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

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Contents

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Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things. With 35 years of industry experience, Moxa has connected more than 82 million devices worldwide and has a distribution and service network that reaches customers in more than 80 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for industrial communications infrastructures. Information about Moxa's solutions is available at www.moxa.com.

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1   Introduction

This application note describes 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 Names
NPort W2x50A Series	NPort W2150A, NPort W2250A

3   System Requirements

Description	Model / File Name	S/W Ver.
Cisco WLC	WLC 2100/2500/4400/ 5500/Flex 7500 Series	7.6.120.0 or later
Cisco Lightweight AP	AIR-LAP1141N-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

Moxa Tech Note

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4   System Overview

The test system architecture is shown below in Figure 1.
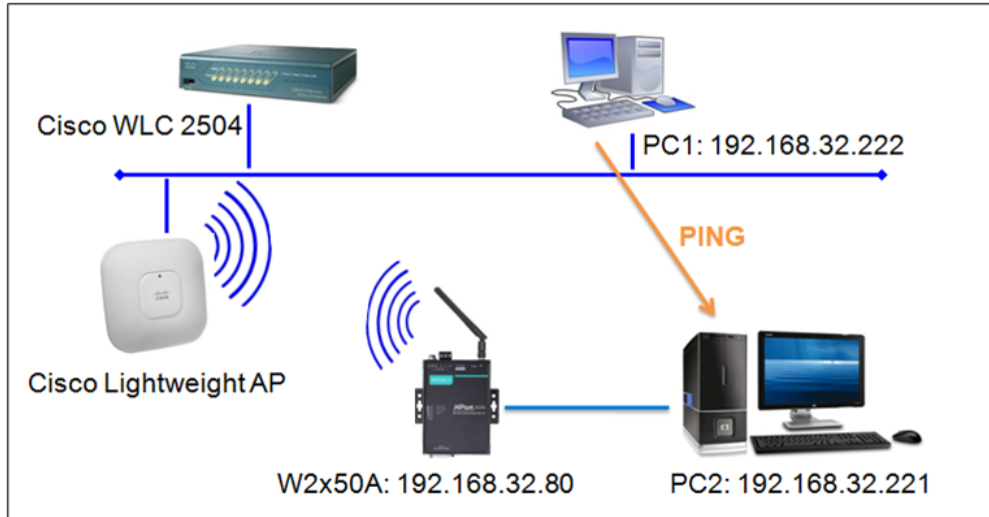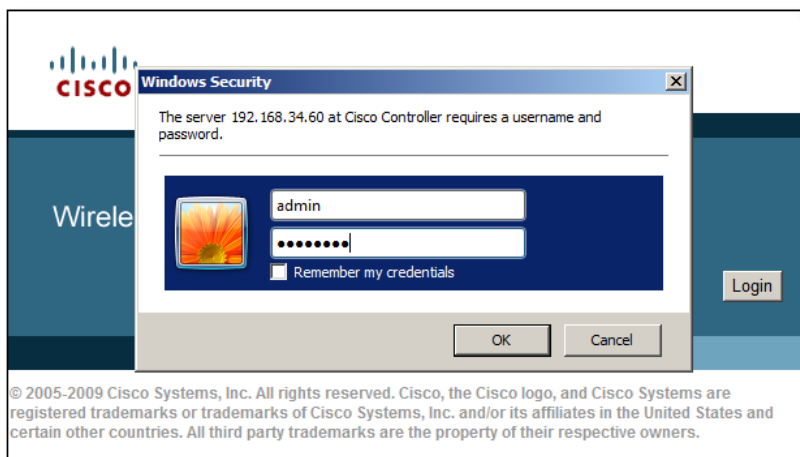

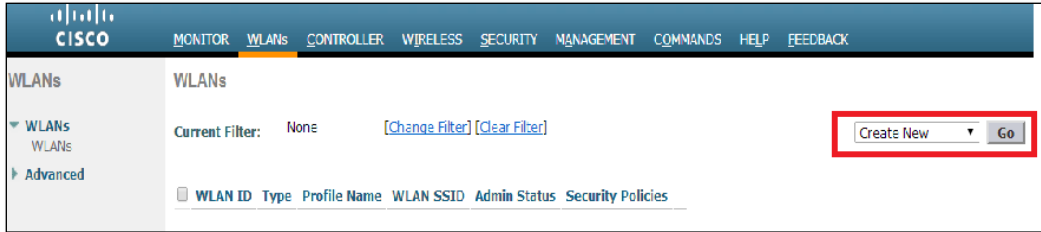**Figure 1: Test system architecture**

# 5   Cisco Controller: Basic Configuration

5.1   Enable the WLAN Function

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

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**.
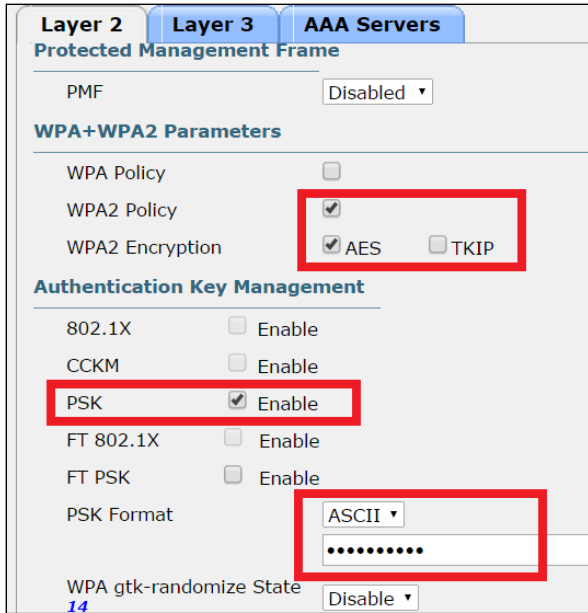

3. Type the **Profile Name** and **SSID** in the input boxes, and then click **Apply**.
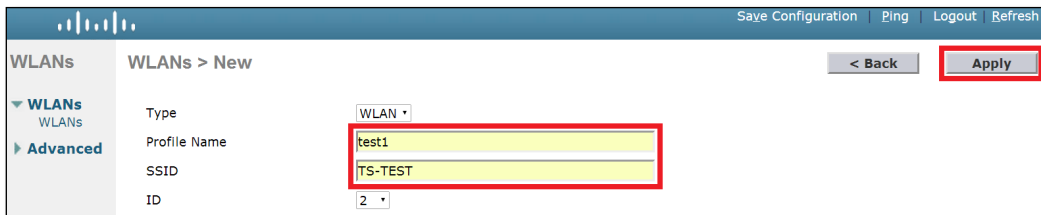
4. Navigate to **Security > Layer 2**, and then select **WPA+WPA2**.

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).


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.
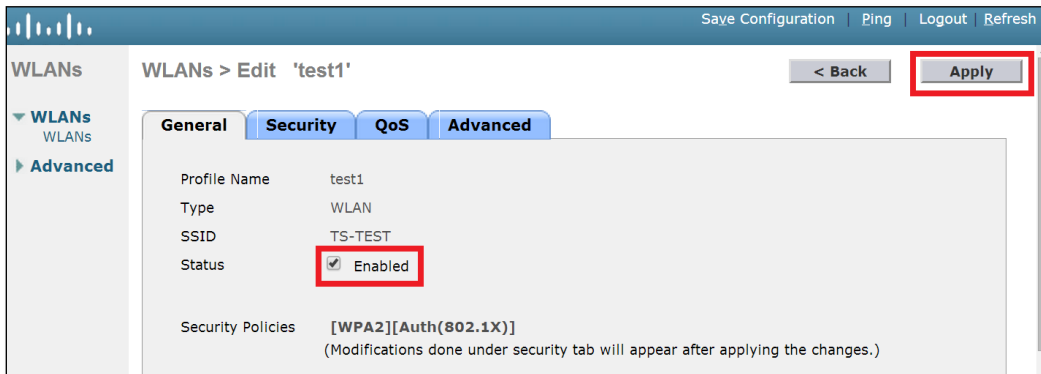
6   Moxa NPort W2x50A Configuration

## 6.1   Configuring the NPort W2x50A with the Wizard

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.
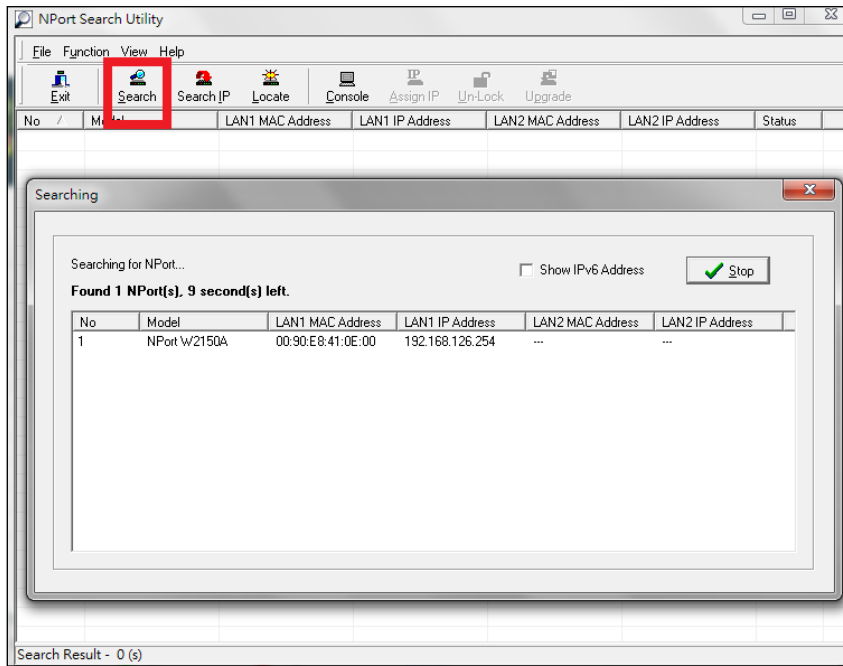

2. Click **Wizard** in the Main Menu and then take the following steps to configure the NPort W2x50A's wireless connection.

    a. **Step 1:** Enter the NPort W2x50A's **WLAN IP Configuration** and then click **Next**.
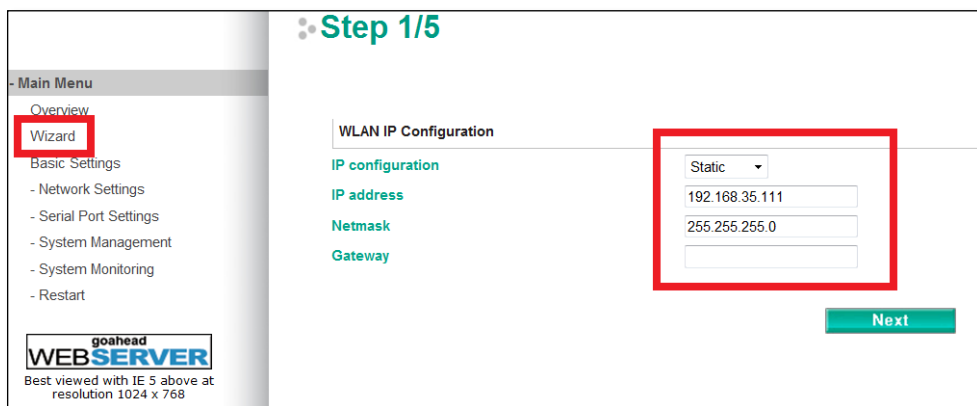
    b. **Step 2:** Input the SSID for WLAN set-up, and then click **Next**. The SSID should be the same as for the Cisco controller configured in Step 5.1.3.
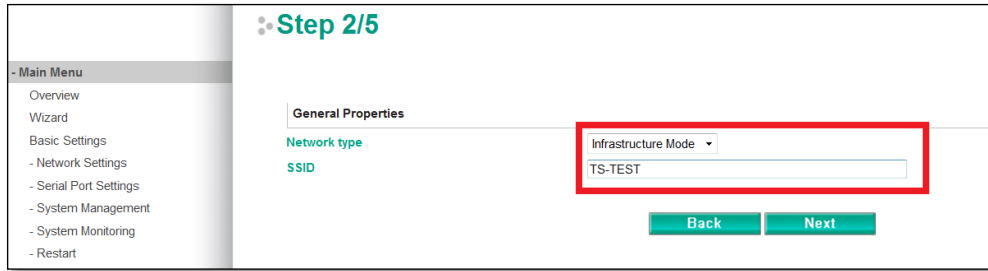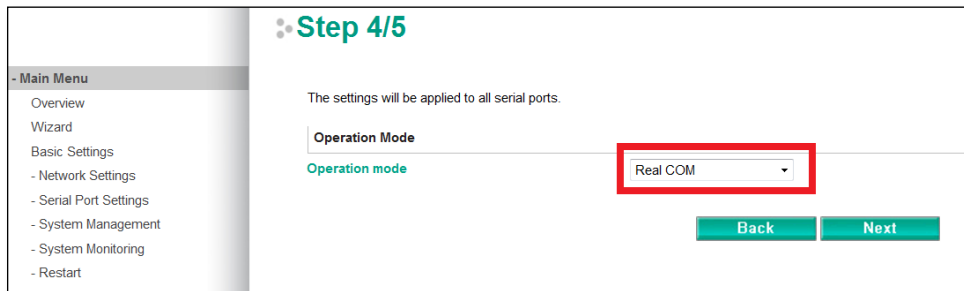
c. **Step 3:** Choose the authentication and encryption options that match the Cisco controller settings, and then click **Next**.
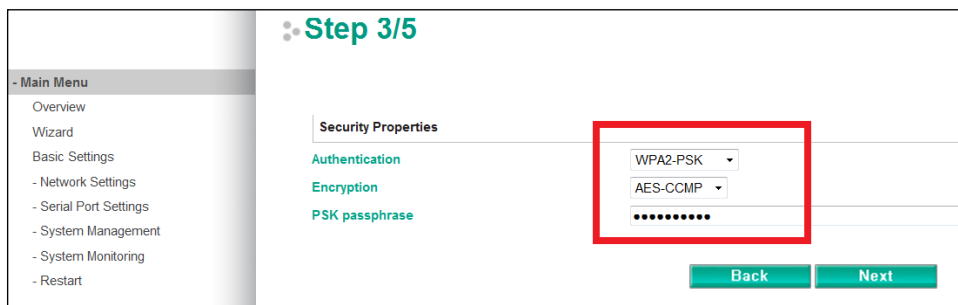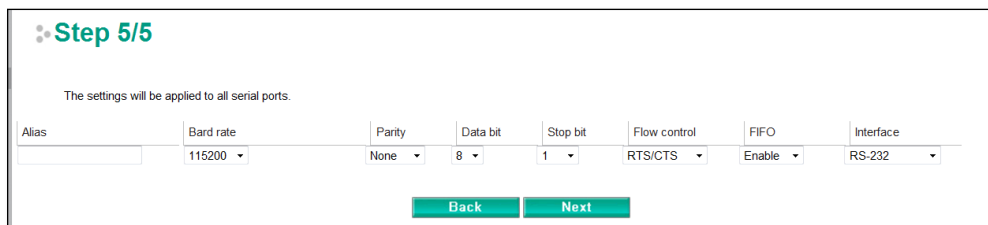

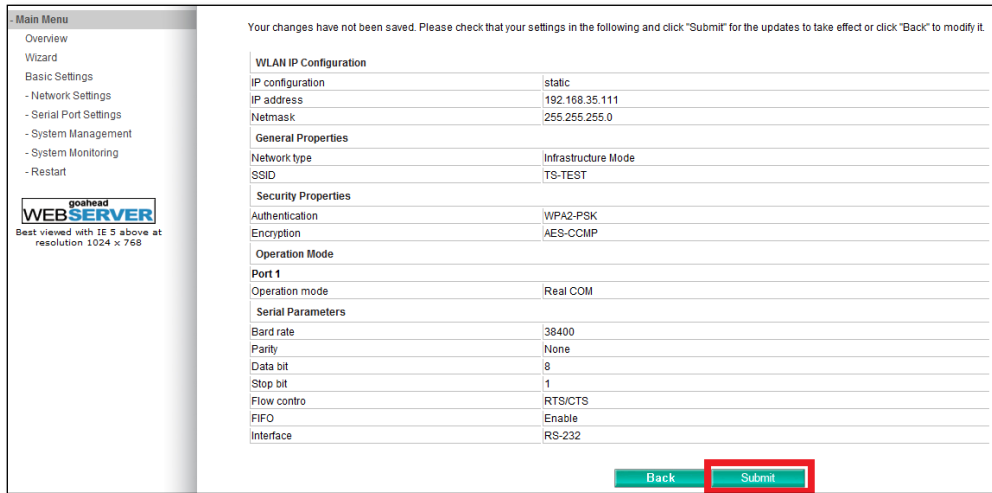**Note**   The PSK passphrase is "1234567890", the same as for the Cisco WLC setting.

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

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

3. 6.1.7.   When the Wizard displays the settings summary, click **Submit**.

4. 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.
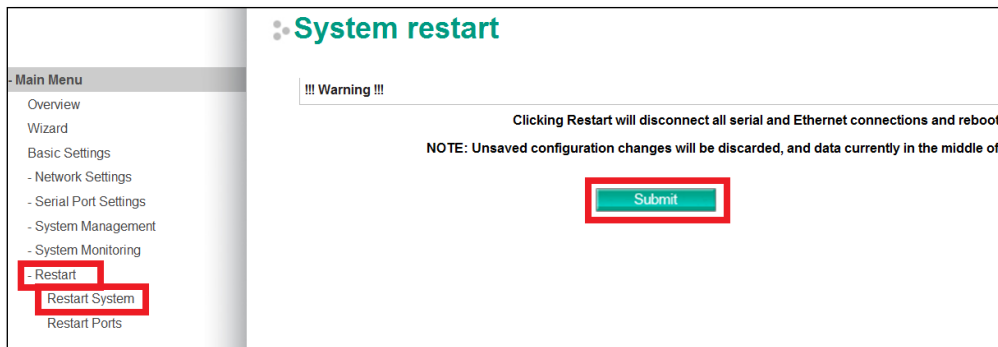
7   Configuring WLAN to Accept Bridged Devices

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 show how to configure Ethernet Bridge mode on the W2x50A and Cisco WLC.

7.1   WLC Settings: Enabling Passive Client

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

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

3. In the Cisco controller's web GUI, click **WLANs > (WLAN ID) > Advanced**, select **Passive Client**, and click **Apply**.
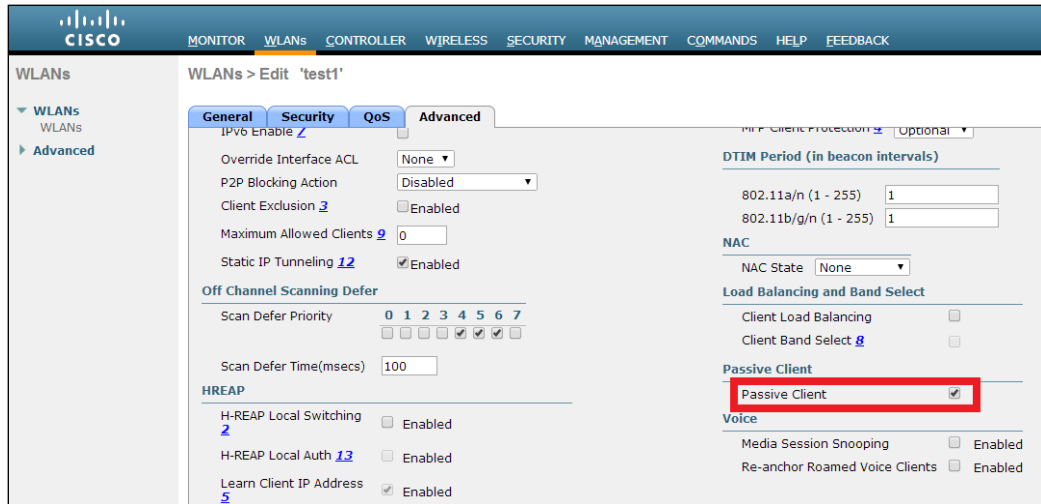
Note	According to Cisco, WLC only supports 8 MAC addresses behind a non-Cisco wireless client. For more details, please refer to the FAQ link below: http://www.cisco.com/c/en/us/support/docs/wireless/aironet-340-series/8018-workgroup-bridge-faq.html#q18

7.2 W2x50A Settings: Enabling Ethernet Bridge

1. Open the NPort W2x50A web console.

2. 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.

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

1. Connect the Cisco WCL + AP, W2x50A as described in the system overview on Page 3 (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.

2. Ping both the W2x50A and PC2 from PC1; you will reach both of them at the same time.

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