

Wireless LAN Controller Module IP Addressing Plan

Location	LAPs VLAN 24	WLCM VLAN 25	Default VLAN VLAN 26	Guest VLAN VLAN 27
Site 1	192.168.14.0	192.168.15.0	192.168.16.0	192.168.17.0
Site 2	192.168.22.0	192.168.23.0	192.168.24.0	192.168.25.0
Site 3	192.168.30.0	192.168.31.0	192.168.32.0	192.168.33.0
Site 4	192.168.38.0	192.168.39.0	192.168.40.0	192.168.41.0
Site 5	192.168.46.0	192.168.47.0	192.168.48.0	192.168.49.0
Site 6	192.168.54.0	192.168.55.0	192.168.56.0	192.168.57.0
Site 7	192.168.62.0	192.168.63.0	192.168.64.0	192.168.65.0
Site 8	192.168.70.0	192.168.71.0	192.168.72.0	192.168.73.0
Site 9	192.168.78.0	192.168.79.0	192.168.80.0	192.168.81.0
Site 10	192.168.86.0	192.168.87.0	192.168.88.0	192.168.89.0
Site 11	192.168.94.0	192.168.95.0	192.168.96.0	192.168.97.0
Site 12	192.168.102.0	192.168.103.0	192.168.104.0	192.168.105.0
Site 13	192.168.110.0	192.168.111.0	192.168.112.0	192.168.113.0
Site 14	192.168.118.0	192.168.119.0	192.168.120.0	192.168.121.0
Site 15	192.168.126.0	192.168.127.0	192.168.128.0	192.168.129.0
Site 16	192.168.134.0	192.168.135.0	192.168.136.0	192.168.137.0
Site 17	192.168.142.0	192.168.143.0	192.168.144.0	192.168.145.0
Site 18	192.168.150.0	192.168.150.0	192.168.151.0	192.168.152.0
Site 19	192.168.158.0	192.168.159.0	192.168.160.0	192.168.161.0
Site 20	192.168.166.0	192.168.167.0	192.168.168.0	192.168.169.0
Site 21	192.168.174.0	192.168.175.0	192.168.176.0	192.168.177.0
Site 22	192.168.182.0	192.168.183.0	192.168.184.0	192.168.185.0
Site 23	192.168.190.0	192.168.191.0	192.168.192.0	192.168.193.0
Site 24	192.168.198.0	192.168.199.0	192.168.200.0	192.168.201.0
Site 25	192.168.206.0	192.168.207.0	192.168.208.0	192.168.209.0
Site 26	192.168.214.0	192.168.215.0	192.168.216.0	192.168.217.0
Site 27	192.168.222.0	192.168.223.0	192.168.224.0	192.168.225.0
Site 28	192.168.230.0	192.168.231.0	192.168.232.0	192.168.233.0
Site 29	192.168.238.0	192.168.239.0	192.168.240.0	192.168.241.0
Site 30	192.168.246.0	192.168.247.0	192.168.248.0	192.168.249.0



Set Up Your Wireless LAN Controller Module

[Home](#) > [Work With My Wireless Devices](#) > [Cisco Wireless Devices](#) > Set Up Your Wireless LAN Controller Module

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Download PDF

[Step 2: Set Up Your Cisco Wireless LAN Controller Module Hardware](#)

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:

Email:

Step 2: Set Up Your Cisco Wireless LAN Controller Module Hardware

Step 1: [SMB Support Assistant Site Survey](#)

Step 2: **Set Up Your Cisco Wireless LAN Controller Module Hardware**

[Introduction](#)

[Requirements](#)

[Set Up Your Wireless LAN Controller Module Hardware](#)

[Prepare to Install the Wireless LAN Controller Module](#)

[Install the Wireless LAN Controller Module](#)

[Reconnect the Router to the Network](#)

[Next Step](#)

[Troubleshoot the Procedure](#)

[Related Information](#)

Step 3: [Configure Your Router for the Wireless LAN Controller Module](#)

Step 4: [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)

Step 5: [Configure the Cisco Wireless LAN Controller Module](#)

Step 6: [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)

Step 7: [Add a Lightweight Access Point to Your Wireless Network](#)

Introduction

This document provides a simplified set of instructions on how to install the Cisco Wireless LAN Controller Module (WLCM) in your Integrated Services Router (ISR). To view complete instructions, refer to the documentation included with your WLCM and router.

[Back to Top](#)

Requirements

To set up your WLCM hardware, you need these items:

- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - ISR Router Worksheet
 - Wireless Worksheet
- A Cisco 2800 or 3800 Integrated Services Router (ISR) with an available single-wide network module slot. For more information, refer to the documentation included with your module.

Note: The Cisco 2801 ISR does not support the WLCM.

Note: A single router chassis does not support multiple WLCMs.

- A router with IOS version 12.4(2)XA1 or higher. To upgrade your router IOS version, refer to [Upgrade the Software Image on a Cisco Router](#).
- You must have reviewed the regulatory compliance and safety information included with your wireless controller module and router.
- A Number 1 Phillips screwdriver or small flat-blade screwdriver

- An ESD-preventive wrist strap. For further information about how to prevent ESD damage to your equipment, refer to the documentation included with your router.
- Tape to secure the DC circuit breaker handle

[Back to Top](#)

Set Up Your Wireless LAN Controller Module Hardware

Follow these steps to set up your Wireless LAN Controller Module (WLCM) hardware:

Prepare to Install the Wireless LAN Controller Module

Follow these steps to prepare to install the Wireless LAN Controller Module (WLCM):

1. Wear an ESD-preventive wrist strap that you provide. Ensure that the the wrist strap makes good skin contact. For more information about ESD, refer to the documentation included with your WLCM and router.
2. Move the power switch to the OFF (O) position to turn off electrical power to the router. Leave the power cable plugged in to channel ESD voltages to ground.
3. Remove power from the DC circuit connected to the router. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.
4. Remove all network and telephone cables from the router.

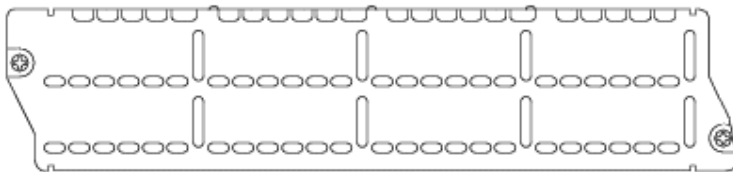
Note: Make a note of where each cable is connected to the router so that you can restore the connections later.

Install the Wireless LAN Controller Module

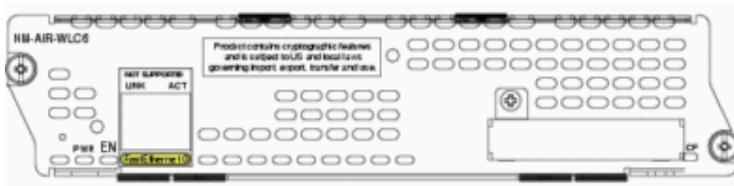
This section explains how to install the Cisco Wireless LAN Controller Module (WLCM) in your Cisco router.

1. Use either a number 1 Phillips screwdriver or a small flat-blade screwdriver to remove the blank faceplates installed over the slot you intend to use. This example shows a blank network module panel with screws.

Note: Save blank faceplates for future use.



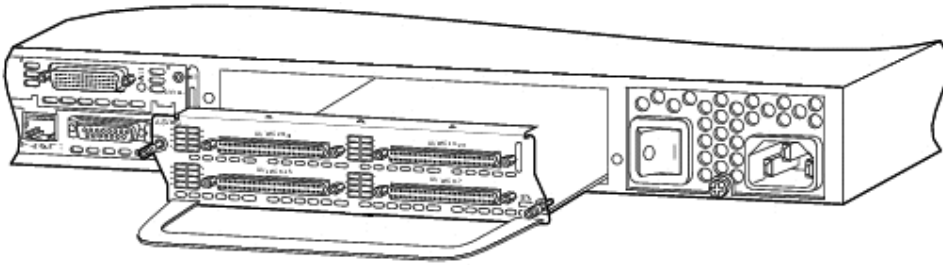
2. Remove the WLCM from the packing.



Note: The FastEthernet port on the front of the WLCM is not operational and is not supported. The WLCM communicates with the router through the wlan-controller interface inside the router.

3. Align the module with the guides in the chassis walls or slot divider and slide it gently into the slot.

Note: This image displays an example network module. The front panel of the WLCM will look different.



4. Use the network module handle to push the module into place until you feel the edge connector seat securely into the connector on the router backplane. The network module faceplate should contact the chassis rear panel.
5. Align the captive screws with the screw holes on the chassis. Use either a number 1 Phillips screwdriver or a small flat-blade screwdriver to tighten the captive screws until the module faceplate is flush with the chassis.

Reconnect the Router to the Network

Follow these steps to reconnect the router to the network:

1. Remove the tape from the DC circuit handle and restore the circuit breaker to the ON position.
2. Reattach the network and telephone cables to the router.
3. Move the power switch to the ON (|) position to restore power to the router.

[Back to Top](#)

Next Step

You have completed this procedure. To configure the WLCM, proceed to [Configure Your Router for the Wireless LAN Controller Module](#).

To make further changes to the wireless network, refer to the [Wireless Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
The WLCM does not fit properly in the router.	<ul style="list-style-type: none"> • Ensure that you have a 2800 or 3800 series integrated services router (ISR) or a 3700 series routers. The Cisco 2801 integrated services router does not support the WLCM. • Ensure that you install the WLCM in a single-wide network module slot. The WLCM is not supported in EVM slots available in the Cisco 2821 and Cisco 2851 integrated services routers. For more information, refer to the documentation included with your module. • For further assistance, contact the SMB Technical

	Assistance Center (SMB TAC).
The FastEthernet port on the front of the module is labeled Not Supported .	<ul style="list-style-type: none">• The FastEthernet port on the front of the WLCM is not operational and is not supported. The WLCM communicates with the router through the wlan-controller interface inside the router.
The PWR, EN, or CF LED does not display green when I restore power to the router.	<ul style="list-style-type: none">• Ensure that the router has fully booted. The router may take 1-2 minutes to boot.• Ensure that the captive screws are tightened and that the faceplate of the WLCM is flush with the chassis.• Contact the SMB Technical Assistance Center (SMB TAC) for assistance.

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Configure Your Router for the Wireless LAN Controller Module](#)
- [Cable Descriptions](#)



Set Up Your Wireless LAN Controller Module

Home > [Work With My Wireless Devices](#) > [Cisco Wireless Devices](#) > Set Up Your Wireless LAN Controller Module

Step 3: Configure Your Router for the Wireless LAN Controller Module

Step 1: [SMB Support Assistant Site Survey](#)

Step 2: [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)

Step 3: Configure Your Router for the Wireless LAN Controller Module

[Introduction](#)

[Requirements](#)

[WLCM Overview](#)

[The Router and the WLCM](#)

[Configure your Router to Support the WLCM](#)

[Connect to the Router](#)

[Create a DHCP Pool for Lightweight Access Points](#)

[Create a DHCP Pool for Default VLAN Users](#)

[Create a DHCP Pool for Guest VLAN Users](#)

[Configure Interfaces and Bridging](#)

[Configure Security for Wireless Guest VLAN](#)

[Configure the Management Switch Port](#)

[Move Switchports to WLCM VLANs](#)

[Next Step](#)

[Troubleshoot the Procedure](#)

[Select a Hexadecimal Value for your Controller](#)

[Create a Custom Hexadecimal Value](#)

[Related Information](#)

Step 4: [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)

Step 5: [Configure the Cisco Wireless LAN Controller Module](#)

Step 6: [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)

Step 7: [Add a Lightweight Access Point to Your Wireless Network](#)

Introduction

This document provides instructions on how to configure your Integrated Services Router to support the Wireless LAN Controller Module (WLCM).

This document shows how to configure the WLCM solution with these subnets:

VLAN	IP Address
Wireless LAPs	192.168.14.0
WLAN Controller Management	192.168.15.0
Wireless Default	192.168.16.0
Wireless Guest	192.168.17.0

If you want to set up a WLCM at more than one site, the [Wireless LAN Controller Module IP Addressing Plan](#) provides additional subnets that you can use for up to 30 sites. To set up an additional site, replace the VLAN subnets used in this document with the appropriate subnets for your site.

[Back to Top](#)

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

Download PDF

[Step 3: Configure Your Router for the Wireless LAN Controller Module Set Up Your Wireless LAN Controller Module](#)

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:
Email:

Requirements

To configure your router to support the WLCM, you need these items:

- A [console cable](#)
- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - ISR Router Worksheet
- You must have completed the steps in the [Set Up Your WLCM Hardware](#) document.

[Back to Top](#)

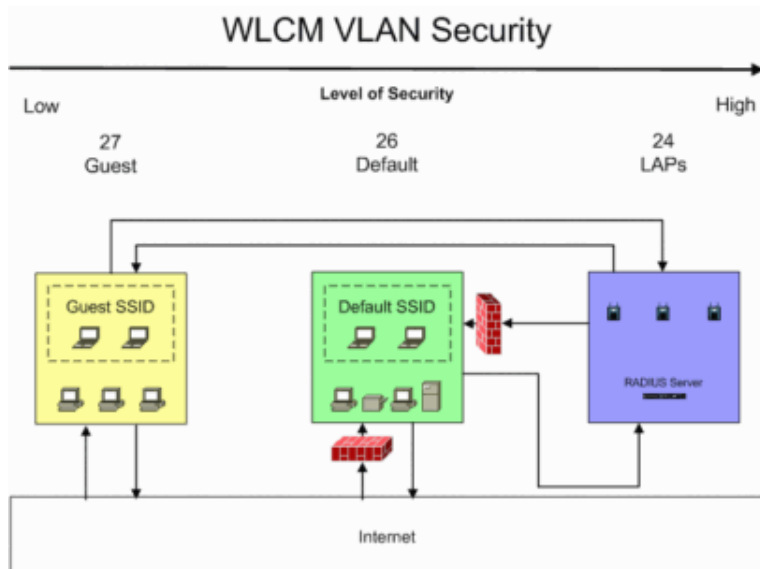
WLCM Overview

The Router and the WLCM

The Cisco Wireless LAN Controller Module (WLCM) depends on a specialized router configuration in order to communicate with other devices on the network. This document provides instructions on how to configure your router to support the WLCM.

The router configuration includes a specialized VLAN configuration that includes these VLANs:

- Lightweight Access Point (LAP) VLAN (24)
- Default VLAN (26)
- Guest VLAN (27)



Note: The WLCM configuration does not support the [Network Management VLAN \(21\)](#) and [Secure Server VLAN \(22\)](#) VLANs, and uses a different VLAN ID for the Guest VLAN. If you have assigned switchports to these VLANs, the [Move Switchports to WLCM VLANs](#) section of this document provides instructions on how to move switchports into WLCM VLANs.

The router configuration also includes a the wlan-controller interface on the router, which is used to communicate with the WLCM.

[Back to Top](#)

[Back to Top](#)

Configure your Router to Support the WLCM

Follow these steps to configure your router to support the WLCM:

Connect to the Router

To connect to your router, follow these steps:

1. [Create a HyperTerminal connection](#) to your router.
2. Log into the router with the login and password you entered in fields B10 and B11 of the Router Worksheet.

```
Username: admin
Password:
```

Note: If you do not know the password for your router, refer to [Reset the Password on the Router](#).

3. Type **enable** and press **Enter** to access the privileged mode. Type the enable password that you entered in field B12 of the Router Worksheet and press **Enter**.

```
Router> enable
Password:
Router#
```

Create a DHCP Pool for Lightweight Access Points

Follow these steps to configure a DHCP pool to provide IP addresses to Lightweight Access Points (LAPs):

1. Type **configure terminal** and press **Enter** to enter configuration mode.

```
Router#configure terminal
Router(config)#
```

2. Type **ip dhcp pool LAPs** and press **Enter**.

```
Router(config)#ip dhcp pool LAPs
Router(dhcp-config)#
```

3. Type **network 192.168.14.0 255.255.255.0** and press **Enter**.

```
Router(dhcp-config)#network 192.168.14.0 255.255.255.0
```

4. Type **default-router 192.168.14.1** and press **Enter**.

```
Router(dhcp-config)#default-router 192.168.14.1
```

5. Type **option 43 hex f104.c0a8.0e18** and press **Enter**. This value provides provides the WLCM IP address to wireless clients on the network in hexadecimal format.

Note: If you want to set up a WLCM at more than one site, see [Create a Hexadecimal Value for your Controller](#) to determine the appropriate hexadecimal value for your controller.

```
Router(dhcp-config)#option 43 hex f104.c0a8.0e18
```

6. Type **option 60 ascii "VCI-String"** and press **Enter**. For **VCI String**, use the table to determine the appropriate VCI string for your LAP model:

Model	VCI String
1130	Cisco AP c1130
1200	Cisco AP c1200
1240	Cisco AP c1240

The VCI String allows Lightweight Access Points (LAPs) to associate to the WLCM.

Note: Ensure that you enter the VCI String value in quotes.

```
Router(dhcp-config)#option 60 ascii "Cisco AP c1130"
```

7. Type **domain-name** *yourdomain* and press **Enter**. For *yourdomain*, use the domain name that you entered in field B48 of the Internet Worksheet.

```
Router(dhcp-config)#domain-name abcompany.com
```

8. Type **dns-server** *dns-server-address* and press **Enter**. For *dns-server-address*, use the DNS server IP address that you entered in field L4 of the LAN Addressing Worksheet.

```
Router(dhcp-config)#dns-server 198.168.10.1
```

9. Type **exit** and press **Enter**.

```
Router(dhcp-config)#exit
Router(config)#
```

10. Type **ip dhcp excluded-address** *192.168.14.1 192.168.14.49* and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.14.1 192.168.14.49
```

11. Type **ip dhcp excluded-address** *192.168.14.251 192.168.14.254* and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.14.251 192.168.14.254
```

Create a DHCP Pool for Default VLAN Users

Follow these steps to configure a DHCP pool for users in the Default VLAN:

1. Type **ip dhcp pool** *wlcm-default* and press **Enter**.

```
Router(config)#ip dhcp pool wlcm-default
Router(dhcp-config)#
```

2. Type **network** *192.168.16.0 255.255.255.0* and press **Enter**.

```
Router(dhcp-config)#network 192.168.16.0 255.255.255.0
```

3. Type **default-router** *192.168.16.1* and press **Enter**.

```
Router(dhcp-config)#default-router 192.168.16.1
```

4. Type **exit** and press **Enter**.

```
Router(dhcp-config)#exit
Router(config)#
```

5. Type **ip dhcp excluded-address** *192.168.16.1 192.168.16.49* and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.16.1 192.168.16.49
```

6. Type **ip dhcp excluded-address 192.168.16.251 192.168.16.254** and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.16.251 192.168.16.254
```

Create a DHCP Pool for Guest VLAN Users

Follow these steps to configure a DHCP pool for wireless users in the Guest VLAN:

1. Type **ip dhcp pool wlcg-guest** and press **Enter**.

```
Router(config)#ip dhcp pool wlcg-guest
```

```
Router(dhcp-config)#
```

2. Type **network 192.168.17.0 255.255.255.0** and press **Enter**.

```
Router(dhcp-config)#network 192.168.17.0 255.255.255.0
```

3. Type **default-router 192.168.17.1** and press **Enter**.

```
Router(dhcp-config)#default-router 192.168.17.1
```

4. Type **exit** and press **Enter**.

```
Router(dhcp-config)#exit
```

```
Router(config)#
```

5. Type **ip dhcp excluded-address 192.168.17.1 192.168.17.49** and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.17.1 192.168.17.49
```

6. Type **ip dhcp excluded-address 192.168.17.251 192.168.17.254** and press **Enter**.

```
Router(config)#ip dhcp excluded-address 192.168.17.251 192.168.17.254
```

Configure Interfaces and Bridging

Follow these steps to configure interfaces and bridging on the controller:

1. The WLCM configuration uses bridge interfaces to bridge traffic between the router WLCM interfaces and the VLAN interfaces. Follow these steps to create the bridge interfaces for the WLCM:

- a. Type **interface bvi 26** and press **Enter**.

```
Router(config)# interface bvi 26
```

```
Router(config-if)#
```

- b. Type **ip address 192.168.16.1 255.255.255.0** and press **Enter**.

```
Router(config-if)#ip address 192.168.16.1 255.255.255.0
```

- c. Type **interface bvi 27** and press **Enter**.

```
Router(config-if)#interface bvi 27
```

- d. Type **ip address 192.168.17.1 255.255.255.0** and press **Enter**.

```
Router(config-if)#ip address 192.168.17.1 255.255.255.0
```

- e. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

- Follow these steps to configure a VLAN for Lightweight Access Points (LAPs):

- a. Type **interface Vlan 24** and press **Enter**.

```
Router(config)#interface Vlan 24
Router(config-if)#
```

- b. Type **description LAP VLAN** and press **Enter**.

```
Router(config-if)#description LAP VLAN
```

- c. Type **ip address 192.168.14.1 255.255.255.0** and press **Enter**.

```
Router(config-if)#ip address 192.168.14.1 255.255.255.0
```

- d. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

- Follow these steps to configure the Default VLAN:

- a. Type **interface Vlan 26** and press **Enter**.

```
Router(config)#interface Vlan 26
Router(config-if)#
```

- b. Type **description WLCM Default VLAN** and press **Enter**.

```
Router(config-if)#description WLCM Default VLAN
```

- c. Type **bridge-group 26** and press **Enter**.

```
Router(config-if)#bridge-group 26
```

- d. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

- Follow these steps to configure the Guest VLAN:

- a. Type **interface Vlan 27** and press **Enter**.

```
Router(config)#interface Vlan 27
```

- b. Type **description WLCM Guest VLAN** and press **Enter**.

```
Router(config-if)#description WLCM Guest VLAN
```

- c. Type **Bridge-group 27** and press **Enter**.

```
Router(config-if)#Bridge-group 27
```

- d. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

- Follow these steps to configure the router interfaces to the WLAN controller:
 - a. Type **interface wlan-controller slot/port** and press **Enter**. For **slot/port**, use the slot and port number that you recorded in field B39 of the ISR Router worksheet.

```
Router(config-if)#interface wlan-controller2/0
```

- b. Type **ip address 192.168.15.1 255.255.255.0** and press **Enter**.

```
Router(config-if)#ip address 192.168.15.1 255.255.255.0
```

- c. Type **interface wlan-controller2/0.26** and press **Enter**.

```
Router(config-if)#interface wlan-controller2/0.26
```

- d. Type **encapsulation dot1Q 26** and press **Enter**.

```
Router(config-if)#encapsulation dot1Q 26
```

Note: The router can display this error message:

```
If the interface doesn't support baby giant frame
maximum mtu of the interface has to be reduced by
bytes on both sides of the connection to properly
transmit or receive large packets. Please refer to
documentation on configuring IEEE 802.1Q vLANs.
```

- e. Type **bridge-group 26** and press **Enter**.

```
Router(config-if)#bridge-group 26
```

- f. Type **interface wlan-controller2/0.27** and press **Enter**.

```
Router(config-if)#interface wlan-controller2/0.27
```

- g. Type **encapsulation dot1Q 27** and press **Enter**.

```
Router(config-if)#encapsulation dot1Q 27
```

- h. Type **bridge-group 27** and press **Enter**.

```
Router(config-if)#bridge-group 27
```

- i. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

- Follow these steps to enable interface bridging:

- a. Type **bridge irb** and press **Enter**.

```
Router(config)#bridge irb
```

- b. Type **bridge 26 route ip** and press **Enter**.

```
Router(config)#bridge 26 route ip
```

- c. Type **bridge 27 route ip** and press **Enter**.

```
Router(config)#bridge 27 route ip
```

- d. Type **exit** and press **Enter**.

```
Router(config-if)#exit
Router(config)#
```

Configure Security for Wireless Guest VLAN

Follow these steps to configure security for the Guest VLAN:

1. Type **no access-list 127** and press **Enter**.

```
Router(config)#no access-list 127
```

2. Type **access-list 127 remark Traffic from Guest VLAN** and press **Enter**.

```
Router(config)#access-list 127 remark Traffic from Guest VLAN
```

3. Type **access-list 127 permit ip any host 255.255.255.255** and press **Enter**.

```
Router(config)#access-list 127 permit ip any host 255.255.255.255
```

4. Type **access-list 127 permit udp any any eq bootps** and press **Enter**.

```
Router(config)#access-list 127 permit udp any any eq bootps
```

5. Type **access-list 127 deny ip any 192.168.16.0 0.0.0.255** and press **Enter**.

```
Router(config)#access-list 127 deny ip any 192.168.16.0 0.0.0.255
```

6. Type **access-list 127 permit ip 192.168.17.0 0.0.0.255 any** and press **Enter**.

```
Router(config)#access-list 127 permit ip 192.168.17.0 0.0.0.255 any
```

7. Type **interface bvi 27** and press **Enter**.

```
Router(config)#interface bvi 27
Router(config-if)#
```

8. Type **ip access-group 127 in** and press **Enter**.

```
Router(config-if)#ip access-group 127 in
```

[Back to Top](#)

Configure the Management Switch Port

Follow these steps to configure the management switch port on the router:

1. Type **interface FastEthernet *interface-number*** and press **Enter**. For ***interface-number***, use the number of first available switch port listed in field B36 of the Integrated Services Router Worksheet.

```
Router(config)#interface FastEthernet0/0/1
Router(config-if)#
```

2. Type **description management-port** and press **Enter**.

```
Router(config-if)#description management-port
```

3. Type **switchport access vlan 24** and press **Enter**.

```
Router(config-if)#switchport access vlan 24
```

4. Update the device information in field S5 of the Switch Port Assignments section of the Integrated Services Router Worksheet.

Move Switchports to WLCM VLANs

Once you have created the WLCM VLANs on the router, you need to move switchports into the appropriate VLAN to support your network. Follow these steps to move a switch port to a WLCM VLAN:

1. Review the switch port assignments section of the ISR Router Worksheet to determine which ports you need to reassign.
2. Select the appropriate VLAN for the port that you want to reassign:

- o Lightweight Access Points (LAPs): VLAN 24
- o RADIUS Server: VLAN 24

Note: For more information about the RADIUS server, refer to [Configure the Cisco Wireless LAN Controller Module](#).

- o Default users: VLAN 26
- o Guest users: VLAN 27

3. Complete these steps for each port that you want to reassign:

- a. Type **interface FastEthernet *interface-number*** and press **Enter**. For ***interface-number***, use the number of the switch port that you want to assign to a WLCM VLAN. The available switch ports are listed in field B36 of the Switch Port Assignments section of the Integrated Services Router Worksheet.

```
Router(config)#interface FastEthernet0/2
Router(config-if)#
```

- b. Type **description *device-description*** and press **Enter**. For ***device-description***, enter a brief description of the device.

```
Router(config-if)#Description LAP
```

- c. Type **switchport access vlan *vlan-id*** and press **Enter**. For ***vlan-id***, use appropriate VLAN ID for the switchport.

```
Router(config-if)#switchport access vlan 26
```

- d. Update the device information in fields S15-S52 in the Switch Port Assignments section of the Integrated Services Router Worksheet.
- e. If the device cannot obtain an IP Address automatically, configure the device with an available IP address in the appropriate WLCM VLAN. For example, the first device in the WLCM Default VLAN is configured with the IP address 192.168.16.2. For more information about how to configure an IP address on a PC, refer to [Configure an IP Address on Your PC](#).

Note: Lightweight Access Points (LAPs) obtain an IP address automatically.

4. Type **end** and press **Enter**.

```
Router(config-if)#end
Router#
```

5. Type **write memory** and press **Enter**.

```
Router#write memory
```

[Back to Top](#)

Next Step

You have completed this procedure. To configure the WLAN Controller Module, proceed to [Complete Initial Setup for the Wireless LAN Controller Module](#).

To make further changes to the wireless network, refer to the [Wireless Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I cannot connect to the controller.	<ul style="list-style-type: none"> Ensure that you type https before the controller IP address in your browser. Ensure that your PC is connected to the switch port configured in VLAN 10. For further assistance, contact the SMB Technical Assistance Center (SMB TAC).

Select a Hexadecimal Value for your Controller

In order to allow LAPs to communicate with your WLCM, you need to use a specialized hexadecimal code to provide configuration information to LAPs on the network. Use the table to determine the appropriate hexadecimal value for your controller.

Note: This table assumes that you have only one controller in your network and can use the IP addresses listed in the [Wireless LAN Controller Module IP Addressing Plan](#). If you have more than one controller or need to use an alternative IP address, see [Create a Custom Hexadecimal Value](#) to create a custom hexadecimal value for your controller configuration.

Controller IP Address	Hexadecimal Equivalent
192.168.14.24	f104.c0a8.0e18
192.168.22.24	f104.c0a8.1618
192.168.30.24	f104.c0a8.1e18
192.168.38.24	f104.c0a8.2618
192.168.46.24	f104.c0a8.2e18
192.168.54.24	f104.c0a8.3618
192.168.62.24	f104.c0a8.3e18

192.168.70.24	f104.c0a8.4618
192.168.78.24	f104.c0a8.4e18
192.168.86.24	f104.c0a8.5618
192.168.94.24	f104.c0a8.5e18
192.168.102.24	f104.c0a8.6618
192.168.110.24	f104.c0a8.6e18
192.168.118.24	f104.c0a8.7618
192.168.126.24	f104.c0a8.7e18
192.168.134.24	f104.c0a8.8618
192.168.142.24	f104.c0a8.8e18
192.168.150.24	f104.c0a8.9618
192.168.158.24	f104.c0a8.9e18
192.168.166.24	f104.c0a8.a618
192.168.174.24	f104.c0a8.ae18
192.168.182.24	f104.c0a8.b618
192.168.190.24	f104.c0a8.be18
192.168.198.24	f104.c0a8.c618
192.168.206.24	f104.c0a8.ce18
192.168.214.24	f104.c0a8.d618
192.168.222.24	f104.c0a8.de18
192.168.230.24	f104.c0a8.e618
192.168.238.24	f104.c0a8.ee18
192.168.246.24	f104.c0a8.f618

Create a Custom Hexadecimal Value

If you need to create a custom hexadecimal value for your controller, follow these steps:

Note: Many calculator applications such as Microsoft Calculator have a scientific calculator view that can convert decimal values to hexadecimal.

The custom hexadecimal value consists of three parts:

- **Type:** This value identifies the controller type. Use "f1" as the Type value.
- **Length:** This value indicates the number of controllers in the network. To calculate the length, multiply the number of controllers in your network by 4 and convert this value to hexadecimal. For example, if there is one controller in your network, multiply 1 by 4; the decimal value 4 equals 04 in hexadecimal. If you use two controllers, multiply 2 by 4; the decimal value 8 equals 08 in hexadecimal.

Note: The SMB SA program does not provide support for multiple WLCMs in a single network.

- **Value:** This value indicates the controller management IP address in hexadecimal code. For example, the IP address 192.168.11.24 is equivalent to the hexadecimal address c0a8.0b18.

When you have calculated all three values, combine them into a single address with a decimal place between every four digits. In this example, a single WLAN controller with IP address 192.168.11.24 creates the value f104.c0a8.0b18.

To view more sample values, review the values in [Select a Hexadecimal Value for your Controller](#).

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)
- [Cable Descriptions](#)
- [Wireless LAN Controller Module IP Addressing Plan](#)
- [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)



Set Up Your Wireless LAN Controller Module

Home > Work With My Wireless Devices > Cisco Wireless Devices > Set Up Your Wireless LAN Controller Module

Step 4: Complete Initial Setup for the Cisco Wireless LAN Controller Module

- Step 1: [SMB Support Assistant Site Survey](#)
- Step 2: [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)
- Step 3: [Configure Your Router for the Wireless LAN Controller Module](#)
- Step 4: Complete Initial Setup for the Cisco Wireless LAN Controller Module**
- [Introduction](#)
 - [Requirements](#)
 - [Configure the Controller](#)
 - [Record the WLCM Interface](#)
 - [Connect to the Router](#)
 - [Open a Session to the Wireless LAN Controller Module](#)
 - [Complete the Startup Wizard](#)
 - [Next Step](#)
 - [Troubleshoot the Procedure](#)
 - [Related Information](#)
- Step 5: [Configure the Cisco Wireless LAN Controller Module](#)
- Step 6: [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)
- Step 7: [Add a Lightweight Access Point to Your Wireless Network](#)

Introduction

This document provides instructions to complete initial setup for your Cisco Wireless LAN Controller module (WLCM) installed in your Cisco 2800 and 3800 Integrated Services Router.

This document shows how to configure the WLCM solution with these subnets:

VLAN	IP Address
Wireless LAPs	192.168.14.0

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Download PDF

- [Step 4: Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)
- [Set Up Your Wireless LAN Controller Module](#)

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:

Email:

WLAN Controller Management	192.168.15.0
Wireless Default	192.168.16.0
Wireless Guest	192.168.17.0

If you want to set up a WLCM at more than one site, the [Wireless LAN Controller Module IP Addressing Plan](#) provides additional subnets that you can use for up to 30 sites. To set up an additional site, replace the VLAN subnets used in this document with the appropriate subnets for your site.

[Back to Top](#)

Requirements

To complete the initial setup for the Cisco Wireless LAN Controller, you need these items:

- The Cisco Wireless LAN Controller module installed into the Cisco Integrated Services Router.
- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - ISR Router Worksheet
- You must have completed the procedure in the [Set Up Your Cisco Wireless LAN Controller Module Hardware](#) document.
- You must have completed the initial configuration in the [Configure Your Router with Security Device Manager](#) document.

[Back to Top](#)

Configure the Controller

Follow these steps to complete initial setup configuration for the Cisco Wireless LAN Controller module:

Record the WLCM Interface

In order to connect to the WLCM, you need to verify the WLCM interface number on the router. Follow these steps to verify the WLCM interface number:

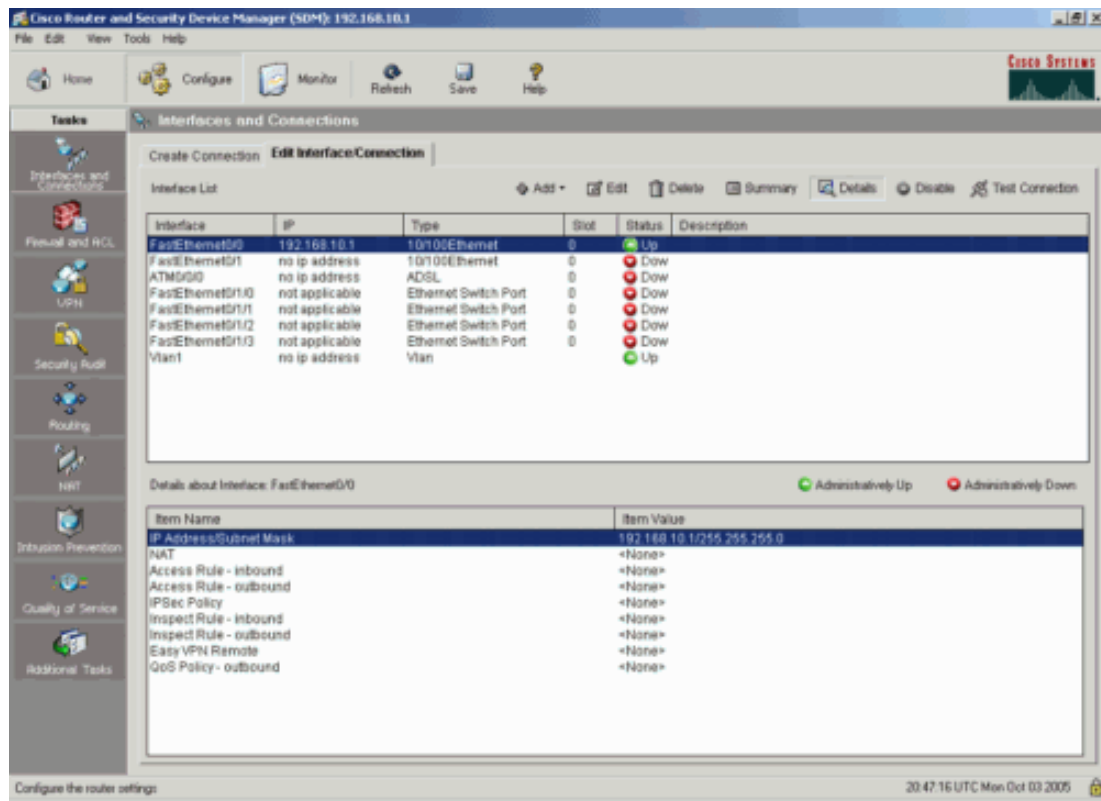
1. Connect to the router with SDM.

To connect to SDM, open a web browser, type **http://router IP address** in the Address field, and press **Enter**. The router's IP address is the IP address that you entered in the LAN Addressing Worksheet (L6A). For more information about how to connect to the router with SDM, refer to [Configure Your Router with Security Device Manager](#).

2. Open a web browser and type **http://router IP address** in the Address field. The router's IP address is the IP address that you entered in the LAN Addressing Worksheet (L6A). Press E
3. Click **Configure**.



4. Click **Interfaces and Connections**.
5. Click **Edit Interface/Connection**.



- Record the wlan-controller interface number in field B39 of the ISR Router worksheet. The interface number indicates the slot and port in which the WLCM is installed.
- Click **File > Exit** to exit SDM.

Connect to the Router

Before you can access the controller module command line interface (CLI), you need to connect to the router. Follow these steps to connect to the router with Telnet:

- Click **Start > Run**.
- In the Run dialog box, type **cmd** or **command**, and then click **OK** to open a command prompt window.
- At the command prompt, type **telnet router-ip-address** and press **Enter**. For **router-ip-address**, use the Router IP address that you entered in field L6A of the LAN Addressing Worksheet.
- Log into the router with the router password that you entered in field B11 of the Integrated Services Router Worksheet. For more information on how to access the router, refer to [Configure Your Router with Security Device Manager](#).

Open a Session to the Wireless LAN Controller Module

Once you connect to the router, you can open a session to the WLCM. Follow these steps to open a session to the controller:

1. Type **enable** and press **Enter** to go to the privileged mode. Type the enable password that you entered in field B12 of the Integrated Services Router Worksheet.

```
Router> enable
Router#
```

```
Router# configure terminal
Router(config)#
```

2. Type **interface wlan-controller *slot/port*** and press **Enter**. For ***slot/port***, use the slot and port number that you recorded in field B39 of the ISR Router worksheet.

```
Router(config)# interface wlan-controller 2/0
```

3. Type **ip address *router-ip-address* 255.255.255.0** and press **Enter**. For ***router-ip-address***, use the Management network IP address that you entered in field L6B of the Management VLAN Worksheet followed by **.1**.

```
Router(config-if)# ip address 192.168.15.1 255.255.255.0
```

4. Type **no shutdown** and press **Enter**.

```
Router(config-if)# no shutdown
```

5. Type **end** and press **Enter**.

```
Router(config-if)#end
Router#
```

6. Type **service-module wlan-controller *slot/port* session** and press **Enter**. For ***slot/port***, use the slot and port number that you recorded in field B39 of the ISR Router worksheet.

```
Router# service-module wlan-controller 2/0 session
```

Complete the Startup Wizard

The first time you connect to the Cisco Wireless LAN Controller with a factory default configuration, a startup wizard appears. Follow these steps to complete the startup wizard on the controller module:

Note: If the Cisco WLAN controller module has no prior configuration, the configuration wizard starts automatically.

1. The Cisco Wizard Configuration Tool prompt appears.

```
Welcome to the Cisco Wizard Configuration Tool
Use the '-' character to backup
```

2. For System Name, type the controller name that you entered in field W16 of the Wireless Worksheet and press **Enter**.

```
System Name {Cisco_33:52:ffffffa0}: NM-WLCM
```

3. For Administrative User Name, type the administrative user name that you entered in field W24 of the Wireless Worksheet and press **Enter**.

```
Enter Administrative User Name (24 characters max): admin
```

4. For Administrative Password, type the administrative password that you entered in field W25 of the Wireless Worksheet and press **Enter**.

```
Enter Administrative Password (24 characters max): * * * * *
```

5. For Management Interface IP address, type **192.168.15.24** and press **Enter**.

```
Management Interface IP Address: 192.168.15.24
```

6. For Management Interface Netmask, type **255.255.255.0** and press **Enter**.

```
Management Interface Netmask: 255.255.255.0
```

7. For Management Interface Default Router, enter **192.168.15.1** and press **Enter**.

```
Management Interface Default Router: 192.168.15.1
```

8. For Management Interface VLAN Identifier, press **Enter** to accept the default setting.

```
Management Interface VLAN Identifier (0 = untagged):
```

9. For Management Interface, press **Enter** to use the default Port Number.

```
Management Interface Port Num [1]:
```

10. For Management Interface DHCP Server IP Address, type **192.168.15.1** and press **Enter**.

Management Interface DHCP Server IP Address: **192.168.15.1**

11. For AP Manager Interface IP Address, type **192.168.15.25** and press **Enter**.

AP Manager Interface IP Address: **192.168.15.25**

12. For the AP Manager Interface DHCP Server, press **Enter** to use the same DHCP server as the Management Interface.

AP Manager Interface DHCP Server (192.168.15.1):

13. For Virtual Gateway IP Address, type **1.1.1.1** and press **Enter**.

Virtual Gateway IP Address: **1.1.1.1**

14. For Mobility/RF Group Name, type **default** and press **Enter**.

Mobility/RF Group Name: **default**

15. For Network Name, type the SSID that you entered in field W26 of the Wireless Worksheet and press **Enter**.

Network Name (SSID): **smb**

16. For Allow Static IP Addresses, type **no** and press **Enter**.

Allow Static IP Addresses [YES][no]:

17. For Configure a RADIUS Server Now, type **no** and press **Enter**. The controller displays a security policy warning.

Warning! The default WLAN security policy requires a RADIUS server.
Please see documentation for details.

Note: Instructions to configure the RADIUS server are provided later in this procedure.

18. Type your country code and press **Enter**.

Enter Country Code (enter 'help' for a list of countries) [US]:

19. Press **Enter** to enable the 802.11b network.

```
Enable 802.11b Network [YES][no]:
```

20. Press **Enter** to enable the 802.11a network.

```
Enable 802.11a Network [YES][no]:
```

21. Press **Enter** to enable the 802.11g network.

```
Enable 802.11g Network [YES][no]:
```

22. Press **Enter** to enable Auto-RF.

```
Enable Auto-RF [YES][no]:
```

23. For Configure a NTP Server Now, type **no** and press **Enter**.

Note: Instructions to configure the NTP server are provided later in this procedure.

```
Configure a NTP server now? [YES][no]: no
```

24. Press **Enter** to configure the system time.

```
Configure the system time now? [YES][no]:
```

25. Enter the month, date and year in the specified format.

```
Enter the date in MM/DD/YY format: 10/05/06
```

26. Type the time in the specified format and press **Enter**.

```
Enter the time in HH:MM:SS format: 19:06:50
```

27. At the Configuration Correct prompt, type **Yes** and press **Enter** to save the configuration .

```
Configuration correct? If yes, system will save it and reset. [yes][NO]: yes
```

```
Configuration saved!
```

```
Resetting system with new configuration... Configuration saved!
```

28. The WLCM boots with the new configuration.

```

Initializing memory. Please wait. 256 MB SDRAM detected
BIOS Version: SM 02.00
BIOS Build date: 09/17/02
System Now Booting ...

```

```

Booting from disk..., please wait.

```

```

Cisco Bootloader Loading stage2...

```

```

Cisco Bootloader (Version 3.2.116.21)

```

```

.o88b. d8888888b .d8888. .o88b. .d88b.
d8P Y8 `88' 88' YP d8P Y8 .8P Y8.
8P      88  `8bo. 8P      88  88
8b      88  `Y8b. 8b      88  88
Y8b d8 .88. db 8D Y8b d8 `8b d8'
`Y88P' Y888888P `8888Y' `Y88P' `Y88P'

```

```

Booting Primary Image...

```

Note: If you want to return to the router CLI, press **Control + Shift + 6**, followed by **x**.

[Back to Top](#)

Next Step

You have completed this procedure. To configure the controller module, proceed to [Configure the Cisco Wireless LAN Controller](#).

To make further changes to your wireless network, refer to the [Wireless Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I cannot connect to the Router through Telnet.	Refer to Configure Your Router to Support SDM and check whether telnet access is configured properly.
I cannot connect to the Controller module.	Make sure you type the correct slot and port number when you connect to the Controller module installed into the Router with the service-module wlan-controller slot/port session command.
I cannot exit the WLCM session.	Press Control + Shift + 6 , followed by x to return to the router CLI.

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)



Set Up Your Wireless LAN Controller Module

[Home](#) > [Work With My Wireless Devices](#) > [Cisco Wireless Devices](#) > [Set Up Your Wireless LAN Controller Module](#)

Step 5: Configure the Cisco Wireless LAN Controller Module

- Step 1: [SMB Support Assistant Site Survey](#)
 Step 2: [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)
 Step 3: [Configure Your Router for the Wireless LAN Controller Module](#)
 Step 4: [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)

Step 5: Configure the Cisco Wireless LAN Controller Module

[Introduction](#)

[Requirements](#)

[Configure the Controller](#)

[Connect to the Device Manager](#)

[Switch Settings](#)

[Configure Interfaces](#)

[WLAN Settings](#)

[Wireless Security](#)

[Configure WLAN Security for a Pre-Shared Key](#)

[Configure Wireless Security for an External RADIUS Server](#)

[Next Step](#)

[Troubleshoot the Procedure](#)

[Install the Certificate](#)

[Related Information](#)

- Step 6: [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)
 Step 7: [Add a Lightweight Access Point to Your Wireless Network](#)

Introduction

This document provides instructions on how to configure the Wireless LAN Controller Module (WLCM) installed in your Cisco 2800 and 3800 Integrated Services Router.

This document shows how to configure the WLCM solution with these subnets:

VLAN	IP Address
Wireless LAPs	192.168.14.0

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:

Email:

Download PDF

- [Step 5: Configure the Cisco Wireless LAN Controller Module](#)
- [Set Up Your Wireless LAN Controller Module](#)

WLAN Controller Management	192.168.15.0
Wireless Default	192.168.16.0
Wireless Guest	192.168.17.0

If you want to set up a WLCM at more than one site, the [Wireless LAN Controller Module IP Addressing Plan](#) provides additional subnets that you can use for up to 30 sites. To set up an additional site, replace the VLAN subnets used in this document with the appropriate subnets for your site.

[Back to Top](#)

Requirements

To configure the Cisco WLCM, you need these items:

- A straight-through Ethernet cable. For more information about cables, refer to [Cable Descriptions](#).
- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - ISR Router Worksheet

In addition, you must have completed the steps in the [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#) document.

[Back to Top](#)

Configure the Controller

Follow these steps to configure the Cisco WLCM:

Connect to the Device Manager

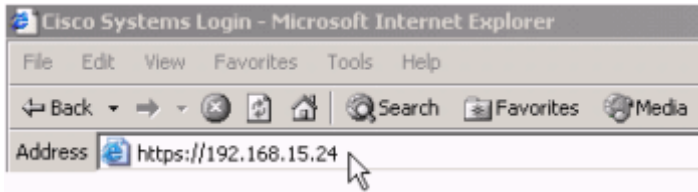
Follow these steps to connect to the Cisco WLAN Controller web user interface:

1. Connect a [straight-through Ethernet cable](#) from a PC to the Management port listed in field S5 of the ISR Router Worksheet.
2. Configure your PC with these values:
 - IP Address: **192.168.14.100**

- Subnet Mask: **255.255.255.0**
- Default Gateway: **192.168.14.1**

For detailed instructions on how to configure an IP address on your PC, refer to [Configure an IP Address on Your PC](#).

3. In a web browser, open **https://192.168.15.24**.

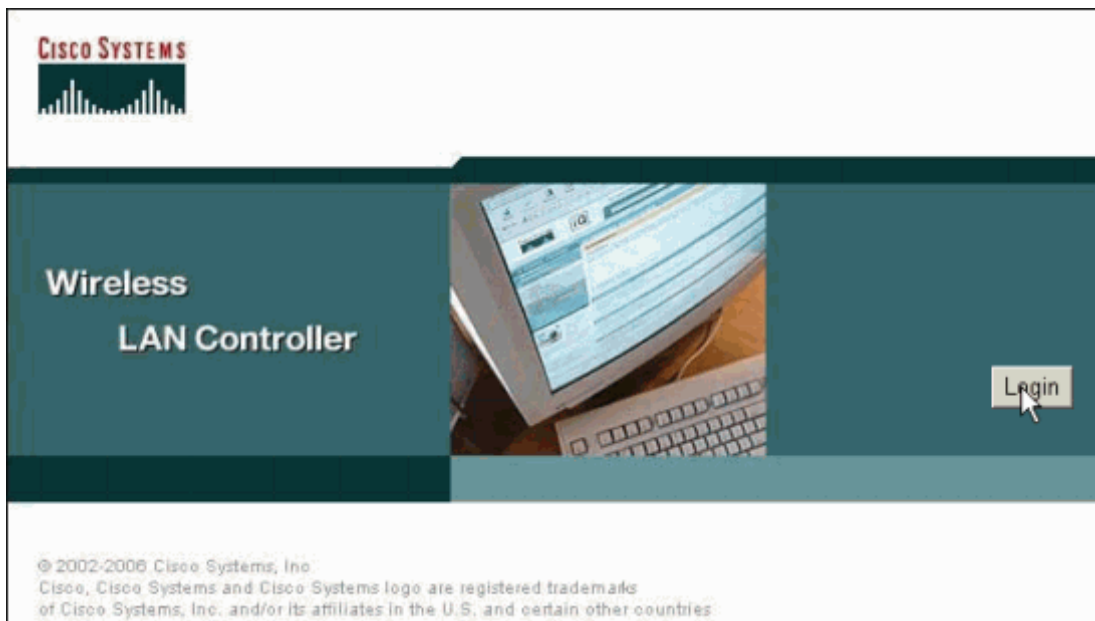


4. Click **Yes** to accept the security certificate from the WLCM.



Note: If you would like to permanently install the certificate in order to skip this step in the future, see [Install the Certificate](#).

5. Click **Login**.



6. In the Enter Network Password dialog box, enter the username **admin** and the password that you entered in fields W24 of the ISR Router Worksheet.



7. The WLCM Monitor screen displays.

Cisco Systems | Save Configuration | Ping | Logout | Refresh

MONITOR | WLANs | CONTROLLER | WIRELESS | SECURITY | MANAGEMENT | COMMANDS | HELP

Monitor

Summary

Statistics

Controller

Ports

Wireless

Rogue APs

Known Rogue APs

Rogue Clients

Adhoc Rogues

802.11a Radios

802.11b/g Radios

Clients

RADIUS Servers

Summary

Controller Summary

Management IP Address: 192.168.10.252

Software Version: 3.2.78.0

System Name: Cisco_33-52-4444a0

Up Time: 0 days, 1 hours, 1 minutes

System Time: Thu Feb 9 05:48:19 2006

802.11a Network State: Enabled

802.11b/g Network State: Enabled

Rogue Summary

Active Rogue APs: 0 [Detail](#)

Active Rogue Clients: 0 [Detail](#)

Adhoc Rogues: 0 [Detail](#)

Rogues on Wired Network: 0

Top WLANs

WLAN	# of Clients by SSID	Detail
smbsa	0	Detail

Most Recent Traps

Cold Start:

Link Up: Slot: 0 Part: 4

Link Down: Slot: 0 Part: 4

[View All](#)

This page refreshes every 30 seconds.

Access Point Summary

	Total	Up	Down	Detail
802.11a Radios	0	0	0	Detail
802.11b/g Radios	0	0	0	Detail
All APs	0	0	0	Detail

Client Summary

Current Clients	0	Detail
Excluded Clients	0	Detail
Disabled Clients	0	Detail

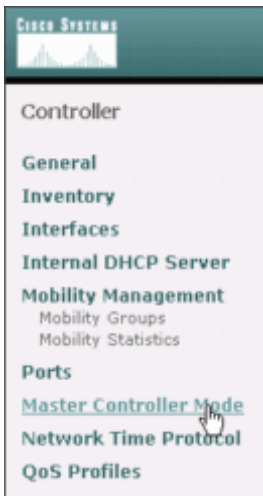
Switch Settings

Follow these steps to configure the switch settings on the Wireless Controller:

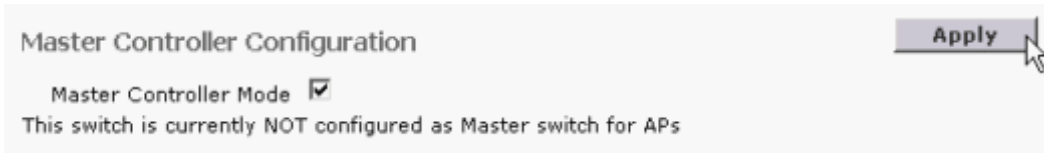
1. Click **Controller**.



2. Follow these steps to set the WLCM in master controller mode:
 - a. Click **Master Controller Mode**.



- b. Check **Master Controller Mode** and click **Apply**.



- 3. Follow these steps to configure a time server:

- a. Click **Network Time Protocol**.



- b. Click **New**.



NTP Servers

Apply New...

NTP Polling Interval seconds 86400

Server Index	Server Address
--------------	----------------

c. On the NTP Servers > New screen, enter these values:

- Server Index (Priority): 1
- Server IP Address: Enter the router IP address that you entered in field L6A of the LAN Addressing Worksheet.

Click **Apply**.



NTP Servers > New

< Back Apply

Server Index (Priority) 1

Server IPAddress 192.168.10.1

Configure Interfaces

Follow these steps to configure VLAN interfaces on the WLCM:

1. Click **Controller**.



2. Click **Interfaces**.



3. Follow these steps to create a VLAN interface for wireless users on the default network:

a. Click **New**.



b. Enter these values to create the Guest VLAN interface:

- Interface Name: Vlan26
- VLAN ID: **26**

Click **Apply**.



c. On the Interfaces > Edit screen, make these changes to the default values:

- Interface Address:
 - IP Address: **192.168.16.254**
 - Netmask: **255.255.255.0**
 - Gateway: **192.168.16.1**

- DHCP Information:
 - Primary DHCP Server: **192.168.16.1**

Click **Apply**.

The screenshot shows the Cisco configuration interface for editing a VLAN interface. The navigation bar at the top includes: MONITOR, WLANs, CONTROLLER (highlighted), WIRELESS, SECURITY, MANAGEMENT, COMMANDS, and HELP. The breadcrumb trail is "Interfaces > Edit". There are "< Back" and "Apply" buttons. The configuration is organized into sections:

- General Information:** Interface Name: Vlan26
- Interface Address:** VLAN Identifier: 26, IP Address: 192.168.16.254, Netmask: 255.255.255.0, Gateway: 192.168.16.1
- Physical Information:** Port Number: 1
- DHCP Information:** Primary DHCP Server: 192.168.16.1, Secondary DHCP Server: 0.0.0.0
- Access Control List:** ACL Name: none

A red note at the bottom states: "Note: Changing the Interface parameters causes the WLANs to be temporarily disabled and thus may result in loss of connectivity for some clients."

4. Follow these steps to create a VLAN interface for wireless users on the guest network:

- a. Click **New**.
- b. Enter these values to create the Guest VLAN interface:
 - Interface Name: Vlan27
 - VLAN ID: **27**

Click **Apply**.

- c. Click **Interfaces > Edit**.
- d. On the Interfaces > Edit screen, make these changes to the default values:
 - Interface Address:
 - IP Address: **192.168.17.254**

- Netmask: **255.255.255.0**
- Gateway: **192.168.17.1**
- DHCP Information:
 - Primary DHCP Server: **192.168.17.1**

Click **Apply**.

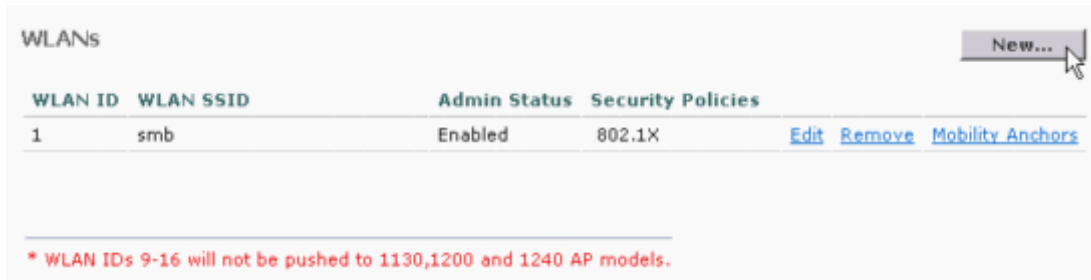
WLAN Settings

Follow these steps to configure Wireless LAN interfaces (WLANs) on the WLCM:

1. Click **WLANs**.



2. Click **New**.



3. Enter these values to create a WLAN for guest users:

- WLAN ID: **3**
- WLAN SSID: **wlan3**

Click **Apply**.



4. On the WLANs > Edit screen, make these changes to the default values:

- General Policies:
 - Admin Status: **Enabled**
 - DHCP Server: Check **Override** and enter **192.168.17.1**.
 - DHCP Addr. Assignment: **Required**
 - Interface Name: **Vlan 27**
- Security Policies:
 - Layer 2 Security: **None**
 - Layer 3 Security: **None**

Note: Instructions to apply security policies are provided later in this document.

Click **Apply**.

The screenshot shows the Cisco WLAN configuration interface. The top navigation bar includes: MONITOR, WLANs, CONTROLLER, WIRELESS, SECURITY, MANAGEMENT, COMMANDS, HELP. The main heading is "WLANs > Edit" with "< Back" and "Apply" buttons.

WLAN ID: 3
WLAN SSID: wlan3

General Policies

- Radio Policy: All
- Admin Status: Enabled
- Session Timeout (secs): 1800
- Quality of Service (QoS): Silver (best effort)
- WMM Policy: Disabled
- 7920 Phone Support: Client CAC Limit AP CAC Limit
- Broadcast SSID: Enabled
- Allow AAA Override: Enabled
- External Policy Validation: Enabled
- Client Exclusion: Enabled ** 60
 Timeout Value (secs)
- DHCP Server: Override 192.168.17.1
 DHCP Server IP Addr
- DHCP Addr. Assignment: Required
- Interface Name: vlan27

Security Policies

- Layer 2 Security: None
 MAC Filtering
- Layer 3 Security: None
 Web Policy *

Radius Servers

	Authentication Servers	Accounting Servers
Server 1	none	none
Server 2	none	none
Server 3	none	none

*** Web Policy cannot be used in combination with IPsec and L2TP.**

**** When client exclusion is enabled, a timeout value of zero means infinity (will require administrative override to reset excluded clients)**

Wireless Security

Two security options are available for the WLCM:

- External RADIUS Server: The wireless network uses an external RADIUS server to authenticate users. This option provides greater security and requires that you provide an external RADIUS server.

Note: Cisco provides the parameters required to set up the RADIUS server, but does not provide full instructions for any particular RADIUS implementation.

- WPA2 Pre-Shared Key: A pre-shared password or passphrase is used to provide access to the wireless network. This option is less secure and requires that you create a [strong password](#) for the wireless network.

To configure wireless security to use a pre-shared key, proceed to [Configure Wireless Security for a Pre-Shared Key](#). To configure wireless security to use an external RADIUS server, proceed to [Configure Wireless Security for an External RADIUS Server](#).

Configure WLAN Security for a Pre-Shared Key

Follow these steps to configure wireless security to use a WPA2 Pre-Shared Key:

1. Click **WLANs**.



2. Follow these steps to configure security on the default WLAN:

- a. Click **Edit** next to the WLAN SSID for the default network that you entered in field W26 of the ISR Router Worksheet.

 A screenshot of the WLANs configuration page. The navigation menu at the top includes MONITOR, WLANs, CONTROLLER, WIRELESS, SECURITY, MANAGEMENT, COMMANDS, and HELP. The 'WLANs' menu item is highlighted. Below the menu is a 'New...' button. The main content area contains a table with the following data:

WLAN ID	WLAN SSID	Admin Status	Security Policies	
1	smb	Enabled	802.1X	Edit Remove Mobility Anchors
3	wlan3	Enabled		Edit Remove Mobility Anchors

* WLAN IDs 9-16 will not be pushed to 1130,1200 and 1240 AP models.

- b. On the WLANs > Edit screen, make these changes to the default values:

- a. Security Policies:

- Layer 2 Security: Choose **WPA2**.
- Layer 3 Security: **None**.

b. WPA2 Parameters:

- WPA2 Compatibility Mode: Check **WPA2 Compatibility Mode**.
- Allow WPA2 TKIP Clients: **Check Allow WPA2 TKIP Clients**.
- Pre-Shared Key: **Check Pre-Shared Key**.
- Check **Please set the WPA2 Pre-Shared Key of length between 8 and 63 characters** and enter the Pre-Shared Key taht you entered in field W27 of the ISR Router Worksheet.

Click **Apply**.

The screenshot shows the Cisco WLAN configuration interface. The top navigation bar includes MONITOR, WLANs, CONTROLLER, WIRELESS, SECURITY, MANAGEMENT, COMMANDS, and HELP. The main content area is titled 'WLANs > Edit' and shows configuration for WLAN ID 1 with SSID 'smb'. The 'General Policies' section includes settings for Radio Policy (All), Admin Status (Enabled), Session Timeout (1800), Quality of Service (Silver), WMM Policy (Disabled), 7920 Phone Support, Broadcast SSID (Enabled), Allow AAA Override, External Policy Validation, Client Exclusion (Enabled with 60s timeout), DHCP Server (Override at 192.168.16.1), DHCP Addr. Assignment (Required), and Interface Name (vlan26). The 'Security Policies' section shows Layer 2 Security (WPA2) and Layer 3 Security (None). The 'Radius Servers' section shows three servers with 'none' selected for both authentication and accounting. The 'WPA2 Parameters' section at the bottom has 'WPA Compatibility Mode' (Enabled), 'Allow WPA2 TKIP Clients' (Enabled), and 'Pre-Shared Key' (Enabled with a note to set a key of length 8-63 characters).

MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP

WLANs > Edit < Back Apply

WLAN ID 1
WLAN SSID smb

General Policies

Radio Policy All
Admin Status Enabled
Session Timeout (secs) 1800
Quality of Service (QoS) Silver (best effort)
WMM Policy Disabled
7920 Phone Support Client CAC Limit AP CAC Limit
Broadcast SSID Enabled
Allow AAA Override Enabled
External Policy Validation Enabled
Client Exclusion Enabled ** 60
Timeout Value (secs)
DHCP Server Override 192.168.16.1
DHCP Server IP Addr
DHCP Addr. Assignment Required
Interface Name vlan26

Security Policies

Layer 2 Security WPA2
 MAC Filtering

Layer 3 Security None
 Web Policy *

* Web Policy cannot be used in combination with IPsec and L2TP.
** When client exclusion is enabled, a timeout value of zero means infinity(will require administrative override to reset excluded clients)

Radius Servers

	Authentication Servers	Accounting Servers
Server 1	none	none
Server 2	none	none
Server 3	none	none

WPA2 Parameters

WPA Compatibility Mode Enable
Allow WPA2 TKIP Clients Enable
Pre-Shared Key Enabled (WPA2 passphrase has been set)
 Please set the WPA2 Pre-Shared Key of length between 8 and 63 characters

3. Follow these steps to configure security on the Guest WLAN:

- a. Click **Edit** next to **wlan3**.

b. On the WLANs > Edit screen, make these changes to the default values:

a. Security Policies:

- Layer 2 Security: Choose **WPA2**.
- Layer 3 Security: **None**.

b. WPA2 Parameters:

- WPA2 Compatibility Mode: Check **WPA2 Compatibility Mode**.
- Allow WPA2 TKIP Clients: **Check Allow WPA2 TKIP Clients**.
- Pre-Shared Key: **Check Pre-Shared Key**.
- Check **Please set the WPA2 Pre-Shared Key of length between 8 and 63 characters** and enter the Pre-Shared Key that you entered in field W27 of the ISR Router Worksheet.

Click **Apply**.

4. Click **Save Configuration** to save your configuration. Click **OK** to confirm.



5. Proceed to the [Next Step](#).

Configure Wireless Security for an External RADIUS Server

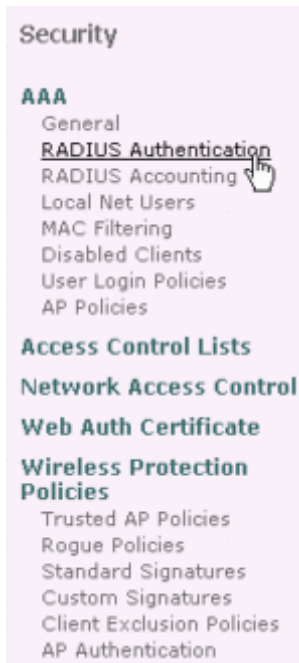
Follow these steps to configure wireless security with an external RADIUS server:

1. Follow these steps to configure the WLCM to use the RADIUS server:

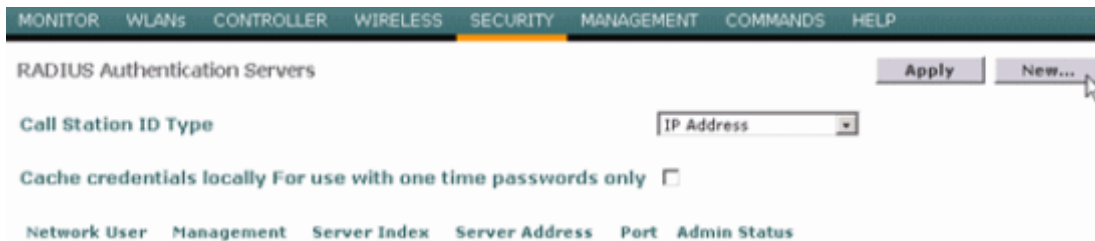
a. Click **Security**.



b. Click **Radius Authentication**.



c. Click **New**.



d. On the RADIUS Authentication Servers > New screen, make these changes to the default values:

- Server IP Address: Enter the IP address of the RADIUS server that you entered in the field W22 of the Wireless Worksheet.
- Shared Secret: Enter the shared secret key that you entered in field W18 of the Wireless Worksheet.
- Confirm Shared Secret: Re-enter the shared secret key that you entered in field W18 of the Wireless Worksheet.
- Network User: **Enable**

Click **Apply**.

MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP

RADIUS Authentication Servers > New [< Back](#) [Apply](#)

Server Index (Priority)

Server IP Address

Shared Secret Format

Shared Secret

Confirm Shared Secret

Port Number

Server Status

Support for RFC 3576

Retransmit Timeout seconds

Network User Enable

Management Enable

2. Follow these steps to configure WLAN security for the RADIUS server:

a. Click **WLANs**.



b. Follow these steps to configure WLAN security for users on the default network:

a. Click **Edit** next to the WLAN SSID for the default network that you entered in field W26 of the ISR Router Worksheet.

MONITOR WLANs CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP

WLANs [New...](#)

WLAN ID	WLAN SSID	Admin Status	Security Policies	
1	smb	Enabled	802.1X	Edit Remove Mobility Anchors
3	wlan3	Enabled		Edit Remove Mobility Anchors

* WLAN IDs 9-16 will not be pushed to 1130,1200 and 1240 AP models.

b. On the WLANs > Edit screen, make these changes to the default values:

a. Security Policies:

- Layer 2 Security: Choose **WPA2**.
- Layer 3 Security: **None**.

b. RADIUS servers:

- Server 1: Choose the RADIUS server IP Address that you entered in field W22 of the ISR Router Worksheet.

Click **Apply**.

MONITOR **WLANs** CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP

WLANs > Edit < Back Apply

WLAN ID: 1
WLAN SSID: smb

General Policies

Radio Policy: All
Admin Status: Enabled
Session Timeout (secs): 1800
Quality of Service (QoS): Silver (best effort)
WMM Policy: Disabled
7920 Phone Support: Client CAC Limit AP CAC Limit
Broadcast SSID: Enabled
Allow AAA Override: Enabled
External Policy Validation: Enabled
Client Exclusion: Enabled ** 60
DHCP Server: Override 192.168.16.1
DHCP Addr. Assignment: Required
Interface Name: vlan26

Security Policies

Layer 2 Security: WPA2
 MAC Filtering

Layer 3 Security: None
 Web Policy *

* Web Policy cannot be used in combination with IPsec and L2TP.
** When client exclusion is enabled, a timeout value of zero means infinity(will require administrative override to reset excluded clients)

Radius Servers

	Authentication Servers	Accounting Servers
Server 1	IP:192.168.14.5, Port:1812	none
Server 2	none	none
Server 3	none	none

WPA2 Parameters

WPA Compatibility Mode: Enable
Allow WPA2 TKIP Clients: Enable
Pre-Shared Key: Enabled (WPA2 passphrase has been set)

c. Follow these steps to configure WLAN security for Guest users:

a. Click **Edit** next to **wlan3**.

b. On the WLANs > Edit screen, make these changes to the default values:

a. Security Policies:

- Layer 2 Security: Choose **WPA2**.
- Layer 3 Security: **None**.

b. RADIUS servers:

- Server 1: Choose the RADIUS server IP Address that you entered in field W22 of the ISR Router Worksheet.

Click **Apply**.

d. Click **Save Configuration** to save your configuration. Click **OK** to confirm.



[Back to Top](#)

Next Step

You have completed this procedure.

If you set up wireless security for a pre-shared key, proceed to [Add a Lightweight Access Point to Your Wireless Network](#).

If you set up wireless security for an external RADIUS server, proceed to [Set Up a RADIUS Server for the Wireless LAN Controller Module](#).

To make further changes to the wireless network, refer to the [Wireless Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)

I cannot connect to the WLCM.

- Ensure that you type **https** before the WLCM IP address in your browser.
- Ensure that your PC is connected to the management port that you configured in [Configure Your Router for the Wireless LAN Controller Module](#).
- For further assistance, contact the [SMB Technical Assistance Center \(SMB TAC\)](#).

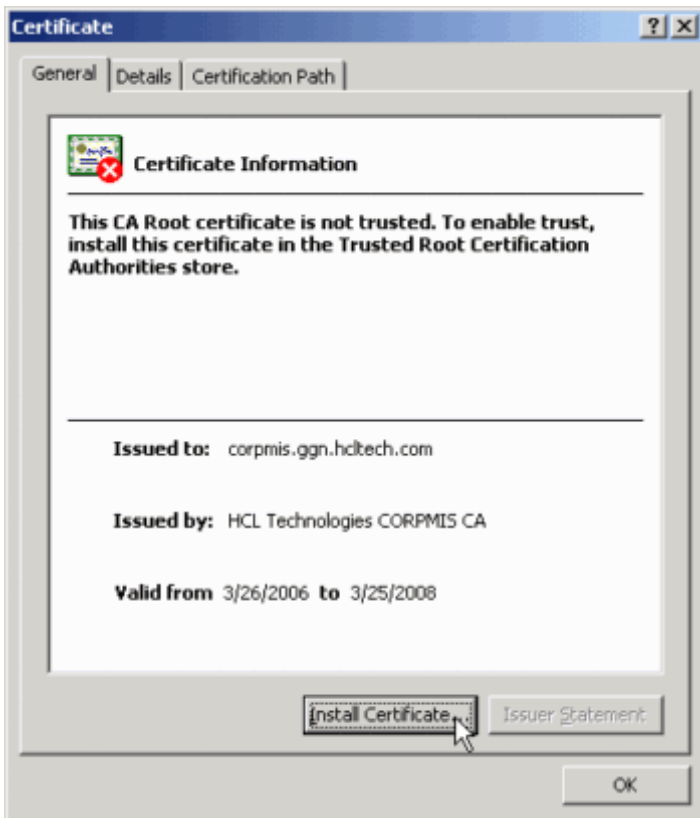
Install the Certificate

If you want to install a certificate from the WLCM on your PC, follow these steps:

1. Click **View Certificate**.



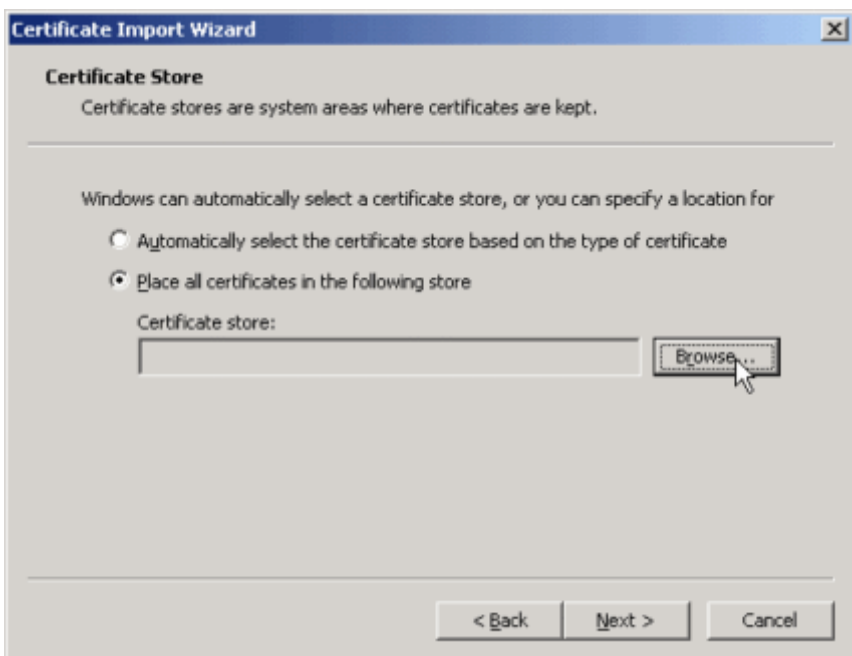
2. On the Certificate screen, click **Install Certificate**.



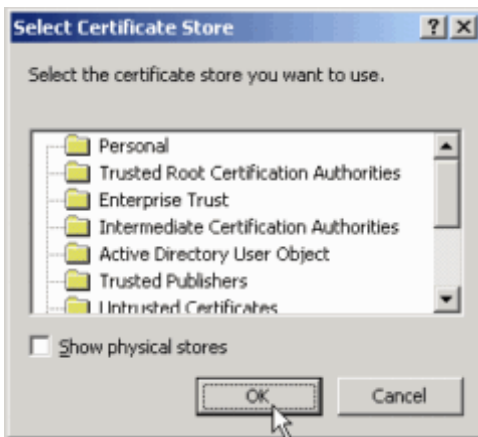
3. On the Certificate Import Wizard screen, click **Next**.



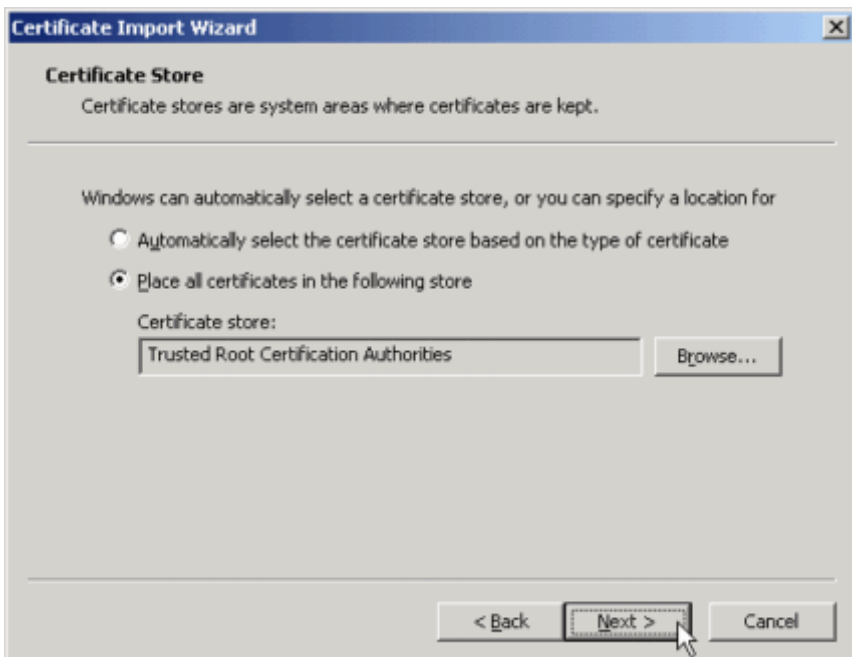
4. On the Certificate Store screen, choose **Place all certificates in the following store** and click **Browse**.



5. On the Select Certificate Store screen, click **Trusted Root Certificate Authorities** and click **OK**.



6. The Certificate Store screen displays **Trusted Root Certification Authorities**. Click **Next**.



7. Click **Finish**.



8. The browser displays a security warning. Click **OK**.
9. The browser displays an alert that indicates that the certificate import was successful. Click **OK**.

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)
- [Cable Descriptions](#)
- [Add a Lightweight Access Point to Your Wireless Network](#)
- [Wireless LAN Controller Module IP Addressing Plan](#)
- [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)



Set Up Your Wireless LAN Controller Module

[Home](#) > [Work With My Wireless Devices](#) > [Cisco Wireless Devices](#) > Set Up Your Wireless LAN Controller Module

Step 6: Set Up a RADIUS Server for the Wireless LAN Controller Module

- Step 1: [SMB Support Assistant Site Survey](#)
- Step 2: [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)
- Step 3: [Configure Your Router for the Wireless LAN Controller Module](#)
- Step 4: [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)
- Step 5: [Configure the Cisco Wireless LAN Controller Module](#)

Step 6: Set Up a RADIUS Server for the Wireless LAN Controller Module

[Introduction](#)

[Requirements](#)

[Set Up a RADIUS Server](#)

[Wireless Security Standards](#)

[VLAN Requirements](#)

[RADIUS Server Properties](#)

[Manage Wireless Users](#)

[Next Step](#)

[Troubleshoot the Procedure](#)

[Related Information](#)

- Step 7: [Add a Lightweight Access Point to Your Wireless Network](#)

Introduction

This document provides instructions on how to set up a RADIUS server to support the Wireless LAN Controller Module (WLCM).

Note: If you configured wireless security for a WPA2 pre-shared key, proceed to [Add a Lightweight Access Point to Your Wireless Network](#).

This document shows how to configure the WLCM solution with these subnets:

VLAN	IP Address
Wireless LAPs	192.168.14.0
WLAN Controller Management	192.168.15.0
Wireless Default	192.168.16.0
Wireless Guest	192.168.17.0

If you want to set up a WLCM at more than one site, the [Wireless LAN Controller Module IP Addressing Plan](#) provides additional subnets that you can use for up to 30 sites. To set up an additional site, replace the VLAN subnets used in this document with the appropriate subnets for your site.

[Back to Top](#)

Requirements

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:

Email:

Download PDF

- [Step 6: Set Up a RADIUS Server for the Wireless LAN Controller Module Set Up Your Wireless LAN Controller Module](#)
- [Step 6: Set Up a RADIUS Server for the Wireless LAN Controller Module Set Up Your Wireless LAN Controller Module](#)

To configure your router to support the WLCM, you need these items:

- An external RADIUS server that supports LEAP authentication.
- Completed worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - ISR Router Worksheet
- You must have completed the steps in the [Configure the Cisco Wireless LAN Controller Module](#) document.

[Back to Top](#)

Set Up a RADIUS Server

The Cisco Wireless LAN Controller Module (WLCM) allows you to set up an external RADIUS server on your network to authenticate users. A variety of options and applications are available to support a RADIUS server. For complete instructions for your server type, refer to the documentation for your RADIUS server.

Follow these steps to set up a RADIUS server for the Wireless LAN Controller Module (WLCM):

Wireless Security Standards

The configuration provided for the WLCM uses WPA2 security, which is a combination of 802.1x and EAP authentication, and AES-CCMP encryption. Since the RADIUS server is responsible only for the client authentication exchange, the only security required for the RADIUS server is EAP authentication. The WLCM configuration provided here uses the LEAP implementation of EAP.

VLAN Requirements

Before you configure the RADIUS server, ensure that the router switchport attached to the RADIUS server is in the same VLAN as the LAPs in your wireless network. For further instructions, refer to [Configure Your Router for the Wireless LAN Controller Module](#).

RADIUS Server Properties

To communicate with the WLCM, you need to configure your RADIUS server with the values to match the WLCM and router. For more information about how to configure these values, refer to the documentation for your RADIUS server.

Set up your RADIUS server with these values:

- IP Address: Assign the RADIUS server an available IP address in VLAN 24.
- Default gateway: 192.168.14.1
- Subnet mask: 255.255.255.0
- Client Hostname: Enter the WLCM name that you entered in the field W16 of the Integrated Services Router Worksheet.
- Client IP Address: 192.168.15.24
- Key: Enter the RADIUS key that you entered in the field W28 of the Integrated Services Router Worksheet.
- Authentication type: LEAP

Manage Wireless Users

Once you have configured these values, use your RADIUS server to add, remove, or change user profiles for the wireless network.

[Back to Top](#)

Next Step

You have completed this procedure. To add a Lightweight Access Point (LAP) to your wireless network, refer to [Add a Lightweight Access Point to Your Wireless Network](#)

To make further changes to the wireless network, refer to the [Wireless Support Page](#).

To configure other devices in your network, refer to the [Configuration Overview Page](#).

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
I am unable to configure the RADIUS server with the values indicated.	<ul style="list-style-type: none">• Refer to the documentation for your RADIUS server.• Contact the SMB Technical Assistance Center (SMB TAC) for assistance.

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Cable Descriptions](#)
- [Wireless LAN Controller Module IP Addressing Plan](#)
- [Configure the Cisco Wireless LAN Controller Module](#)



Set Up Your Wireless LAN Controller Module

[Home](#) > [Work With My Wireless Devices](#) > [Cisco Wireless Devices](#) > Set Up Your Wireless LAN Controller Module

Service Requests

[Open a service request](#)

[Update a service request](#)

Feedback

Please rate this document.

++ + +/- - --

This document solved my problem.

Yes No Just Browsing

Suggestions for improvement:

If Cisco may contact you for more details or for future feedback opportunities, please enter your contact information:

Full Name:

Email:

Step 7: Add a Lightweight Access Point to Your Wireless Network

Step 1: [SMB Support Assistant Site Survey](#)

Step 2: [Set Up Your Cisco Wireless LAN Controller Module Hardware](#)

Step 3: [Configure Your Router for the Wireless LAN Controller Module](#)

Step 4: [Complete Initial Setup for the Cisco Wireless LAN Controller Module](#)

Step 5: [Configure the Cisco Wireless LAN Controller Module](#)

Step 6: [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)

Step 7: Add a Lightweight Access Point to Your Wireless Network

[Introduction](#)

[Requirements](#)

[Set Up the Lightweight Access Point](#)

[Connect the LAP to the Router](#)

[The LAP Associates to the Wireless LAN Controller Module](#)

[Install the Lightweight Access Point](#)

[Move the LAP to the Mount Location](#)

[Mount the LAP](#)

[Reconnect the LAP](#)

[Next Step](#)

[Troubleshoot the Procedure](#)

[Related Information](#)

Download PDF

[Step 7: Add a Lightweight Access Point to Your Wireless Network](#)

[Set Up Your Wireless LAN Controller Module](#)

Introduction

This document provides instructions to set up a new Lightweight Access Point (LAP) on your wireless network.

[Back to Top](#)

Requirements

To perform the steps described in this document, you need to have these items:

- A Cisco Integrated Services Router (ISR) with a Wireless LAN Controller Module (WLCM) and at least one available switch port
- An 1130 or 1240 series Lightweight Access Point (LAP)
- To power the LAP with an external power supply, you need these items:
 - 48 VDC power supply (ordered separately from the LAP)
 - Two straight-through Ethernet cables
- To power the LAP with Power over Ethernet (PoE), you need these items:
 - 802.3af-compatible PoE device such as a PoE-enabled switch module or power injector
 - Two straight-through Ethernet cables

Note: For more information about PoE, refer to the PoE description in the documentation included with your LAP.

- Completed worksheets from the Site Survey:

- Integrated Services Router Worksheet
- You must have completed the steps in [Set Up a RADIUS Server for the Wireless LAN Controller Module](#).
- You must have read the Regulatory Compliance and Safety Information included with your LAP.
- You must have reviewed your site to determine the mounting location of your LAP.

[Back to Top](#)

Set Up the Lightweight Access Point

Follow these steps to configure the Lightweight Access Point (LAP):

Connect the LAP to the Router

Follow these steps to connect the LAP to the router:

1. Review the switch port assignments section of the Integrated Services Router worksheet to locate an available switch port. Assign a switch port to the LAP and update the switch port assignments.
2. Follow these steps to power the LAP:
 - If you want to use Power over Ethernet (PoE) to power the LAP, connect the LAP to the router via a PoE-enabled switch module or an 802.3af-compatible PoE device such as a power injector. Use two [straight-through Ethernet cables](#) to make the connection.
 - If you want to use a 48 VDC power supply to power the LAP, connect the LAP to the appropriate switch port with a [straight-through Ethernet cable](#). Then connect the 48 VDC External Power Supply into the back of the LAP, and connect the other end to a grounded 100 to 240 VAC 50/60 Hz electrical outlet.

Note: For more information about Power over Ethernet (PoE), refer to the documentation included with your PoE device.

3. The LAP boots when power is applied.

The LAP Associates to the Wireless LAN Controller Module

When power is applied to the LAP, it attempts to associate to the Wireless LAN Controller Module (WLCM). Monitor the LAP to ensure that it completes these steps:

1. The LAP displays these status LED combinations during boot:

Ethernet LED	Radio LED	Status LED	Meaning
Green	Green	Green	DRAM Memory Test OK
Off	Blinking green	Blue-green	Initialize Flash filesystem
Off	Green	Pink	Flash memory test OK
Green	Off	Dark Blue	Ethernet test OK
Green	Green	Green	Start Cisco IOS

2. The LAP displays these status LED combinations when it attempts to associate to the WLCM:

Ethernet LED	Radio LED	Status LED	Meaning
--------------	-----------	------------	---------

		Alternating green, red, and amber	Connecting to the controller. Note: If the LAP does not associate to the controller after 5 minutes, see Troubleshoot the Procedure .
		Blinking dark blue	Loading the access point image file.

Note: If the controller has a newer version of operating system code, the LAP downloads the new code from the controller, reboots, and attempts to associate with the controller again.

3. The LAP displays these status LED combinations when it has associated to the controller:

Ethernet LED	Radio LED	Status LED	Meaning
		Light green	Normal operating condition, but no wireless client devices are associated with the unit.
		Blue	Normal operating condition, at least one wireless client device is associated with the LAP.

Note: For a complete listing of all LED patterns for the LAP, refer to the hardware documentation included with your LAP.

[Back to Top](#)

Install the Lightweight Access Point

Once the LAP has successfully associated to the controller, you can mount the LAP in its final location and allow it to reassociate to the controller. Follow these steps to complete final installation of the LAP:

Move the LAP to the Mount Location

Follow these steps to move the LAP to the site where you want to mount it:

1. Power off the LAP and disconnect it from the router.
2. Move the LAP to its final location as determined in the wireless site survey. For more information about how to perform a wireless site survey, refer to the [Site Survey](#).

Mount the LAP

Follow these steps to install the LAP at its final operating location.

1. Mount the LAP using the instructions included with your device.
2. If you have optional external antennas for an 1240 series LAP, attach the antennas to the connectors on the side of the AP. Tighten the antennas by hand.

Reconnect the LAP

Follow these steps to reconnect the LAP to the network:

1. Reconnect power to the LAP with an external power supply or PoE.
2. Connect the LAP to the switch port that you chose in the switch port assignments section of the Integrated Services Router Worksheet.
3. The LAP repeats the steps to associate to the controller.

Note: If the LAP does not associate to a controller after 5 minutes, see [Troubleshoot the Procedure](#).

[Back to Top](#)

Next Step

You have completed this procedure.

For instructions on how to configure wireless clients to communicate with the LAPs and WLCM, refer to [Install the Wireless Client Adapter](#).

If you set up security for a RADIUS server and want to add users, refer to the documentation for your RADIUS server. If you set up wireless security for a Pre-Shared Key, it is not necessary to add users to the controller as each device uses the same Pre-Shared Key to access the network.

To make further changes to your WLCM or LAPs, refer to the [Wireless Support](#) page.

To make further changes to your network, refer to the [Configuration Overview](#) page.

[Back to Top](#)

Troubleshoot the Procedure

This section provides information about common problems that you may encounter. If this information does not solve your problem, contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

Problem	Cause(s) and Suggested Solution(s)
<p>The LAP does not associate to the controller.</p>	<ul style="list-style-type: none"> • Ensure that the router has the correct configuration described in Configure Your Router for the Wireless LAN Controller Module. • Ensure that the WLCM has the correct configuration described in Configure the Wireless LAN Controller Module. • Ensure that switch port attached to the LAP has been moved to the correct VLAN. For further instructions, refer to Configure Your Router for the Wireless LAN Controller Module. • Review the LAP LEDs to determine the fault. For a complete listing of LEDs, refer to the hardware documentation included with your LAP. • Contact the SMB Technical Assistance Center (SMB TAC) for assistance.

If you are using PoE to power the LAP, review these steps:

- If you are using PoE provided by the router, verify that that the router switch module supports PoE.
- If you are using a power injector, check the connection between the power injector and the LAP.
- If you are using a power injector, check the connection between the power injector and the router.
- Contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

If you are using an external power supply to power the LAP, review these steps:

- Check the connection between the power supply and the electrical outlet.
- Check the connection between the power supply and the LAP
- Contact the [SMB Technical Assistance Center \(SMB TAC\)](#) for assistance.

I am unable to power the LAP.

[Back to Top](#)

Related Information

- [Site Survey](#)
- [Configure the Wireless LAN Controller Module](#)
- [Configure Your Router for the Wireless LAN Controller Module](#)
- [Set Up a RADIUS Server for the Wireless LAN Controller Module](#)