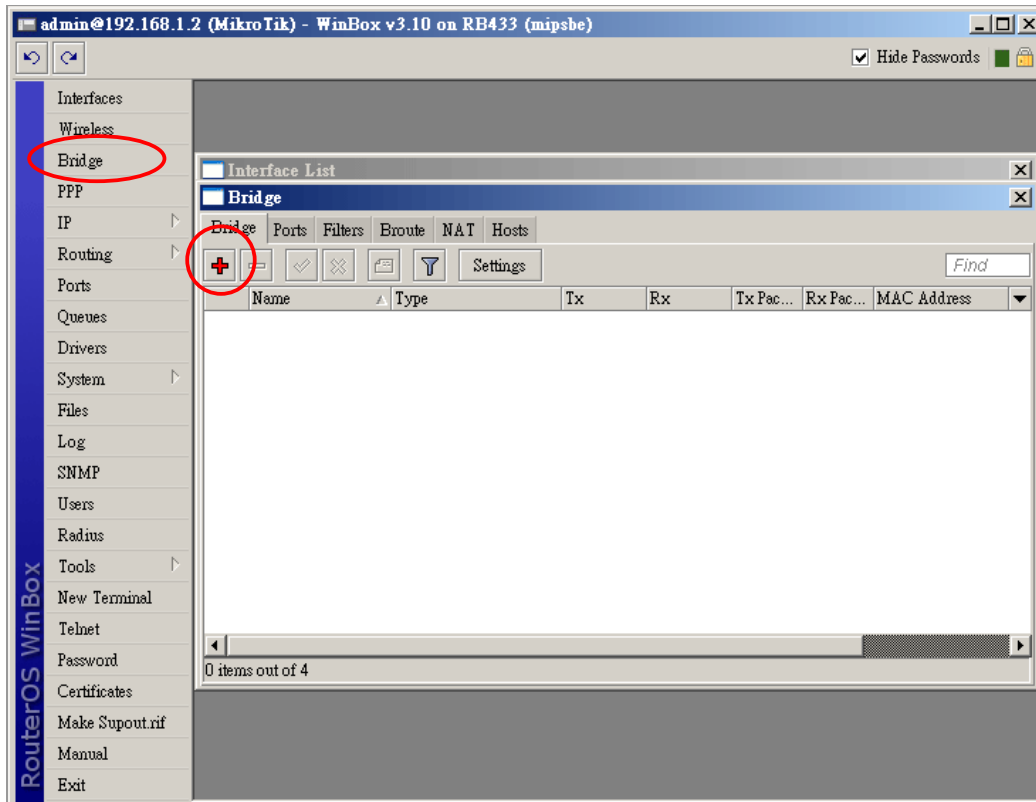
Security: default (none)

Antenna Mode: antenna a (main output of mini-PCI)

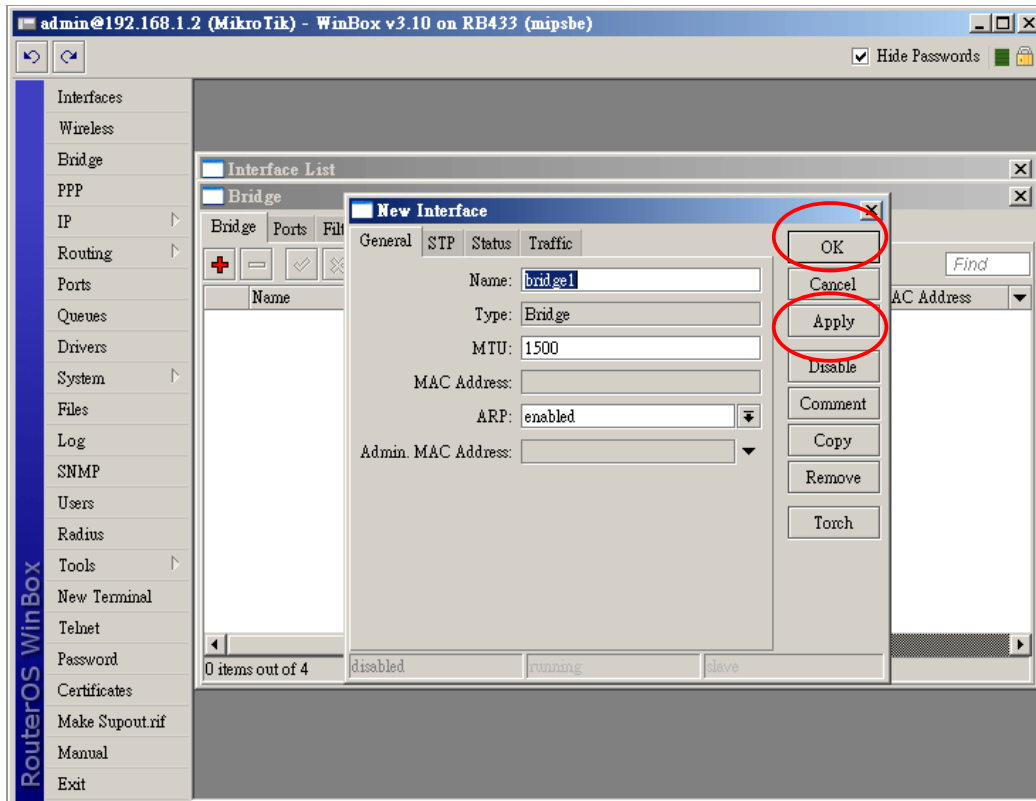
Step4. Bridge wlan1 and ether1

All interfaces can not communicate to each other by default, so that wlan1 and ether1 can not send data to each other. It needs to add bridge to these two interfaces.

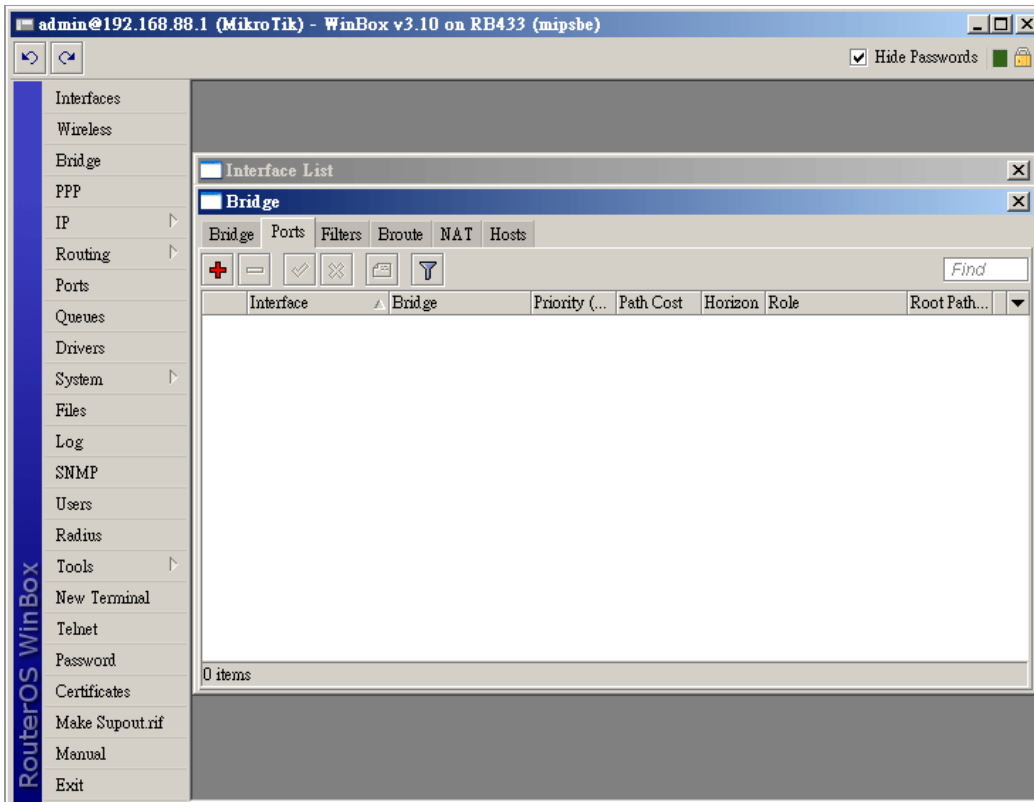
Click “Bridge” menu and “+” button.



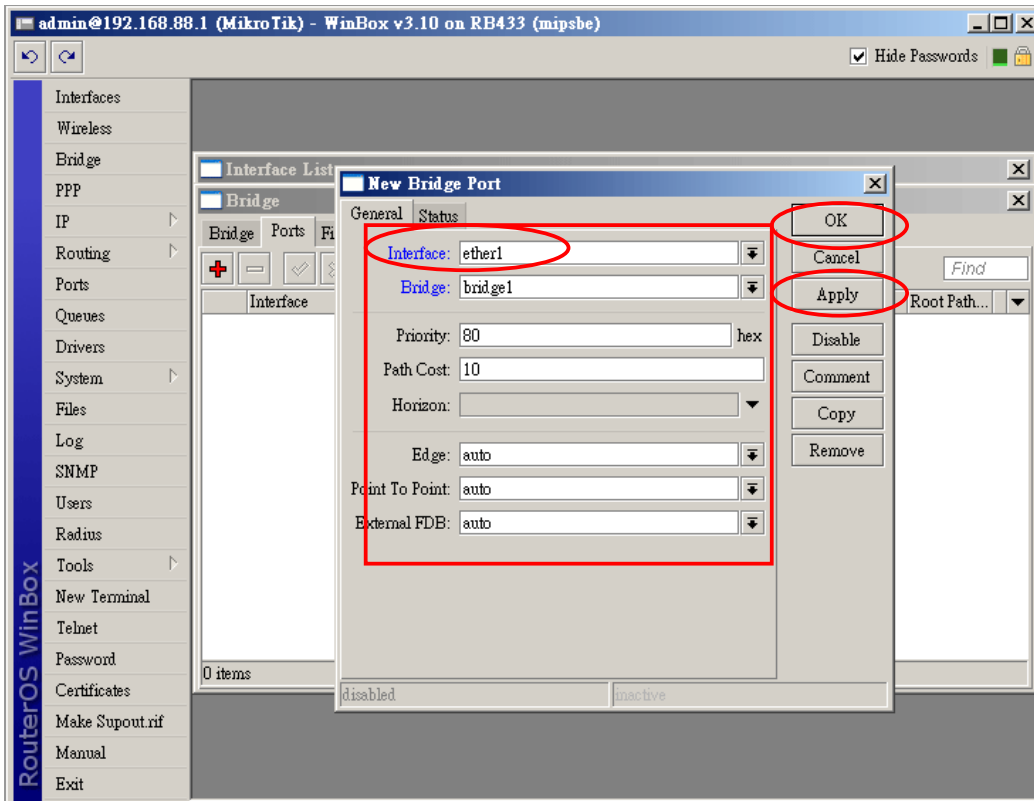
It shows “New Interface” dialog box. Click “Apply” and “OK” to save. In our example, we did not change parameters here.

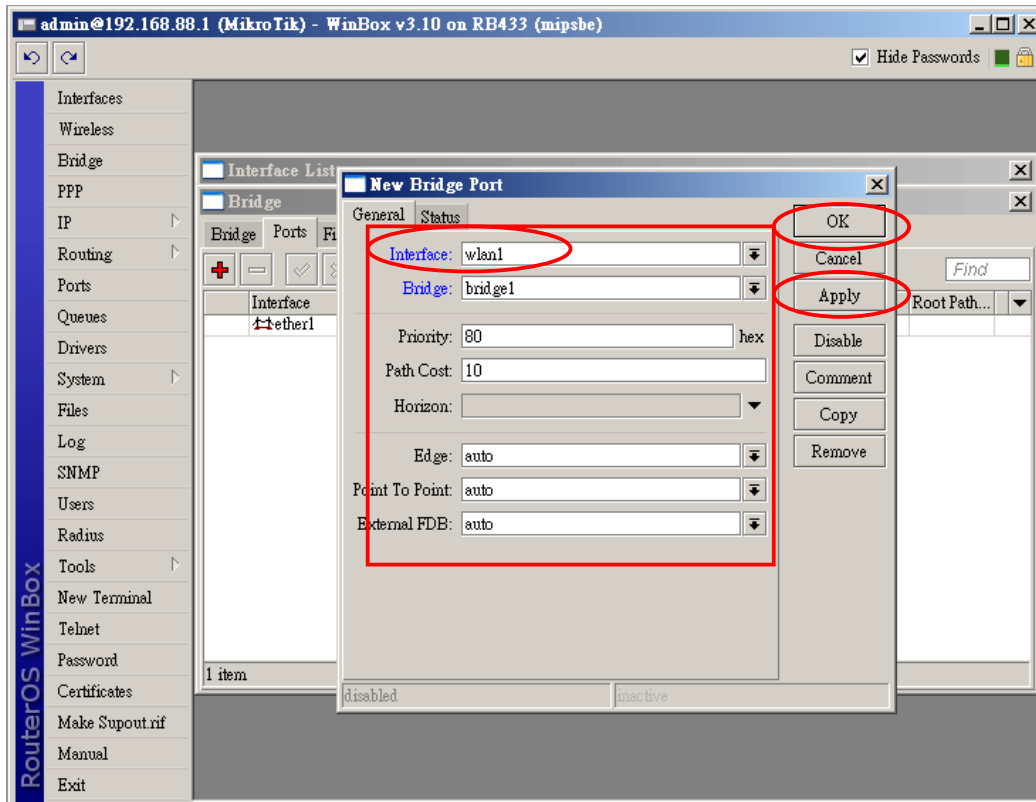


Add wlan1 and ether1 to Ports. Click “Ports” and “+”



It then shows the “New Bridge Port” dialog box, select and set parameters then click “Apply” and “OK” button to save.

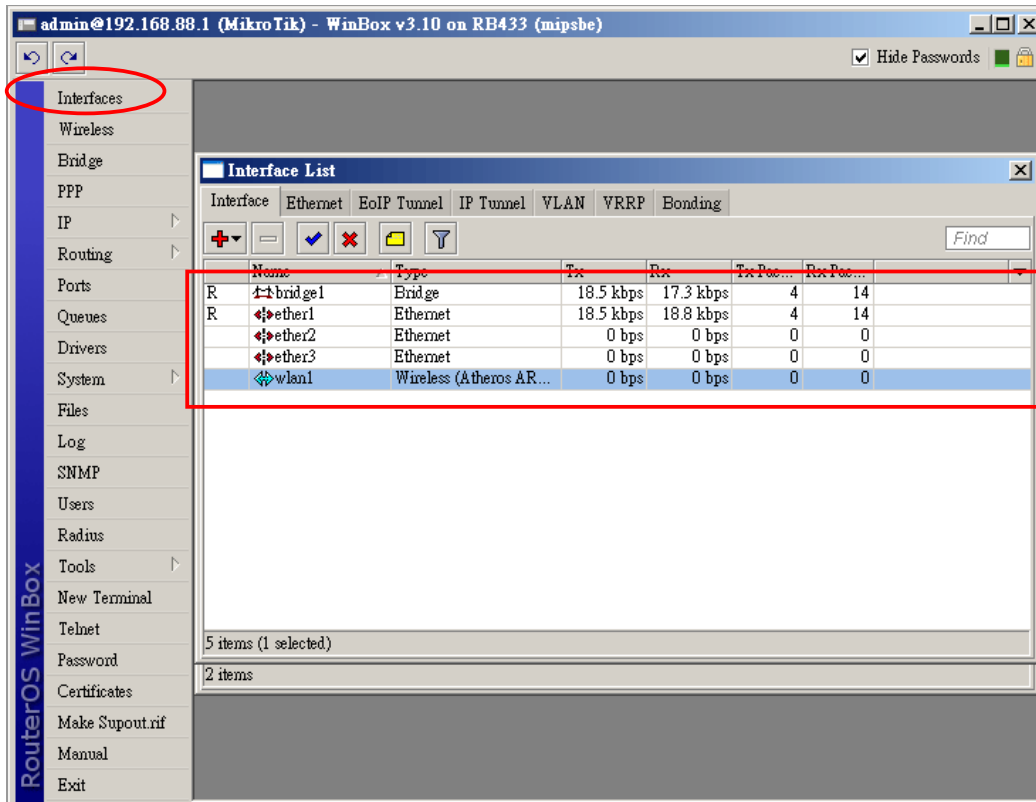




In our example, we add ether1 and wlan1 to Bridge.

Note: Please add ether1 first.

Step5. Back to Interface and confirm interfaces are enabled. In our example, bridge1, ethernet1 and wlan1 must be enabled.



1.2 WHA-5500CPE/WHA-5500CPE-NT connect to Mikrotik using client infrastructure mode

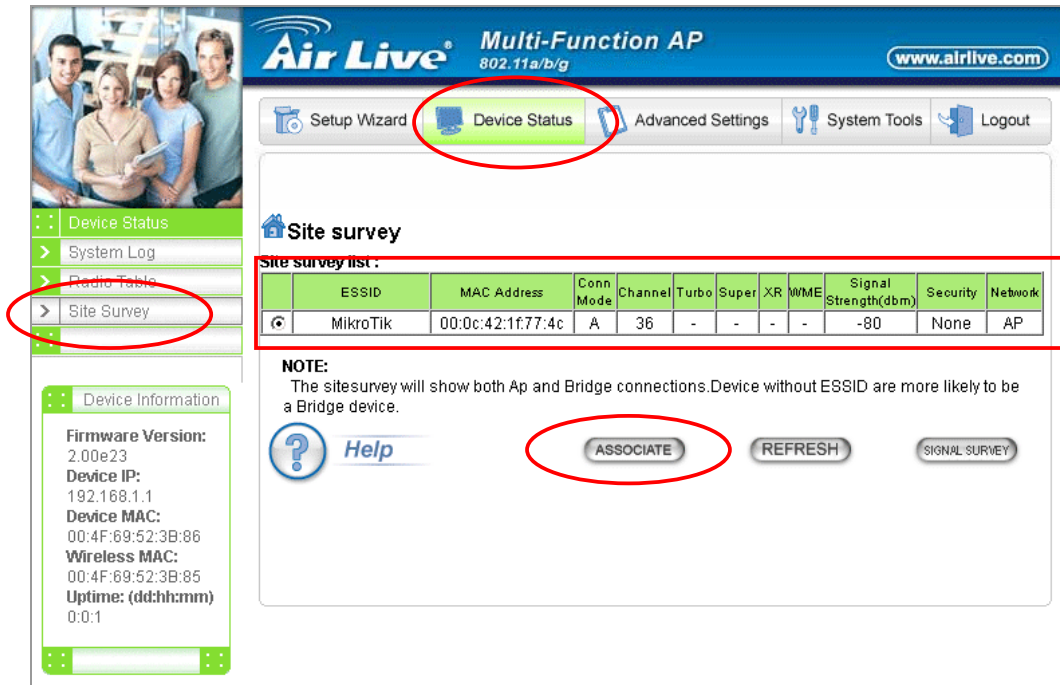
Step1. Change operation mode to client infrastructure

In "Advanced Settings" → "Operational Mode" select "Client Infrastructure" and click "Apply" button to save. WHA-5500CPE/WHA-5500CPE-NT then reboot to client infrastructure mode.



Step2. Site survey and connect to Mikrotik.

Click "Device Status" → "Site Survey", you will see Mikrotik's SSID, click "ASSOCIATE" button to connect.



Laptop2 ping to Laptop1:

```
C:\WINDOWS\system32\cmd.exe - ping 192.168.88.25 -t
Microsoft Windows XP
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Ryan>ping 192.168.88.25 -t

Pinging 192.168.88.25 with 32 bytes of data:

Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=2ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
```

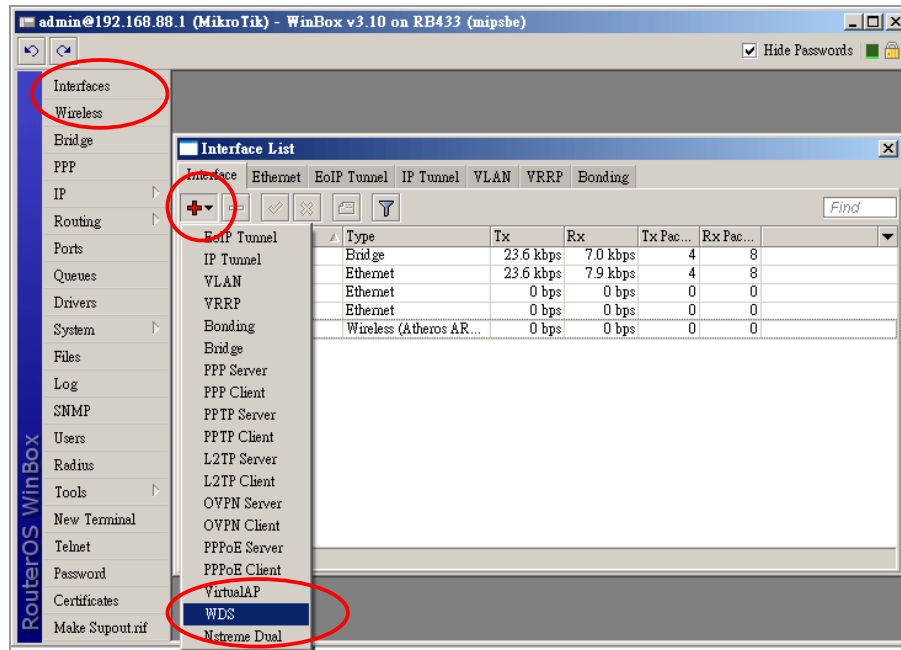
Connection 2: Mikrotik in **AP Bridge** mode, **WHA-5500CPE/WHA-5500CPE-NT** in WDS Bridge pure MAC mode

This connection follows connection 1, Mikrotik add WDS interface in wlan1.

WHA-5500CPE/WHA-5500CPE-NT changes to WDS Bridge pure MAC mode.

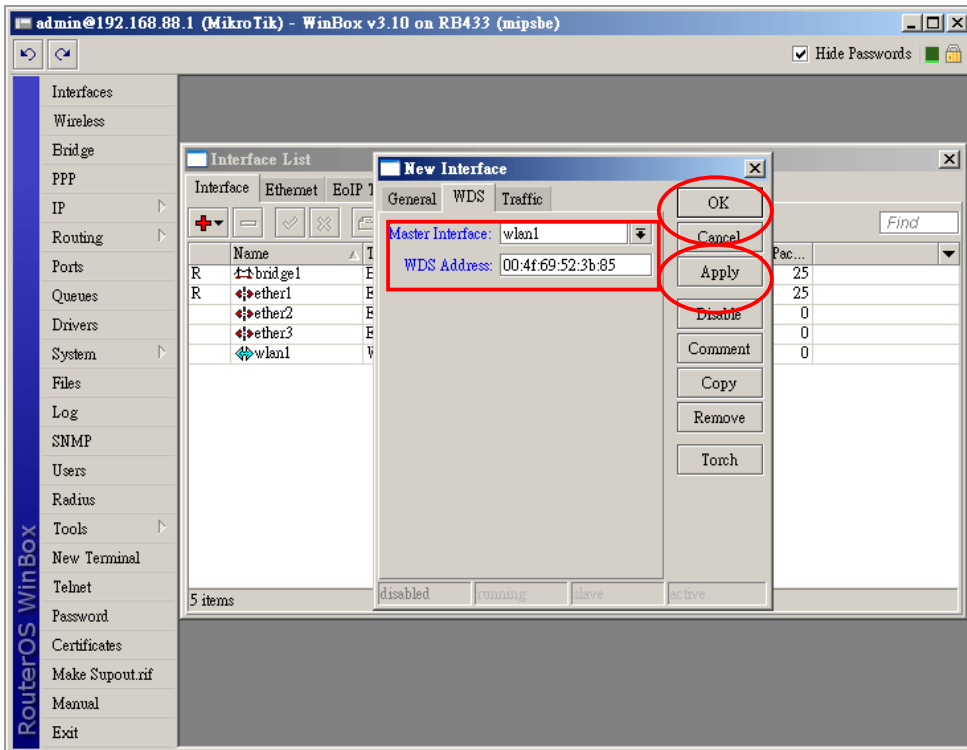
2.1 Mikrotik add WDS in wlan1

Step1. Add WDS interface for wlan1. Click Interface → “+” and select “WDS”

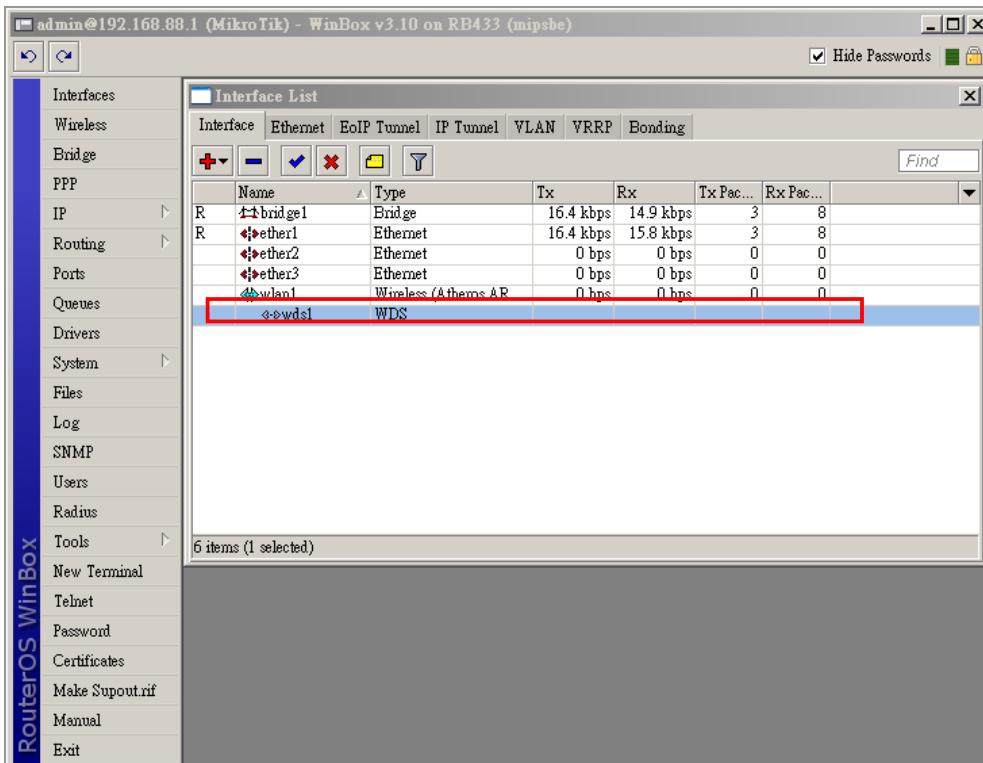


Enter the WHA-5500CPE/WHA-5500CPE-NT's MAC address in the “WDS Address” field.

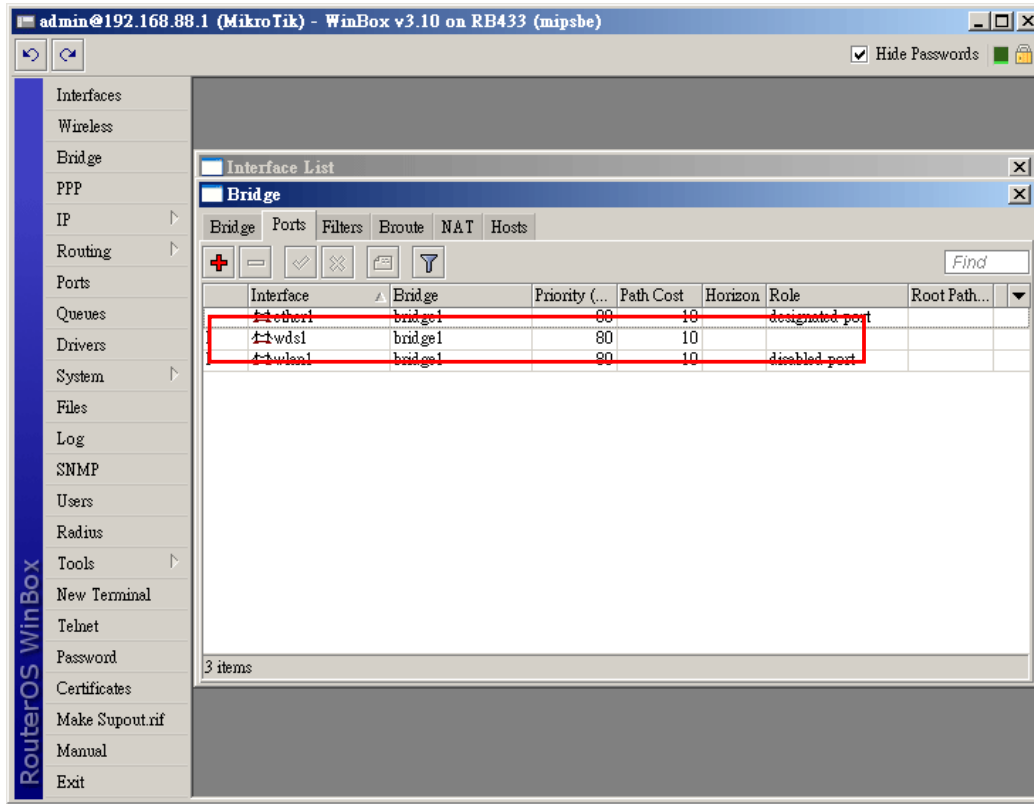
Click “Apply” and “OK” button to save.



The interface then shows WDS for wlan1, as following:

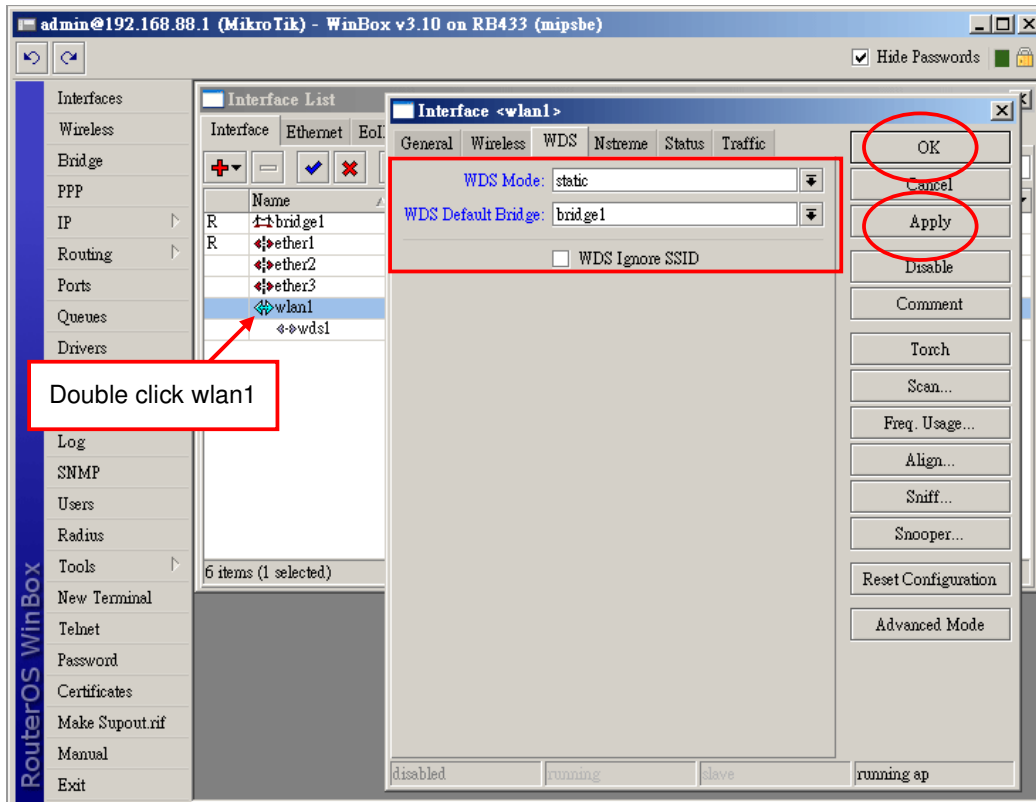


Step3. Add WDS to Bridge Ports



Step3. Enable WDS in wlan1

Double click wlan1, and change parameters in “**Interface <wlan1>**” dialog. Click “Apply” and “OK” button to save.



In our example, we select “WDS Mode” to “static” and “WDS Default Bridge” to “bridge1”. Some Access Point can not send SSID in WDS mode. Please enable “WDS Ignore SSID” in this situation.

In our example, we use the original SSID “MikroTik”.

2.2 WHA-5500CPE/WHA-5500CPE-NT WDS configuration

Login to WHA-5500CPE/WHA-5500CPE-NT. In “Advanced Settings” → “Operation Mode”, select “WDS Bridge” filled parameters and click “ADD” button to add.

In our example, we use these parameters:

WDS Bridge Mode: Pure MAC Mode

Name: Mikrotik_Router

SSID: Mikrotik

MAC address: 00-0c-42-1f-98-5d

Security Policy: None

Operational Mode

Select the operational mode

- Access Point
- Repeater
- WDS Bridge
- Client Infrastructure
- Client Adhoc
- WISP Router
- AP Router

Additional configurations for WDS bridge mode:

Infrastructure Mode Pure MAC Mode

Name:

SSID:

MAC address: - - - - -

Select Security Policy:

Select	Name	SSID	MAC Address	Security
-	-	-	-	-

[Help](#)

When configured successfully, the added WDS shows in the list.

Select	Name	SSID	MAC Address	Security
<input type="radio"/>	Mikrotik_Router	MikroTik	00-0c-42-1f-98-5d	None

Laptop2 ping Laptop1

```
C:\WINDOWS\system32\cmd.exe - ping 192.168.88.25 -t
Microsoft Windows XP
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Ryan>ping 192.168.88.25 -t

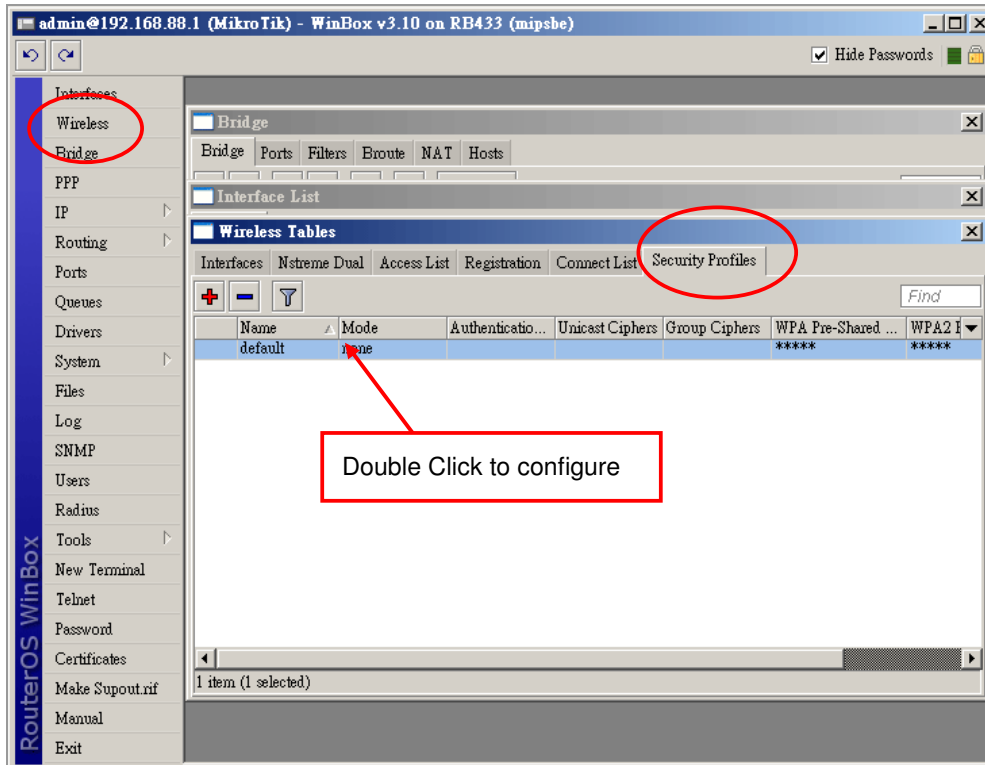
Pinging 192.168.88.25 with 32 bytes of data:

Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=2ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
Reply from 192.168.88.25: bytes=32 time=1ms TTL=128
```

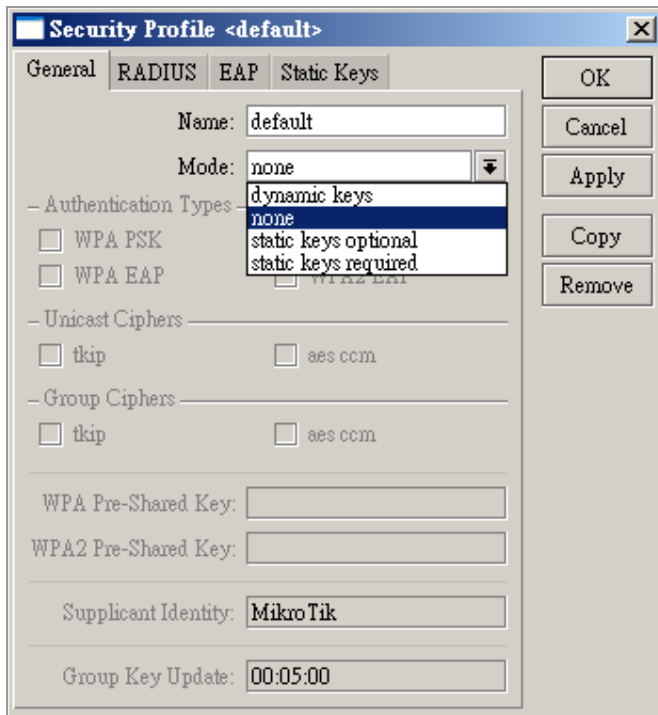
Security Connection Configuration

In this document, we introduce WEP, WPA and WPA2 encryption in Mikrotik. Please note that WHA-5500CPE/WHA-5500CPE-NT WDS mode provide WEP encryption only. If you need to use WPA and WPA2, please configure WHA-5500CPE/WHA-5500CPE-NT to Client Infrastructure mode.

Click "Wireless" → "Security Profiles", and double click on default profile.

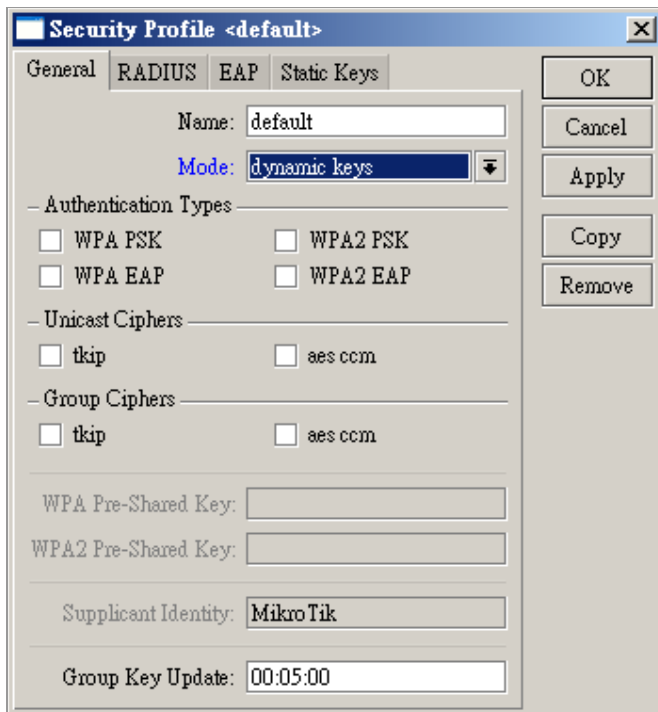


It then pops up the Security Profile <default> dialog.



In security mode, “dynamic keys” is to set WPA and WPA2 encryption and “static keys“ is to set WEP encryption.

When select “dynamic keys”, you can select Authentication Types, Unicast Ciphers and Group Ciphers.



When select “static keys”, you have to fill the key in “Static Keys” dialog.

Security Profile <default> [X]

General | RADIUS | EAP | **Static Keys**

Key 0: none [v] 0x []

Key 1: 104 bit wep
40bit wep [v] 0x []

Key 2: aes-ccm
none [v] 0x []

Key 3: none [v] 0x []

Transmit Key: key 0 [v]

St. Private Key: none [v] 0x []

OK
Cancel
Apply
Copy
Remove