

VLANs on Wireless LAN Controllers Configuration Example

Document ID: 68100

Introduction

Prerequisites

- Requirements

- Components Used

- Conventions

Dynamic Interfaces on WLCs

Configure

- Catalyst Switch Configurations

- WLAN Controller VLAN Configuration

Verify

- Catalyst Switches Verification

- WLAN Controller VLAN Verification

Troubleshoot

- Troubleshooting Procedure

Related Information

Introduction

This document provides a sample configuration for VLANs on wireless LAN (WLAN) controllers.

Prerequisites

Requirements

There are no specific requirements for this document. However, this document assumes that there is a working DHCP server to provide IP addresses to the access points (APs) that are registered to the controller.

Components Used

The information in this document is based on these software and hardware versions:

- **Configuration A:**

- ◆ Catalyst switch that runs Cisco IOS® Software and a WLAN controller
- ◆ Cisco 4404 WLAN Controller that runs software version 5.1

- **Configuration B:**

- ◆ Catalyst switch that runs Catalyst OS (CatOS) software and a WLAN controller
- ◆ Cisco 4404 WLAN Controller that runs software version 5.1

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

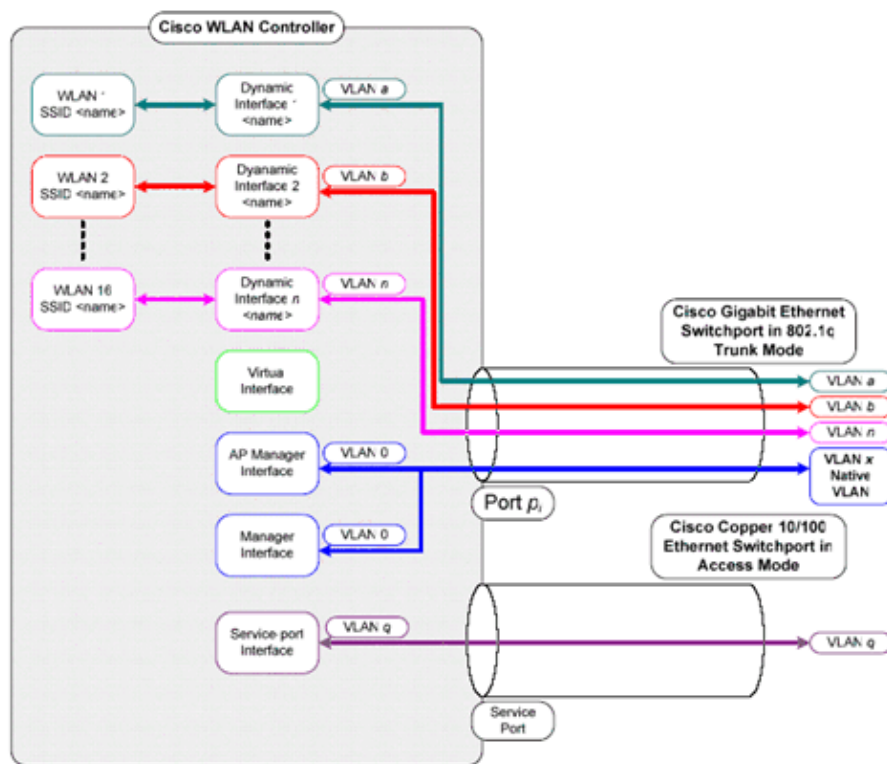
Refer to Cisco Technical Tips Conventions for more information on document conventions.

Dynamic Interfaces on WLCs

Dynamic interfaces, also known as VLAN interfaces, are created by users and designed to be analogous to VLANs for Wireless LAN clients. A controller can support up to 512 dynamic interfaces (VLANs). Each dynamic interface is individually configured and allows separate communication streams to exist on any or all of the distribution system ports of the controller. Each dynamic interface controls VLAN and other communications between controllers and all other network devices, and each acts as a DHCP relay for wireless clients associated to WLANs mapped to the interface. You can assign dynamic interfaces to distribution system ports, WLANs, the Layer 2 management interface, and the Layer 3 AP–manager interface, and you can map the dynamic interface to a backup port.

Refer to Configuring the Management, AP–Manager, Virtual, and Service–Port Interfaces for information on how to configure the different ports on the Wireless LAN Controller.

VLANs with WLAN controllers use this model:



Configure

In this section, you are presented with the information to configure the features described in this document.

Note: Use the Command Lookup Tool (registered customers only) to find more information on the commands used in this document.

Catalyst Switch Configurations

This section uses these configurations:

- Catalyst Switch That Runs Cisco IOS Software
- Catalyst Switch That Runs CatOS Software

```
Catalyst Switch That Runs Cisco IOS Software

lablsup720ip1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
lablsup720ip1(config)#interface gigabitethernet 1/6
lablsup720ip1(config-if)#
lablsup720ip1(config-if)#switchport
lablsup720ip1(config-if)#switchport trunk encapsulation dot1q
lablsup720ip1(config-if)#switchport trunk allowed vlan 1,5,15,20,25,30,35,40,45,50,55,100
lablsup720ip1(config-if)#switchport mode trunk
lablsup720ip1(config-if)#end
lablsup720ip1#
```

```
Catalyst Switch That Runs CatOS Software

controller-catos> (enable) set trunk 2/1 on dot1q
Port(s) 2/1 trunk mode set to on.
Port(s) 2/1 trunk type set to dot1q.
!
!clearing out/pruning unwanted vlans
!
controller-catos> (enable) clear trunk 2/1 21-24,26-30,31-34,36-39,41-44,46-49,51-54,
56-99,101-999

!--- This command should be on one line.

Removing Vlan(s) 21-24,26-34,36-39,41-44,46-49,51-54,56-99,101-999 from allowed list.
Port 2/1 allowed vlans modified to 1,5,15,20,25,35,40,45,50,55,100,1000-1005,1025-4094.
```

WLAN Controller VLAN Configuration

GUI Configuration

Complete these steps on the WLAN controller.

1. From the WLC GUI, choose **Controller > Interfaces**. The **Interfaces** page lists all the interfaces that are configured on the WLC. In order to create a new dynamic interface, click **New**.



2. Enter the Interface Name and VLAN Identifier and click **Apply**.



3. Enter the parameters specific to this VLAN. Some of the parameters include the IP Address, Netmask, Gateway, and the DHCP server IP address, and click **Apply**. Here is a list of all the parameters that can be configured on this page.

Parameter	Description
General Information	
Interface Name	Name of the interface.
MAC Address	MAC address of the interface.
Configuration	
Guest LAN	Check to indicate that this is a guest LAN.
Quarantine	Check to indicate that this is a quarantine VLAN. It is used only for the H-REAP-associated clients. When a client is assigned to a quarantine VLAN, its data switching is always central.
Physical Information	
Port Number	The primary port for the interface.
Backup Port	Specify the backup port. If the primary port for an interface fails, the interface automatically moves to the backup port.
Active Port	The active port for the interface.
Enable Dynamic AP Management	Check to indicate that the interface is an AP-manager interface.
Interface Address	
VLAN Identifier	Virtual LAN assigned to the interface.
IP Address	The IP address of the interface.
Netmask	Interface subnet mask.
Gateway	Interface gateway router IP address.
DHCP Information	
Primary DHCP Server	The interface uses this DHCP server first to obtain an IP address.
Secondary DHCP Server	The interface uses this DHCP server as a backup to obtain an IP address.
Access Control List	
ACL Name	Any of the Access Control Lists currently displayed on the Access Control Lists page.
	Note Applying an ACL to the management interface does not affect wired devices. To block access to wired devices, configure an ACL on the upstream device port.

Here is an example.

The screenshot displays the Cisco Controller configuration interface for 'vlan15'. The left sidebar shows the navigation menu with 'Controller' selected. The main content area is titled 'Interfaces > Edit' and contains several configuration sections:

- General Information:** Interface Name: vlan15, MAC Address: 00:0b:85:48:53:c0.
- Configuration:** Guest Lan (checkbox), Quarantine (checkbox).
- Physical Information:** Port Number: 2, Backup Port: 0, Active Port: 0, Enable Dynamic AP Management (checkbox).
- Interface Address:** VLAN Identifier: 15, IP Address: 192.168.15.10, Netmask: 255.255.255.0, Gateway: 192.168.15.1.
- DHCP Information:** Primary DHCP Server: 192.168.5.15, Secondary DHCP Server: (empty).
- Access Control List:** ACL Name: none.

Note: The IP address assigned to this interface acts as the DHCP relay for a client to obtain an IP address from the DHCP server. For example, when a client attempts to associate to a WLAN/SSID (see step 5 in this configuration) mapped to this dynamic interface, it performs a local subnet broadcast to identify the DHCP server. The controller sends a request to the DHCP server (or to itself if it is the DHCP server for the segment) with the IP address of this dynamic interface as relay IP to the DHCP server configured for this interface. The DHCP server assigns an IP address to the client from the configured DHCP scope.

4. Verify the interface configuration.

Click the **Controller** tab in the menu at the top of the window, and choose **Interfaces** from the menu on the left.



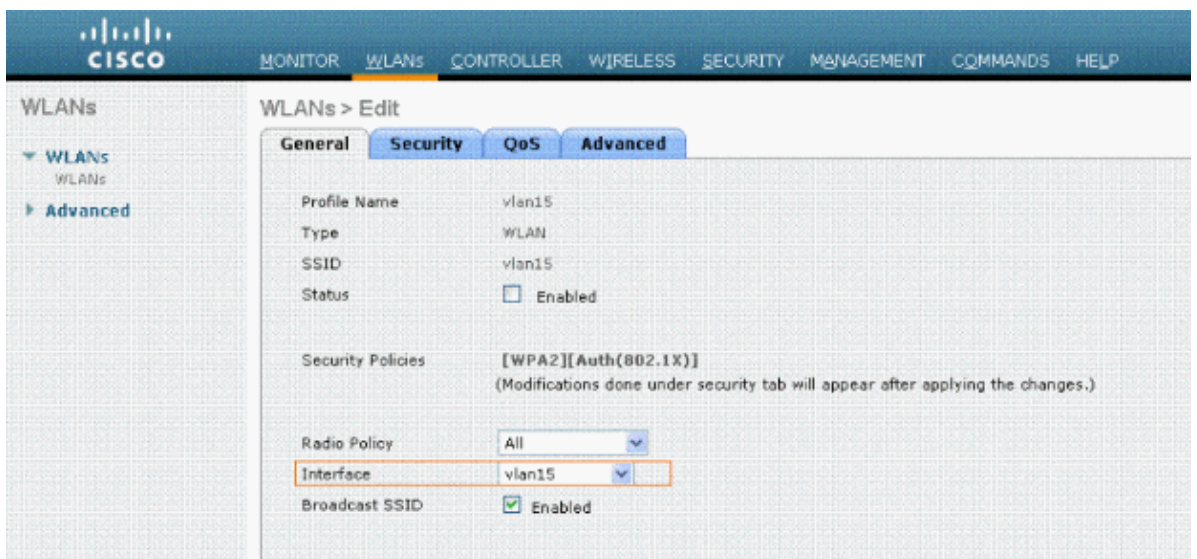
5. Click the **WLANS** tab in the menu at the top of the window, and click **New**.
6. Enter the service set identifier (SSID) and click **Apply**.

This example uses **vlan15** for ease of understanding.



7. Select **vlan15** from the Interface Name drop-down menu at the bottom of the window, and click **Apply**.

In this case, SSID **vlan15** is tied to Interface Name **vlan15**.



CLI Configuration

Use this section in order to configure your VLAN via command-line interface (CLI).

1. Create the interface and the associated VLAN tag.

The command is **config interface create** *interface_name* *vlan_id* .

```
(lab5wlc4404ip15) >config interface create vlan15 15
```

2. Define the IP address and default gateway.

The command is **config interface** *interface_name* *IP_address* *netmask* *gateway* .

```
(lab5wlc4404ip15) >config interface address vlan15 192.168.15.10
255.255.255.0 192.168.15.1
```

!--- This command should be on one line.

3. Define the DHCP server.

The command is **config interface dhcp** *interface_name* *dhcp_server 1* *dhcp_server 2* *dhcp_server 3* *dhcp_server 4* .

```
(lab5wlc4404ip15) >config interface dhcp vlan15 192.168.5.15
```

4. Verify the interface configuration.

The command is **show interface summary**.

```
(lab5wlc4404ip15) >show interface summary
```

Interface Name	Port	Vlan Id	IP Address	Type	Ap Mgr
ap-manager	1	untagged	192.168.5.215	Static	Yes
management	1	untagged	192.168.5.15	Static	No
service-port	N/A	N/A	100.100.100.100	Static	No
virtual	N/A	N/A	1.1.1.1	Static	No
vlan15	1	15	192.168.15.10	Dynamic	No

```
(lab5wlc4404ip15) >
```

5. Define the WLAN.

The command is **config wlan create** *wlan_id* *name* .

```
(lab5wlc4404ip15) >config wlan create 2 vlan15
```

6. Define the interface for the WLAN.

The command is **config wlan interface** *wlan_id* *interface_name* .

```
(lab5wlc4404ip15) >config wlan interface 2 vlan15
```

7. Verify the WLAN and the associated interface.

The command is **show wlan summary**.

```
(lab5wlc4404ip15) >show wlan summary
```

Number of WLANs..... 2

WLAN ID	WLAN Name	Status	Interface Name
1	lab5wlc4404ip15	Enabled	management
2	vlan15	Disabled	vlan15

```
(lab5wlc4404ip15) >
```

Verify

Use this section to confirm that your configuration works properly.

The Output Interpreter Tool (registered customers only) (OIT) supports certain **show** commands. Use the OIT to view an analysis of **show** command output.

Catalyst Switches Verification

- Catalyst switch that runs Cisco IOS Software **show running-config interface** *interface_type interface_number*

```
controller-ios#show running-config interface gigabitethernet 2/1

Building configuration...

Current configuration : 190 bytes
!
interface GigabitEthernet2/1
 no ip address
 switchport
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 1,5,15,20,25,30,35,40,45,50,55,100
 switchport mode trunk
end
```

- Catalyst switch that runs CatOS software **show config mod**

```
controller-catos> (enable) show config 2

!--- This command shows non-default configurations only.
!--- Issue the show config mod all command in order to
!--- show both default and non-default configurations.

.....
begin
!
# ***** NON-DEFAULT CONFIGURATION *****
!
!
#time: Sat Jan 7 2006, 08:03:04
!
# default port status is enable
!
!
#module 2 : 2-port 1000BaseX Supervisor
clear trunk 2/1 2-4,6-14,16-19,21-24,26-34,36-39,41-44,46-49,51-54,56-99,101-999
set trunk 2/1 on dot1q 1,5,15,20,25,35,40,45,50,55,100,1000-1005,1025-4094
end
Console> (enable)
```

WLAN Controller VLAN Verification

See the WLAN Controller VLAN Configuration section of this document, which includes verification steps.

Troubleshoot

Use this section to troubleshoot your configuration.

Troubleshooting Procedure

Complete these instructions in order to troubleshoot your configuration.

1. Ping from the WLAN controller to the default gateway that is configured on the VLAN routed interface, and then ping in the opposite direction.

- ◆ WLAN controller:

```
(lab5wlc4404ip15) >ping 192.168.15.1
```

```
Send count=3, Receive count=3 from 192.168.15.1
```

- ◆ VLAN routed interface:

```
lab1sup720ip1#ping 192.168.15.10
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 192.168.15.10, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4 ms
```

```
lab1sup720ip1#
```

2. If the pings are unsuccessful, deploy a packet capture/sniffer at the switch and check in order to verify proper VLAN tagging.

Note: When you initiate the ping from your controller to a Layer 3 gateway, which is on the same subnet as your dynamic interface, the controller appears to source the ping from the dynamic interface.

Related Information

- [Configuring a LAN Interface as a Layer 2 Access Port section of Configuring Layer 2 Ethernet Interfaces \(Catalyst switches that run Cisco IOS Software\)](#)
- [Configuring an 802.1Q Trunk section of Configuring Ethernet VLAN Trunks \(Catalyst switches that run CatOS\)](#)
- [Cisco Wireless LAN Controller Configuration Guide, Release 5.2](#)
- [Configuring Local and Remote SPAN \(Catalyst switches that run Cisco IOS Software\)](#)
- [Configuring SPAN and RSPAN \(Catalyst switches that run CatOS\)](#)
- [Configuring Wireless LANs](#)
- [Technical Support & Documentation – Cisco Systems](#)

[Contacts & Feedback](#) | [Help](#) | [Site Map](#)

© 2008 – 2009 Cisco Systems, Inc. All rights reserved. [Terms & Conditions](#) | [Privacy Statement](#) | [Cookie Policy](#) | [Trademarks of Cisco Systems, Inc.](#)

Updated: Jun 02, 2009

Document ID: 68100
