

# Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers

Moxa Technical Support Team  
[support@moxa.com](mailto:support@moxa.com)

## Contents

- 1. Introduction..... 2**
- 2. Applicable products ..... 2**
- 3. System Requirements ..... 2**
- 4. System Overview ..... 2**
- 5. Cisco Controller: Basic Configuration ..... 3**
  - 5.1. Enabling the WLAN Function ..... 3**
- 6. Moxa NPort W2x50A Configuration ..... 5**
  - 6.1. Configuring the NPort W2x50A with the Wizard..... 5**
- Figure 15..... 8**
- 7. Configuring WLAN to Accept Bridged Devices ..... 8**
  - 7.1. WLC Settings: Enabling Passive Client..... 8**
  - 7.2. W2x50A Settings: Enabling Ethernet Bridge.....10**
- 8. Testing Ethernet Bridge ..... 10**
  - 8.1. Testing Ethernet Bridge.....10**

# Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

## 1. Introduction

This application note describes the process of setting up Ethernet Bridge mode for the following products: 1) Moxa's wireless NPort W2x50A series, and 2) Cisco's 2100/2500/4400/5500/Flex 7500 series wireless LAN controllers.

## 2. Applicable products

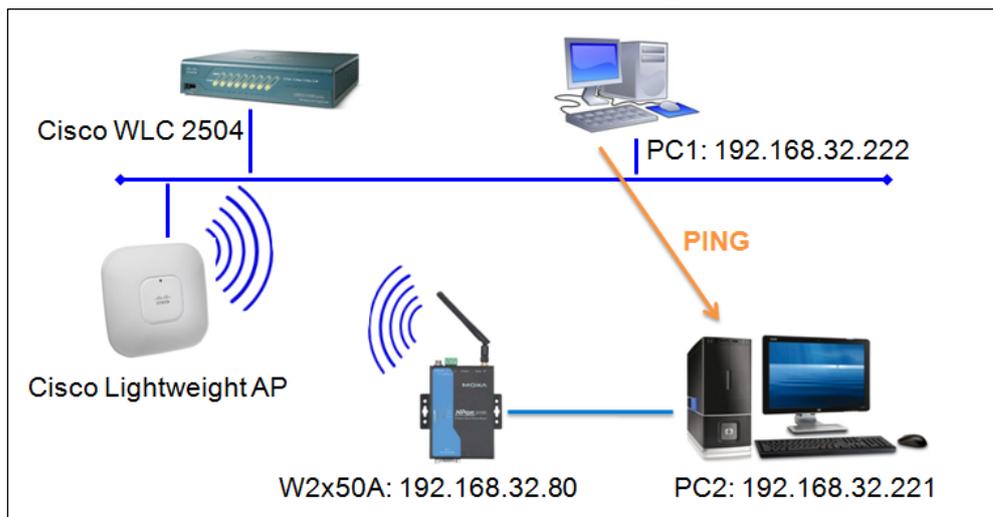
Product Line	Model Name
NPort W2x50A Series	NPort W2150A, NPort W2250A

## 3. System Requirements

Description	Model / File Name	S/W Version
Cisco WLC	WLC 2100/2500/4400/5500/Flex 7500 Series	7.6.120.0 or later
Cisco Lightweight AP	AIR-LAP1142N-T-K9 (Boot Version) (IOS Version) (Mini IOS Version)	12.4.23.3 15.2(4)JB5\$ 7.3.1.73
Moxa NPort W2x50A Series	W2x50A	FW Ver 1.8 or later

## 4. System Overview

The test system architecture is shown below in Figure 1.



**Figure 1: Test system architecture**

# Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

## 5. Cisco Controller: Basic Configuration

### 5.1. Enabling the WLAN Function

5.1.1. Log in to the controller's web graphical user interface (GUI) with username and password.

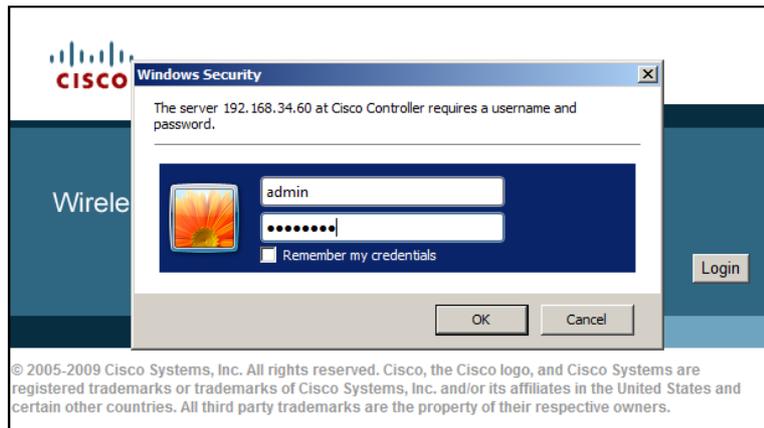


Figure 2

5.1.2. Open the controller's web GUI and click the **WLANs** tab. Select **Create New** to create a new profile for the wireless connection, and then click **Go**.



Figure 3

5.1.3. Type the **Profile Name** and **SSID** in the input boxes, and then click **Apply**.



Figure 4

## Moxa Tech Note Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers

5.1.4. Navigate to **Security** → **Layer 2**, and then select **WPA+WPA2**.



Figure 5

5.1.5. Select **WPA2** for **Policy** and **AES** for **WPA2 Encryption**. Enable **PSK** for **Authentication Key Management**, choose **ASCII** for **PSK Format**, and enter the passphrase in the PSK Format input box (we use "1234567890" to illustrate).

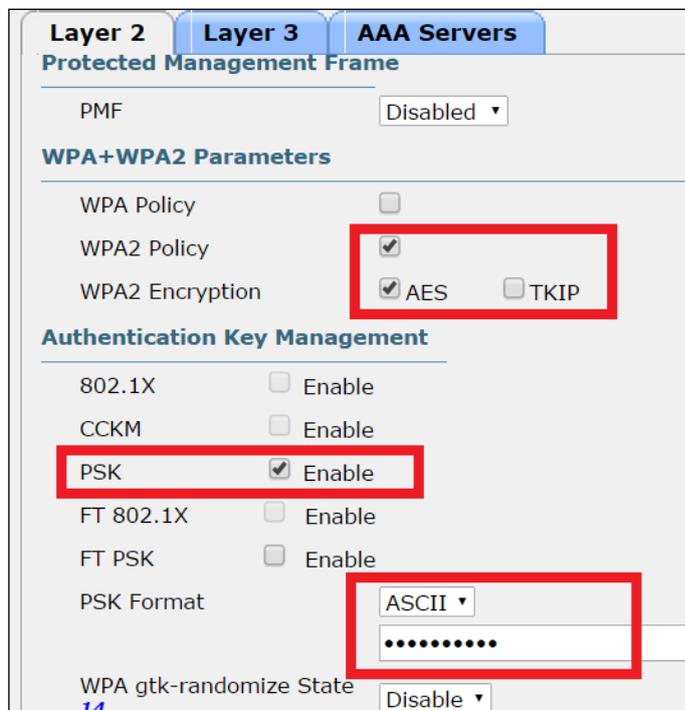


Figure 6

## Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

5.1.6. Return to the **General** tab and check the **Enabled** checkbox next to **Status**, and then click **Apply**. At this point, the basic wireless settings are done, and a wireless client will now be able to find the AP with an SSID TS-TEST.

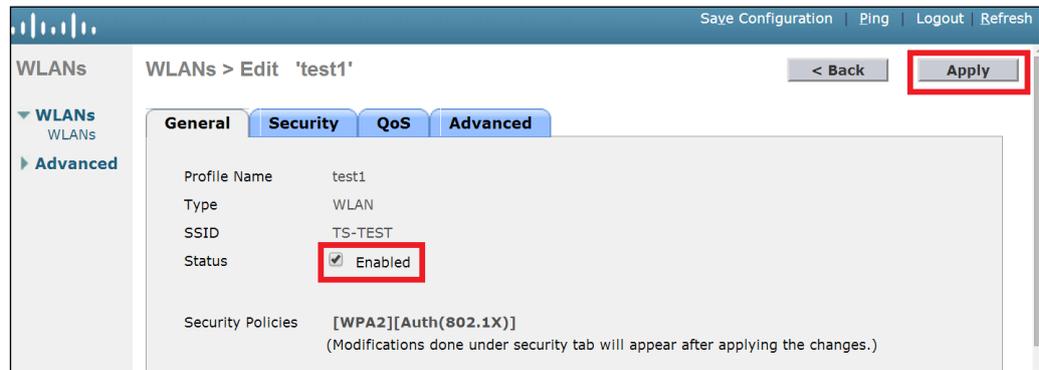


Figure 7

## 6. Moxa NPort W2x50A Configuration

### 6.1. Configuring the NPort W2x50A with the Wizard

6.1.1. Use an Ethernet cable to connect the NPort W2x50A to the network. Start **NPort Search Utility** and locate the **NPort W2x50A**. Double click on the selected **NPort W2x50A** to open the web console.

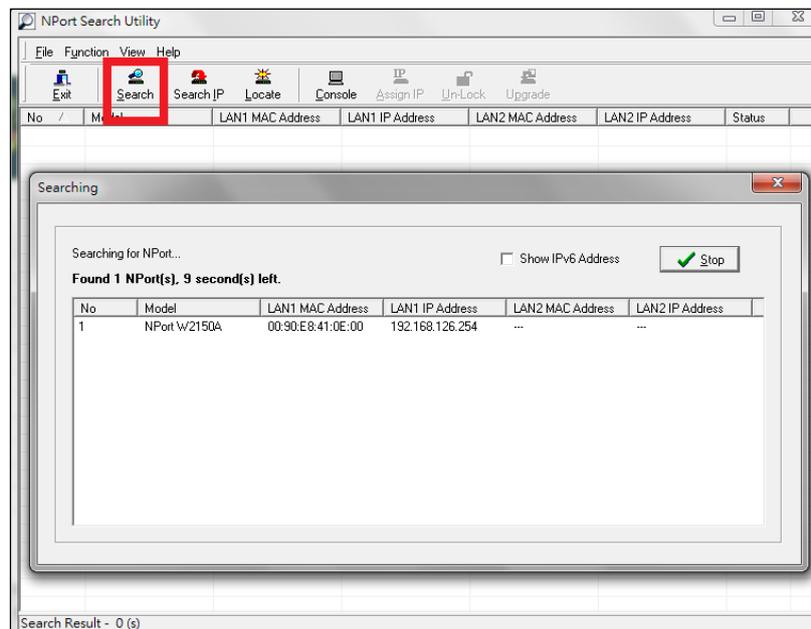
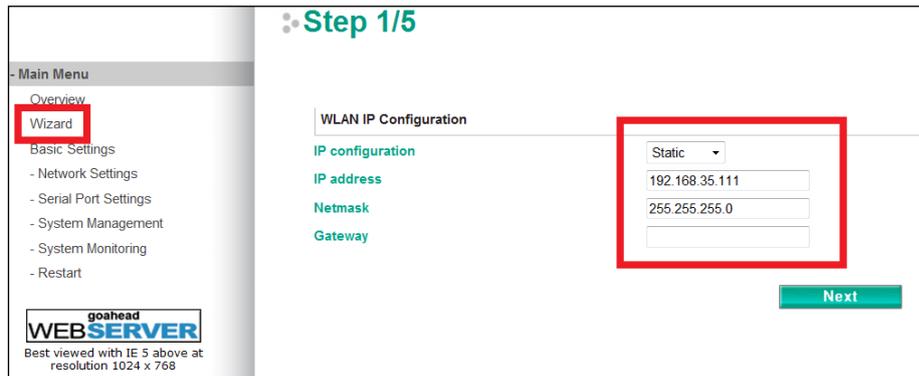


Figure 8

## Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

6.1.2. Click **Wizard** in the Main Menu and then take the following steps to configure the NPort W2x50A's wireless connection.

**Step 1:** Input your NPort W2x50A's **WLAN IP Configuration**, and then click **Next**.



The screenshot shows the configuration wizard interface. On the left, the 'Main Menu' includes 'Wizard' (highlighted with a red box). The main area is titled 'Step 1/5' and 'WLAN IP Configuration'. Under 'IP configuration', there are three fields: 'IP address' (192.168.35.111), 'Netmask' (255.255.255.0), and 'Gateway'. A 'Static' dropdown menu is also visible. A 'Next' button is at the bottom right.

**Figure 9**

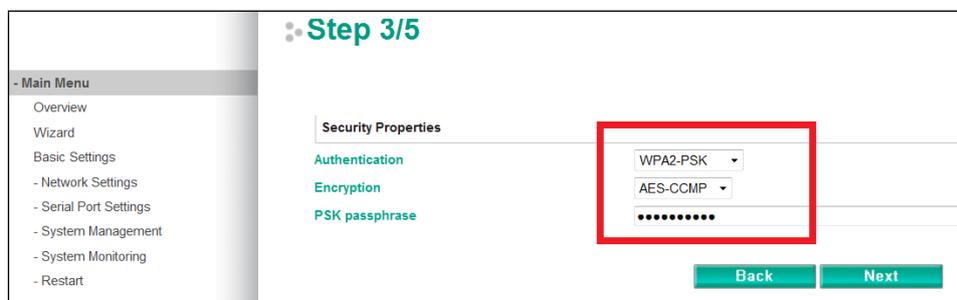
6.1.3. **Step 2:** Input the SSID for WLAN set-up, and then click **Next**. The SSID should be the same as for the Cisco controller configured in Step 5.1.3.



The screenshot shows the configuration wizard interface. On the left, the 'Main Menu' includes 'Wizard' (highlighted with a red box). The main area is titled 'Step 2/5' and 'General Properties'. Under 'Network type', 'Infrastructure Mode' is selected. Under 'SSID', 'TS-TEST' is entered. 'Back' and 'Next' buttons are at the bottom.

**Figure 10**

6.1.4. **Step 3:** Choose the authentication and encryption options that match the Cisco controller settings, and then click **Next**.



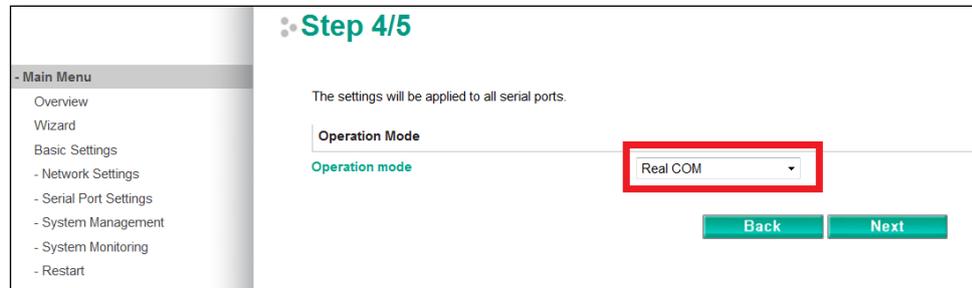
The screenshot shows the configuration wizard interface. On the left, the 'Main Menu' includes 'Wizard' (highlighted with a red box). The main area is titled 'Step 3/5' and 'Security Properties'. Under 'Authentication', 'WPA2-PSK' is selected. Under 'Encryption', 'AES-CCMP' is selected. A 'PSK passphrase' field with masked characters is also visible. 'Back' and 'Next' buttons are at the bottom.

**Figure 11**

## Moxa Tech Note Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers

(NOTE: The PSK passphrase is "1234567890", the same as for the Cisco WLC setting.)

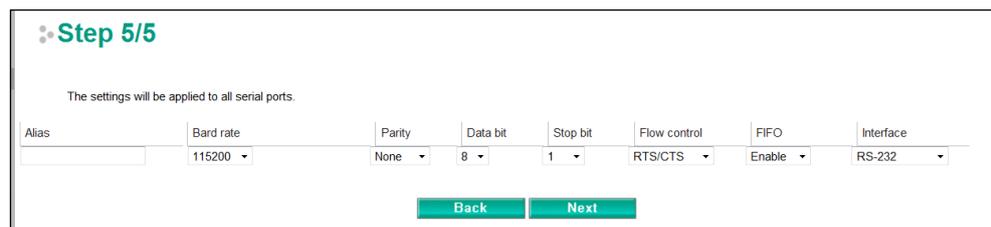
6.1.5. **Step 4:** Choose an **Operation Mode** for the W2x50A serial port to run, and then click **Next**.



The screenshot shows a configuration wizard interface. On the left is a 'Main Menu' sidebar with options: Overview, Wizard, Basic Settings, - Network Settings, - Serial Port Settings, - System Management, - System Monitoring, and - Restart. The main area is titled 'Step 4/5' and contains the text 'The settings will be applied to all serial ports.' Below this, there is a section for 'Operation Mode' with a dropdown menu currently set to 'Real COM', which is highlighted with a red rectangular box. At the bottom right of the main area are two green buttons: 'Back' and 'Next'.

Figure 12

6.1.6. **Step 5:** Set up the parameters for the W2x50A's serial ports, and then click **Next**.



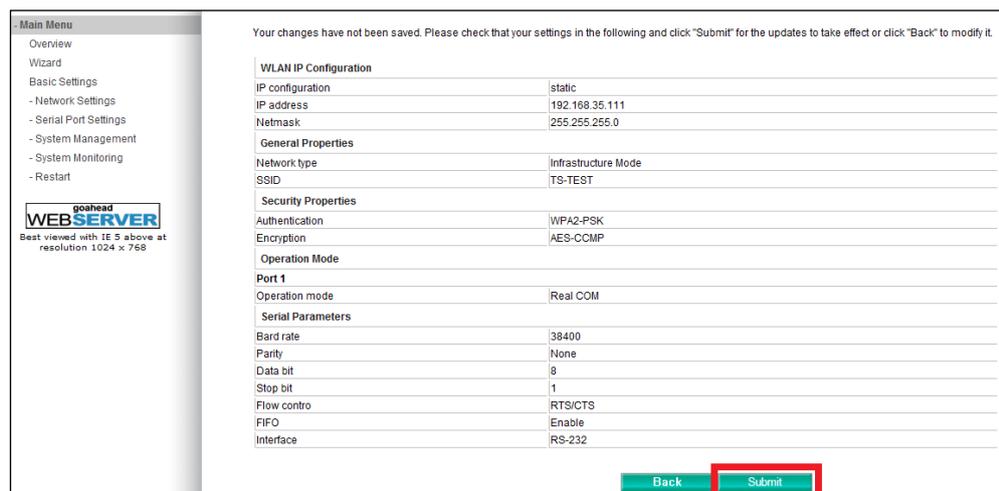
The screenshot shows a configuration wizard interface titled 'Step 5/5' with the text 'The settings will be applied to all serial ports.' Below this is a table of serial port settings:

Alias	Baud rate	Parity	Data bit	Stop bit	Flow control	FIFO	Interface
	115200	None	8	1	RTS/CTS	Enable	RS-232

At the bottom of the table are two green buttons: 'Back' and 'Next'.

Figure 13

6.1.7. When the Wizard displays the settings summary, click **Submit**.



The screenshot shows a configuration wizard interface displaying a settings summary. At the top, it says 'Your changes have not been saved. Please check that your settings in the following and click "Submit" for the updates to take effect or click "Back" to modify it.' The summary is organized into sections:

- WLAN IP Configuration:** IP configuration (static), IP address (192.168.35.111), Netmask (255.255.255.0).
- General Properties:** Network type (Infrastructure Mode), SSID (TS-TEST).
- Security Properties:** Authentication (WPA2-PSK), Encryption (AES-CCMP).
- Operation Mode:** Port 1, Operation mode (Real COM).
- Serial Parameters:** Baud rate (38400), Parity (None), Data bit (8), Stop bit (1), Flow contro (RTS/CTS), FIFO (Enable), Interface (RS-232).

At the bottom right are two green buttons: 'Back' and 'Submit', with the 'Submit' button highlighted by a red rectangular box.

Figure 14

## Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

6.1.8. Restart the system to activate the settings. Click **Restart** → **Restart System** → **Submit** to perform the reboot. Disconnect the Ethernet cable before booting up to enable the wireless connection.

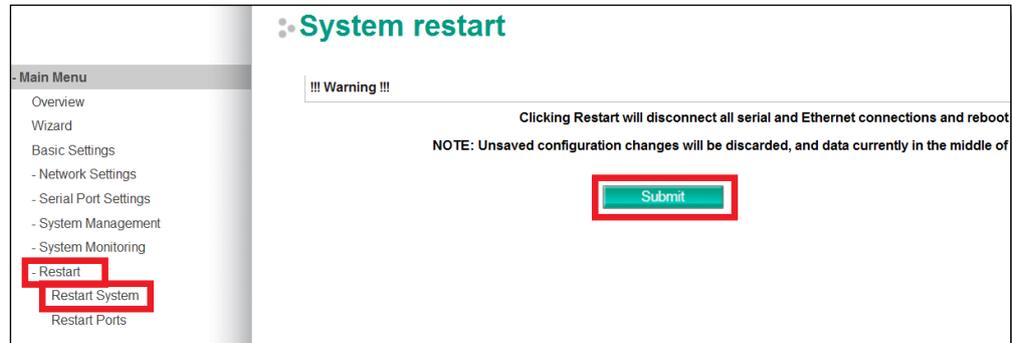


Figure 15

## 7. Configuring WLAN to Accept Bridged Devices

Network bridging is the action taken by network equipment to create an aggregate network from two or more network segments. When Ethernet Bridge mode is enabled in the W2x50A, the LAN and WLAN interfaces are bridged together. Data can be seamlessly transferred between serial lines, the LAN, and the WLAN. The LAN and WLAN will use the LAN IP setting, and the WLAN IP setting will be disabled. In what follows, we demonstrate how to configure Ethernet Bridge mode on the W2x50A and Cisco WLC.

### 7.1. WLC Settings: Enabling Passive Client

7.1.1. Open the Cisco controller's web GUI, click **CONTROLLER** → **General**, enter a Multicast IP address in the input box, and then click **Apply**.



Figure 16

## Moxa Tech Note Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers

7.1.2. In the Cisco controller's web GUI, select **CONTROLLER** → **Multicast**, select **Enable Global Multicast Mode**, and then click **Apply**.



Figure 17

7.1.3. In the Cisco controller's web GUI, click **WLANs** → **(WLAN ID)** → **Advanced**, select **Passive Client**, and click **Apply**.

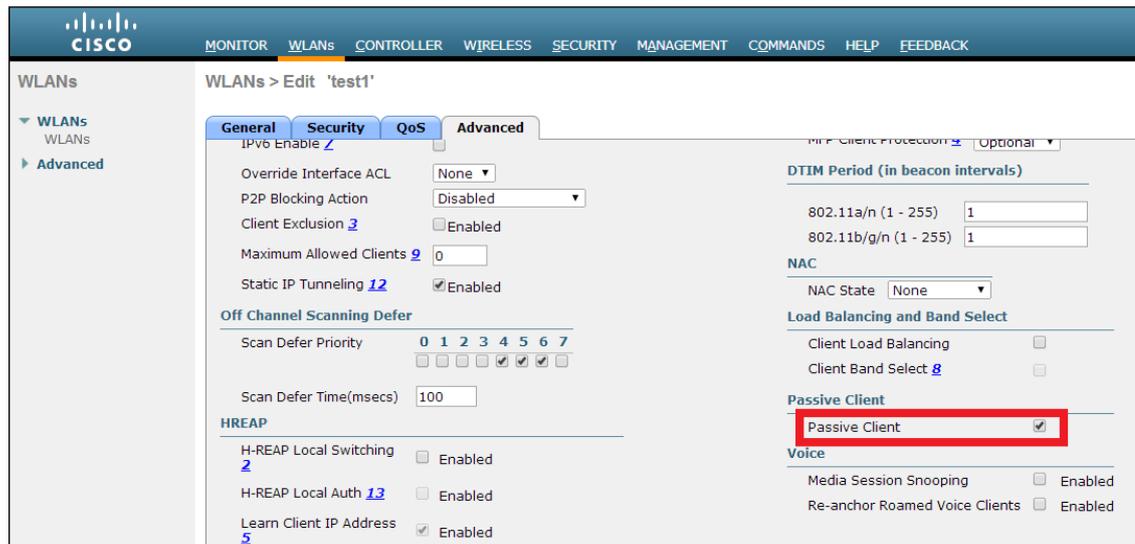


Figure 18

NOTE: According to Cisco, WLC only supports 8 MAC addresses behind a non-Cisco wireless client. For more details, please refer to the FAQ link below:

<http://www.cisco.com/c/en/us/support/docs/wireless/aironet-340-series/8018-workgroup-b-ridge-faq.html#q18>

## Moxa Tech Note Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers

### 7.2. W2x50A Settings: Enabling Ethernet Bridge

7.2.1. Open the NPort W2x50A web console.

Choose **Network Settings** → **Ethernet/Bridge Settings**, select Ethernet bridge to **Enable** and assign an **IP address** and **Netmask** to the W2x50A, and then click **Submit**. The W2x50A will reboot and adopt the new settings.

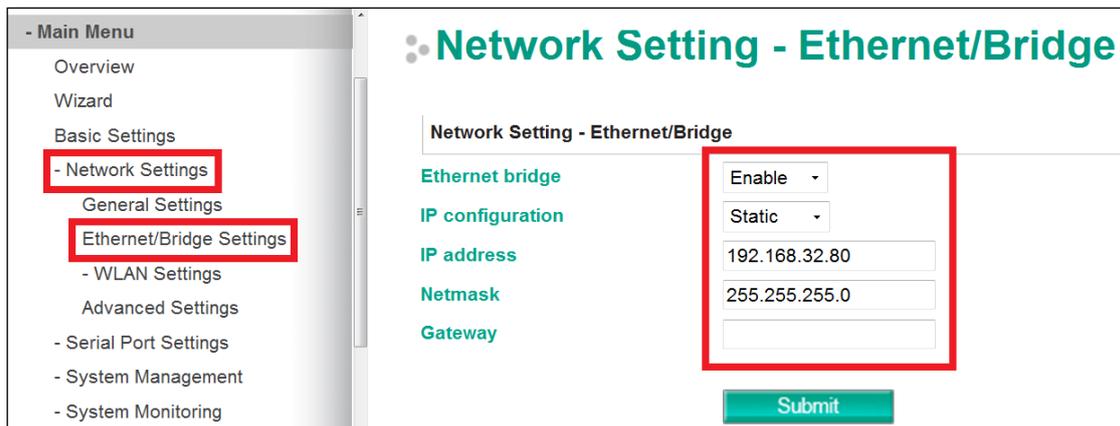


Figure 19

NOTE: When Ethernet Bridge mode is enabled, the LAN and WLAN will both use the LAN IP setting, and the WLAN IP setting will be disabled.

## 8. Testing Ethernet Bridge

### 8.1. Testing Ethernet Bridge

8.1.1. Connect the Cisco WCL + AP, W2x50A as described in the system overview on Page 2 (Figure 1). Check the WLC to see if the W2x50A has successfully established a connection with the Cisco AP. You will see the IP and MAC address of PC2 if the Passive Client is enabled. Click **Monitor** → **Client** and check to see if your W2x50A shows up in the list.

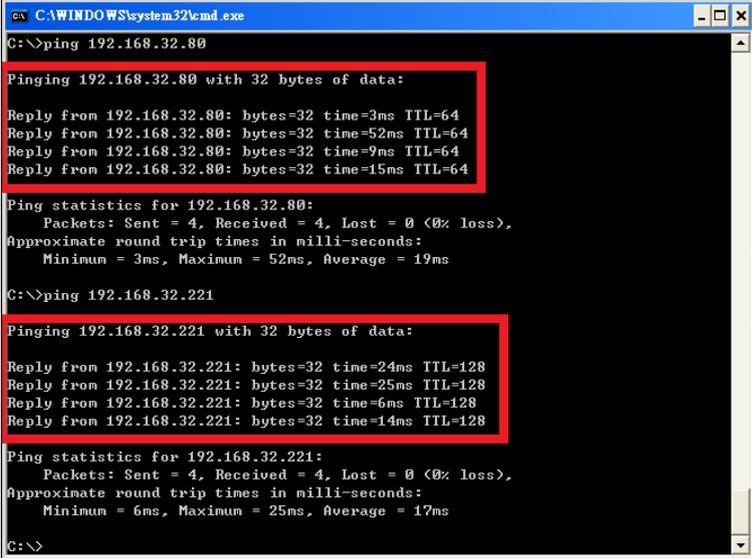


Figure 20

## Moxa Tech Note **Enabling Ethernet Bridge Mode on the NPort W2x50A with Cisco 2100/2500/4400/5500/Flex 7500 Series Wireless LAN Controllers**

---

8.1.2. Ping both the W2x50A and PC2 from PC1; you will be able to reach both of them at the same time.



```
cmd C:\WINDOWS\system32\cmd.exe
C:\>ping 192.168.32.80

Pinging 192.168.32.80 with 32 bytes of data:

Reply from 192.168.32.80: bytes=32 time=3ms TTL=64
Reply from 192.168.32.80: bytes=32 time=52ms TTL=64
Reply from 192.168.32.80: bytes=32 time=9ms TTL=64
Reply from 192.168.32.80: bytes=32 time=15ms TTL=64

Ping statistics for 192.168.32.80:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 52ms, Average = 19ms

C:\>ping 192.168.32.221

Pinging 192.168.32.221 with 32 bytes of data:

Reply from 192.168.32.221: bytes=32 time=24ms TTL=128
Reply from 192.168.32.221: bytes=32 time=25ms TTL=128
Reply from 192.168.32.221: bytes=32 time=6ms TTL=128
Reply from 192.168.32.221: bytes=32 time=14ms TTL=128

Ping statistics for 192.168.32.221:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 25ms, Average = 17ms

C:\>
```

**Figure 21**

NOTE: W2x50A IP Address: 192.168.32.80; PC2 IP Address: 192.168.32.221.