



Create a Virtual LAN for Guest Users on an Integrated Services Router

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Introduction

This document provides instructions for how to create a virtual LAN (VLAN) for guest users on your network. A Guest VLAN gives guest users access to the Internet and separates them from the rest of the network.

Note: VLANs are not supported on Cisco 800 series and SB 100 series routers.

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Requirements

- You must have completed these worksheets from the [Site Survey](#):
 - LAN Addressing Worksheet
 - Internet Worksheet
 - Firewall Worksheet
- You must have completed the initial configuration of your router. If you have not configured your router, refer to the [Site Survey](#).

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VLAN Overview

This section provides an overview of the Guest VLAN and how to use VLANs in your network.

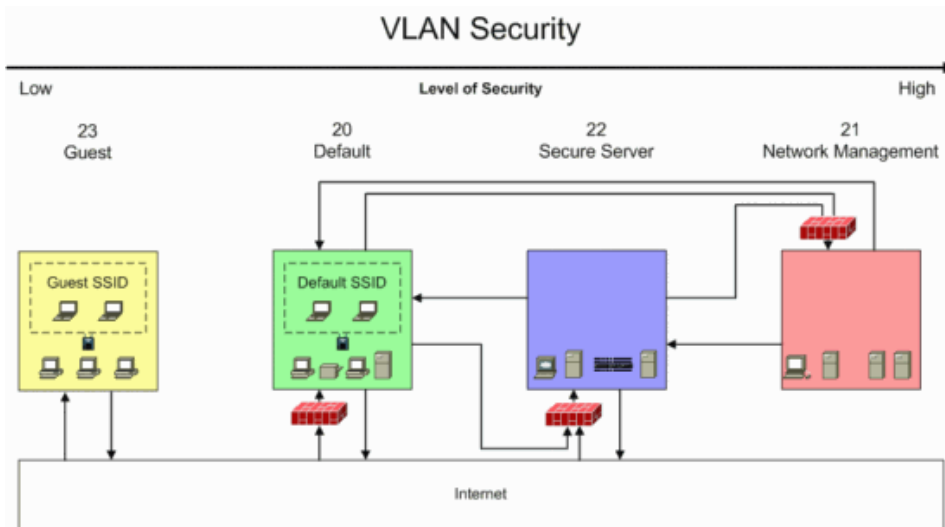
Supported VLANs

The Site IP Addressing Plan includes subnets for up to four virtual LANs (VLANs) at each site. Each VLAN has a custom level of security for a specific type of computer on the network, and uses firewalls to control access between VLANs.

The site survey defines these VLANs:

1. Default VLAN (20)
2. Network Management VLAN (21)
3. Secure Server VLAN (22)
4. Guest VLAN (23)

The diagram gives an overview of each VLAN in the network. For more information on other VLANs, refer to the [Configuration Overview](#) page.



The Guest VLAN

A Guest VLAN gives guest users access to the Internet and separates them from the rest of the network.

The Guest VLAN provides these benefits:

- Guest users can send traffic to the Internet and receive valid responses
- Guest users cannot communicate with other VLANs
- Guest users can only use up to 256k bandwidth of the Internet connection
- If you have a wireless access point or a wireless router, you can allow users to access the Guest VLAN with a wireless connection.

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Enable the Guest VLAN

Follow these steps to configure the Guest VLAN on an Integrated Services Router:

Enable the VLAN on the Router

To enable the Guest VLAN on the router, follow these steps:

1. Follow these steps to create connect to the router with Telnet.
 - a. Click **Start > Run**.
 - b. In the Run dialog box, type **cmd** or **command**, and then click **OK** to open a command prompt window.
 - c. 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.
 - d. Log into the router with the router password that you entered in field B11 of the Integrated Services Router Worksheet. For more information about how to access the router, refer to [Configure Your Router with Security Device Manager](#).
2. Type **enable** and press **Enter** to enter privileged mode. Enter the enable password that you entered in field B12 of the Integrated Services Router Worksheet.

```
Router> enable
Router#
```

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

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

4. Type **interface vlan 23** and press **Enter**.

```
Router(config)#interface vlan 23
```

5. Type **description 256kbps Guest network** and press **Enter**.

```
Router(config-if)#description 256kbps Guest network
```

6. Type **encapsulation dot1Q 23** and press **Enter**.

```
Router(config-if)#encapsulation dot1Q 23
```

7. Type **ip address router-ip-address 255.255.255.0** and press **Enter**. For **router-ip-address**, use the Guest network router IP address that you entered in field L6D of the LAN Addressing Worksheet.

```
Router(config-if)#ip address 192.168.13.1 255.255.255.0
```

8. Type **ip nat inside** and press **Enter**.

```
Router(config-if)#ip nat inside
```

9. Type **rate-limit output 256000 4000 8000 conform-action transmit exceed-action drop** and press **Enter**.

```
Router(config-if)#rate-limit input 256000 4000 8000 conform-action  
transmit exceed-action drop
```

10. Type **rate-limit input 256000 4000 8000 conform-action transmit exceed-action drop** and press **Enter**.

```
Router(config-if)#rate-limit input 256000 4000 8000 conform-action  
transmit exceed-action drop
```

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

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

Enable DHCP

To enable DHCP for the Guest network, follow these steps:

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

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

2. Type **network guest-network 255.255.255.0** and press **Enter**. For **guest-network**, enter the subnet for the guest network that you entered in field L1D of the LAN Addressing Worksheet.

```
Router(dhcp-config)#network 192.168.13.0 255.255.255.0
```

3. 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
```

4. 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 198.6.1.1
```

5. Type **default-router router-ip-address** and press **Enter**. For **router-ip-address**, use the router IP address that you entered in field L6D of the the Guest VLAN Addressing Worksheet.

```
Router(dhcp-config)#default-router 192.168.13.1
```

6. Type **exit** and press **Enter**.

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

7. Type **ip dhcp excluded-address dhcp-server end-static-range** and press **Enter**. For **dhcp-server**, use the DHCP Server for the Guest network that you entered in field L3D of the LAN Addressing Worksheet. For **end-static-range**, use the first three octets of the Guest network followed by .49.

```
Router(config)#ip dhcp excluded-address 192.168.13.1 192.168.13.49
```

8. Type **ip dhcp excluded-address dhcp-end-range end-guest-range** and press **Enter**. For **dhcp-end-range**, use the DHCP End Range for the Guest network that you entered in field L51D of the LAN Addressing Worksheet. For **end-guest-range**, use the first three octets of the Guest network followed by .254.

```
Router(config)#ip dhcp excluded-address 192.168.13.250
192.168.13.254
```

Enable Security

To enable security for the Guest network, follow these steps:

1. Type **access-list 23 permit guest-subnet 0.0.0.255** and press **Enter**. For **guest-subnet**, use the subnet that you entered in field L1D of the Guest VLAN Addressing Worksheet.

```
Router(config)#access-list 23 permit 192.168.13.0 0.0.0.255
```

2. Type **ip nat inside source list 23 interface wan-interface overload** and press **Enter**. For **wan-interface**, use the Internet interface that you entered in field B37 of the Router worksheet.

Note: If you have more than one available Internet interface, choose the Internet interface that will be your primary connection to the Internet.

```
Router(config)#ip nat inside source list 23 interface Ethernet0/1
overload
```

3. Follow these steps to create firewall rules for the Guest VLAN:

- a. Type **no access-list 123** and press **Enter**.

```
Router(config)#no access-list 123
```

- b. Type **access-list 123 remark Traffic from Guest VLAN** and press **Enter**.

```
Router(config)#access-list 123 remark Traffic from Guest
VLAN
```

- c. Type **access-list 123 permit ip any host 255.255.255.255** and press **Enter**.

```
Router(config)#access-list 123 permit ip any host
255.255.255.255
```

- d. Type **access-list 123 permit udp any any eq bootps** and press **Enter**.

```
Router(config)#access-list 123 permit udp any any eq bootps
```

- e. Type **access-list 123 deny ip any 192.168.0.0 0.0.255.255** and press **Enter**.

```
Router(config)#access-list 123 deny ip any 192.168.0.0 0.0.255.255
```

- f. Type **access-list 123 permit ip guest-subnet 0.0.0.255 any** and press **Enter**. For **guest-subnet**, use the subnet that you entered in field L1D of the Guest LAN Addressing Worksheet.

```
Router(config)#access-list 123 permit ip 192.168.13.0 0.0.0.255 any
```

- g. Type **access-list 123 permit ip guest-subnet 0.0.0.255 any** and press **Enter**. For **guest-subnet**, use the subnet that you entered in field L1D of the LAN Addressing Worksheet.

```
Router(config)#access-list 123 permit ip 192.168.13.0 0.0.0.255
any
```

- Type **interface vlan 23** and press **Enter**. For *ethernet-interface-name*, use the name of the first Ethernet interface that you entered in field B35 of the Router worksheet.

```
Router(config)#interface vlan 23
```

- Type **ip access-group 123 in** and press **Enter**.

```
Router(config-if)#ip access-group 123 in
```

- Type **end** and press **Enter** to exit configuration mode.

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

- Type **write memory** and press **Enter** to save your configuration.

```
Router#write memory
```

Enable the VLAN on an Integrated Switch

Follow these steps to enable the Guest VLAN on an integrated switch:

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

```
Router> enable  
Router#
```

2. Type **vlan database** and press **Enter**.

```
Router#vlan database  
Router(vlan)#
```

3. Type **vlan 23 name Guest media ethernet state active** and press **Enter**.

```
Router(vlan)#vlan 23 name Guest media ethernet state  
active
```

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

```
Router(vlan)#exit  
APPLY completed.  
Exiting....  
Router#
```

5. Type **configure terminal** and press **Enter**.

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

6. Type **spanning-tree vlan 23 root primary** and press **Enter**.

```
Router(config-if)#spanning-tree vlan 23 root primary  
VLAN 23 bridge priority set to 8192  
VLAN 23 bridge max aging time unchanged at 20  
VLAN 23 bridge hello time unchanged at 2  
VLAN 23 bridge forward delay unchanged at 15
```

7. Type **end** and press **Enter**.

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

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

```
Router#write memory
```

9. To enable wireless access to the Guest VLAN, proceed to the next section. If you do not want to enable wireless access to the Guest VLAN, proceed to [Add Users](#).

Enable Guest on Wireless

Follow these steps to enable the guest network on the wireless antenna of your ISR:

Note: If you have an ISR without a wireless antenna but that is connected to an AP, see [Enable the Guest Network for an External AP](#)

1. Type **configure terminal** and press **Enter**.

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

2. Follow these steps to configure the first radio interface:

- a. Type **interface dot11Radio0** and press **Enter**.

```
Router(config)#interface dot11Radio0
Router(config-if)#
```

- b. Type **ssid guest** and press **Enter**.

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

- c. Type **vlan 23** and press **Enter**.

```
Router(config-if)#vlan 23
```

- d. Type **authentication open** and press **Enter**.

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

- e. Type **guest-mode** and press **Enter**.

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

- f. Type **interface dot11Radio0.23** and press **Enter**.

```
Router(config-if)#interface dot11Radio0.23
```

- g. Type **encapsulation dot1Q 23** and press **Enter**.

```
Router(config-subif)#encapsulation dot1Q 23
```

- h. Type **no cdp enable** and press **Enter**.

```
Router(config-subif)#no cdp enable
```

- If you have an Integrated Services Router with a 5.8 Ghz radio, follow these steps to configure the second radio interface:

Note: If your router does not have a 5.8 Ghz radio, proceed to the next step.

- a. Type **interface dot11Radio1** and press **Enter**.

```
Router(config)#interface dot11Radio1
Router(config-if)#
```

- b. Type **ssid guest** and press **Enter**.

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

- c. Type **vlan 23** and press **Enter**.

```
Router(config-if)#vlan 23
```

d. Type **authentication open** and press **Enter**.

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

e. Type **guest-mode** and press **Enter**.

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

f. Type **interface dot11Radio1.23** and press **Enter**.

```
Router(config-if)#interface dot11Radio1.23
```

g. Type **encapsulation dot1Q 23** and press **Enter**.

```
Router(config-subif)#encapsulation dot1Q 23
```

h. Type **no cdp enable** and press **Enter**.

```
Router(config-subif)#no cdp enable
```

- Type **end** and press **Enter**.

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

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

```
Router#write memory
```

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

```
Router#exit
```

- Proceed to [Add Users](#).

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Enable the Guest Network for an External AP

To configure an external access point (AP) connected to an Integrated Service Router (ISR), follow these steps:

Modify the Router

Follow these steps to modify your router to support the Guest VLAN on an external AP:

Note: If you have a router with an integrated switch and built-in wireless antenna, see [Enable the Guest Network](#).

1. Type **configure terminal** and press **Enter**.

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

2. Type **interface ethernet-interface-name** and press **Enter**. For **ethernet-interface-name**, use the name of the Ethernet interface that is attached to the wireless AP. All of the Ethernet interfaces are listed in field B35 of the Router worksheet.

```
Router(config)#interface FastEthernet0/5
```

3. Type **description Wireless AP** and press **Enter**.

```
Router(config-if)#description Wireless AP
```

4. Type **switchport mode trunk** and press **Enter**.

```
Router(config-if)#switchport mode trunk
```

5. Type **switchport trunk encapsulation dot1q** and press **Enter**.

```
Router(config-if)#switchport trunk encapsulation dot1q
```

6. Type **switchport trunk allowed vlan add 23** and press **Enter**.

```
Router(config-if)#switchport trunk allowed vlan add 23
```

7. Type **end** and press **Enter**.

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

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

```
Router#write memory
```

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

```
Router#exit
```

Modify the AP

If you have an wireless access point, follow these steps to enable the Guest VLAN for wireless users:

Note: The wireless configuration does not provide user authentication. Any wireless computer within range of the Access Point can access the wireless Guest network.

1. Follow these steps to create connect to the AP with Telnet.
 - a. Click **Start > Run**.
 - b. In the Run dialog box, type **cmd** or **command**, and then click **OK** to open a command prompt window.
 - c. At the command prompt, type **telnet ap-ip-address** and press **Enter**. For **ap-ip-address**, use the AP IP address that you entered in field W10 of the Wireless Worksheet.
 - d. Log into the AP with the password you entered in field S5 of the Wireless Worksheet.
2. Type **enable** and press **Enter**. Enter the enable password that you entered in field W15 of the Wireless Worksheet and press **Enter**.

```
ap>enable  
ap#
```

3. Type **configure terminal** and press **Enter**.

```
ap#configure terminal  
ap(config)#
```

4. Follow these steps to configure the first radio interface:

- a. Type **interface dot11Radio0** and press **Enter**.

```
ap(config)#interface dot11Radio0  
ap(config-if)#
```

- b. Type **ssid guest** and press **Enter**.

```
ap(config-if)#ssid guest
```

- c. Type **guest-mode** and press **Enter**.

```
ap(config-if-ssid)#guest-mode
```

- d. Type **vlan 23** and press **Enter**.

```
ap(config-if-ssid)#vlan 23
```

- e. Type **authentication open** and press **Enter**.

```
ap(config-if-ssid)#authentication open
```

f. Type **exit** and press **Enter**.

```
ap(config-if-ssid)#exit
ap(config-if)#
```

g. Type **interface dot11Radio0.23** and press **Enter**.

```
ap(config-if)#interface dot11Radio0.23
```

h. Type **encapsulation dot1Q 23** and press **Enter**.

```
ap(config-subif)#encapsulation dot1Q 23
```

i. Type **no cdp enable** and press **Enter**.

```
ap(config-subif)#no cdp enable
```

j. Type **bridge-group 23** and press **Enter**.

```
ap(config-subif)#bridge-group 23
```

- If you have an Aironet 1200 series AP with a 5 Hz radio, follow these steps to configure the second radio interface:

Note: If your AP does not have a 5 Hz radio, proceed to the next step.

a. Type **interface dot11Radio1** and press **Enter**.

```
ap(config)#interface dot11Radio1
ap(config-if)#
```

b. Type **ssid guest** and press **Enter**.

```
ap(config-if)#ssid guest
```

c. Type **guest-mode** and press **Enter**.

```
ap(config-if-ssid)#guest-mode
```

d. Type **vlan 23** and press **Enter**.

```
ap(config-if-ssid)#vlan 23
```

e. Type **authentication open** and press **Enter**.

```
ap(config-if-ssid)#authentication open
```

f. Type **exit** and press **Enter**.

```
ap(config-if-ssid)#exit
ap(config-if)#
```

g. Type **interface dot11Radio1.23** and press **Enter**.

```
ap(config-if)#interface dot11Radio1.23
```

h. Type **encapsulation dot1Q 23** and press **Enter**.

```
ap(config-subif)#encapsulation dot1Q 23
```

i. Type **no cdp enable** and press **Enter**.

```
ap(config-subif)#no cdp enable
```

j. Type **bridge-group 23** and press **Enter**.

```
ap(config-subif)#bridge-group 23
```

- Type **interface FastEthernet0.23** and press **Enter**.

```
ap(config-subif)#interface FastEthernet0.23
```

- Type **encapsulation dot1Q 23** and press **Enter**.

```
ap(config-subif)#encapsulation dot1Q
23
```

- Type **bridge-group 23** and press **Enter**.

```
ap(config-subif)#bridge-group 23
```

- Type **end** and press **Enter**.

```
ap(config-subif)#end
ap#
```

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

```
ap#write memory
```

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

```
ap#exit
```

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Add Users

To move users to the Guest VLAN, follow these steps:

Add a Wired Guest User

Follow these steps to add a guest user connected directly to a switch port on the ISR:

1. Type **configure terminal** and press **Enter**.

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

2. 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 Guest user. The available switch ports are listed in field B36 of the Router Worksheet.

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

3. Type **description Guest Switch Port** and press **Enter**.

```
Router(config-if)#description Guest Switch Port
```

4. Type **switchport access vlan 23** and press **Enter**.

```
Router(config-if)#switchport access vlan 23
```

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

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

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

```
Router#write memory
```

7. Record the device name in the first available field from fields L8-L35 of the Guest VLAN Addressing Worksheet.

8. Ensure that the guest device is configured to receive an IP address automatically. For more information about how to configure an IP address on a PC, refer to [Configure an IP Address on Your PC](#).

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Next Step

You have now set up a Guest VLAN on your network.

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

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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 with Security Device Manager (SDM).	Refer to Configure Your Router with Security Device Manager
I cannot telnet to my external wireless Access Point (AP).	Refer to Configure the Access Point . To enable telnet, go to Services > Telnet/SSH .
I have a guest user that cannot connect to the network on the Guest VLAN	<ul style="list-style-type: none">• For a wired user, refer to Move a LAN User Between Groups to move the appropriate switch port to the Guest VLAN.• For a wireless user, refer to Configure the Wireless Client Adapter to move the user to the Guest VLAN.

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Related Information

- [Site Survey](#)
- [Create a HyperTerminal Connection](#)
- [Configure Your Router with Security Device Manager](#)
- [Configure the Access Point](#)
- [Move a LAN User Between Groups](#)
- [Configure the Wireless Client Adapter](#)