Cisco – Creating Ethernet VLANs on Catalyst Switches

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Creating Ethernet VLANs on Catalyst Switches

Introduction

This document provides basic information on how to create VLANs on Catalyst switches running CatOS, as well as Catalyst 2900 XL/3500 XL, 2950, and 3550 switches; the results of each command are displayed as they are executed. Cisco Catalyst 4000/2948G/2980G/4912G, Catalyst 5000/2926G, and Catalyst 6000 family switches (running CatOS), and any Catalyst 2900 XL , 3500 XL, 2950, or 3550 can be used in the scenarios presented in this document to obtain the same results.

This document does not provide information on how to configure VLANs on Catalyst 6000 and 4000 switches running Integrated Cisco IOS(Native Mode). For those details, please refer to the following documents:

- Configuring VLANs on Catalyst 6000
- Understanding and Configuring VLANs on Catalyst 4000

Important Notes

Virtual LANs (VLANs) are a mechanism to allow network administrators to create logical broadcast domains that can span across a single switch or multiple switches, regardless of physical proximity. This is useful for reducing the size of broadcast domains, or allowing groups or users to be logically grouped without being physically located in the same place.

In order to create VLANs, you must decide how to configure the following items:

- What VLAN Trunking Protocol (VTP) domain name and VTP mode will be used on this switch?
- What ports on the switch will belong to which VLAN?
- Will you need to have communication between VLANs, or will they be isolated? If you require communication between VLANs, you will need to use a L3 routing device, such as an external Cisco router or an internal router module such as a Route Switch Module (RSM) or a Multilayer Switch Feature Card (MSFC).

Note: For details on configuring InterVLAN routing on the MSFC, RSM, Route Switch Feature Card (RSFC), or an external router, refer to the following documents:

- For MSFCs, refer to Configuring InterVLAN Routing on the MSFC

- For RSMs/RSFCs/external router, refer to Configuring InterVLAN Routing
- For Catalyst 5000 and 6000, also refer to Configuring InterVLAN Routing Using an Internal Router (Layer 3 Card) on Catalyst 5000 and 6000 Switches Running CatOS
- For Catalyst 2900 XL/3500 XL/2950, refer to Configuring InterVLAN Routing and ISL/802.1Q Trunking on a Catalyst 2900 XL/3500 XL/2950 Switch Using An External Router

To create the examples in this document, we used the following switches in a lab environment with cleared configurations:

- Catalyst 6009 switch running Catalyst OS 5.5(x) software
- Catalyst 3524XL switch running Cisco IOS 12.0(5.x)XU

The configurations in this document were implemented in an isolated lab environment. Ensure that you understand the potential impact of any configuration or command on your network before using it.

Note: This document assumes that you have basic connectivity to the switch, either through the console or through Telnet access. For details on how to get basic connectivity to the switches, refer to the following documents:

- For Catalyst 6000 switches, refer to Basic Software Configuration
- For XL Series Switches, refer to Quick Start Guide

Configuring the VLAN on Catalyst Switches Running CatOS

Step 1 Before you can create a VLAN, the switch must be in VTP server mode or VTP transparent mode. If the switch is a VTP server, you must define a VTP domain name before you can add any VLANs. This has to be defined regardless of the number of switches in the network (one or many), or whether or not you will be using VTP to propagate VLANs to other switches in the network. For details on VTP, please refer to the Understanding and Configuring VLAN Trunk Protocol (VTP) document.

The default VTP configuration on the switch is as follows:

```
CatosSwitch> (enable) show vtp domain
Domain Name                      Domain Index VTP Version Local Mode  Password
-------------------------------- ------------ ----------- ----------- ----------
                                 1            2           server      -

Vlan-count Max-vlan-storage Config Revision Notifications
---------- ---------------- --------------- -------------
5          1023             0               disabled

Last Updater    V2 Mode  Pruning  PruneEligible on Vlans
--------------- -------- -------- --------------------------
0.0.0.0         disabled disabled 2-1000
```

Use the **set vtp** command to set the domain name and mode.

```
CatosSwitch> (enable) set vtp domain ?
```

```
<name>                      Domain name
CatosSwitch> (enable) set vtp domain cisco ?
  mode                        Set VTP mode
  passwd                      Set VTP password
  pruning                     Set VTP pruning
  v2                          Set VTP version 2
  <cr>
CatosSwitch> (enable) set vtp domain cisco mode ?
  client                      VTP client mode
  server                      VTP server mode
  transparent                 VTP transparent mode
CatosSwitch> (enable) set vtp domain cisco mode server
VTP domain cisco modified
```

Step 2 Verify VTP configuration by using the **show vtp domain** command.

```
CatosSwitch> (enable) show vtp domain
Domain Name                    Domain Index VTP Version Local Mode  Password
------------------------------ ------------ ----------- ----------- ----------
cisco                          1            2           server      -

Vlan-count Max-vlan-storage Config Revision Notifications
---------- ---------------- --------------- -------------
5          1023             1               disabled

Last Updater    V2 Mode  Pruning  PruneEligible on Vlans
--------------- -------- -------- -------------------------
0.0.0.0         disabled disabled 2-1000
```

If you have the output of a **show vtp domain** command from your Cisco device, you can use to display potential issues and fixes. To use , you must be a registered user, be logged in, and have JavaScript enabled. You can use Output Interpreter to display potential issues and fixes. To use Output Interpreter, you must be a registered user, be logged in, and have JavaScript enabled.

Step 3 Once the VTP domain has been set and verified, you can begin to create VLANs on the switch. By default, there is only a single VLAN for all ports, and this VLAN is called the *default*. VLAN1 cannot be renamed or deleted.

You can use the **show vlan** command to display the parameters for all configured VLANs in the administrative domain, as shown below:

```
CatosSwitch> (enable) show vlan
VLAN Name                            Status    IfIndex Mod/Ports, Vlans
---- ------------------------------- --------- ------- -------------------------
1    default                         active    5       1/1-2
                                                       3/1-48
                                                       4/1-16
1002 fddi-default                    active    6
1003 token-ring-default              active    9
1004 fddinet-default                 active    7
1005 trnet-default                   active    8


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
1    enet  100001     1500  -      -      -      -    -        0      0
1002 fddi  101002     1500  -      -      -      -    -        0      0
1003 trcrf 101003     1500  -      -      -      -    -        0      0
1004 fdnet 101004     1500  -      -      -      -    -        0      0
1005 trbrf 101005     1500  -      -      -      ibm  -        0      0
```

```
VLAN DynCreated  RSPAN
---- ---------- --------
1    static     disabled
1002 static     disabled
1003 static     disabled
1004 static     disabled
1005 static     disabled


VLAN AREHops STEHops Backup CRF 1q VLAN
---- ------- ------- ---------- -------
1003 7       7       off
```

To create VLANs, use the **set vlan** command, as show below:

```
CatosSwitch> (enable) set vlan
Usage: set vlan <vlan> <mod/port>
       (An example of mod/port is 1/1,2/1-12,3/1-2,4/1-12)
       set vlan <vlan_num> [name <name>] [type <type>] [state <state>]
                           [pvlan-type <pvlan_type>]
                           [said <said>] [mtu <mtu>] [ring <hex_ring_number>]
                           [decring <decimal_ring_number>]
                           [bridge <bridge_number>] [parent <vlan_num>]
                           [mode <bridge_mode>] [stp <stp_type>]
                           [translation <vlan_num>] [backupcrf <off|on>]
                           [aremaxhop <hopcount>] [stemaxhop <hopcount>]
                           [rspan]
       (name = 1..32 characters, state = (active, suspend)
        type = (ethernet, fddi, fddinet, trcrf, trbrf)
        said = 1..4294967294, mtu = 576..18190
        pvlan-type = (primary,isolated,community,none)
        hex_ring_number = 0x1..0xfff, decimal_ring_number = 1..4095
        bridge_number = 0x1..0xf, parent = 2..1005, mode = (srt, srb)
        stp = (ieee, IBM, auto), translation = 1..1005
        hopcount = 1..13)
Set vlan commands:
--------------------------------------------------------------------------------
set vlan                    Set vlan information
set vlan mapping            Map an 802.1q vlan to an Ethernet vlan


CatosSwitch> (enable) set vlan 2 name cisco_vlan_2
Vlan 2 configuration successful
```

Note: You can verify the VLAN configuration by using the **show vlan** command, as shown below:

```
CatosSwitch> (enable) show vlan
VLAN Name                             Status    IfIndex Mod/Ports, Vlans
---- -------------------------------- --------- ------- -------------------------
1    default                          active    5       1/1-2
                                                        3/1-48
                                                        4/1-16
2    cisco_vlan_2                     active    75
1002 fddi-default                     active    6
1003 token-ring-default               active    9
1004 fddinet-default                  active    7
1005 trnet-default                    active    8


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
1    enet  100001     1500  -      -      -      -    -        0      0
```

```
2    enet  100002     1500  -      -      -      -    -        0      0
1002 fddi  101002     1500  -      -      -      -    -        0      0
1003 trcrf 101003     1500  -      -      -      -    -        0      0
1004 fdnet 101004     1500  -      -      -      -    -        0      0
1005 trbrf 101005     1500  -      -      -      IBM  -        0      0

(Output Suppressed...)
```

Step 4 If you want to add ports to the VLAN, use the **set vlan**<***vlan#***> <***mod/ports***> **...** command.

```
CatosSwitch> (enable) set vlan 2 3/1-12
VLAN 2 modified.
VLAN 1 modified.
VLAN  Mod/Ports
---- ---------------------
2     3/1-12
      15/1
```

Note: You can also create the VLAN and add the ports to that VLAN with all the information in a single command.

For example, if you want to create the third VLAN and then assign ports 3/13−3/15 to that VLAN, use the following command:

```
CatosSwitch> (enable) set vlan 3 3/13-15
Vlan 3 configuration successful
VLAN 3 modified.
VLAN 1 modified.
VLAN  Mod/Ports
---- ---------------------
3     3/13-15
      15/1
```

Step 5 Verify VLAN configuration by using **show vlan** command.

```
CatosSwitch> (enable) show vlan
VLAN Name                             Status    IfIndex Mod/Ports, Vlans
---- -------------------------------- --------- ------- -------------------------
1    default                          active    5       1/1-2
                                                        3/16-48
                                                        4/1-16
2    cisco_vlan_2                     active    75      3/1-12
3    VLAN0003                         active    76      3/13-15
1002 fddi-default                     active    6
1003 token-ring-default               active    9
1004 fddinet-default                  active    7
1005 trnet-default                    active    8


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
1    enet  100001     1500  -      -      -      -    -        0      0
2    enet  100002     1500  -      -      -      -    -        0      0
3    enet  100003     1500  -      -      -      -    -        0      0
1002 fddi  101002     1500  -      -      -      -    -        0      0
1003 trcrf 101003     1500  -      -      -      -    -        0      0
1004 fdnet 101004     1500  -      -      -      -    -        0      0
1005 trbrf 101005     1500  -      -      -      IBM  -        0      0

(Output Suppressed...)
```

To remove ports from a VLAN, use the **set vlan <*vlan#*> <*mod/ports*>...** command and place the ports in a different VLAN. This is essentially what you are doing when you assign a port to any VLAN, because the ports initially belonged to VLAN 1.

To delete the VLAN, use the **clear vlan** command, but the ports will remain a part of that VLAN and be deactivated because they no longer belong to any VLAN. The switch will display a warning and give you the opportunity to cancel the current request.

```
CatosSwitch> (enable) clear vlan 3
This command will deactivate all ports on vlan 3
in the entire management domain.
Do you want to continue(y/n) [n]?y
Vlan 3 deleted

CatosSwitch> (enable) show vlan
VLAN Name                             Status    IfIndex Mod/Ports, Vlans
---- -------------------------------- --------- ------- -------------------------
1    default                          active    5       1/1-2
                                                        3/16-48
                                                        4/1-16
2    cisco_vlan_2                     active    75      3/1-12
1002 fddi-default                     active    6
1003 token-ring-default               active    9
1004 fddinet-default                  active    7
1005 trnet-default                    active    8


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
1    enet  100001     1500  -      -      -      -    -        0      0
2    enet  100002     1500  -      -      -      -    -        0      0
1002 fddi  101002     1500  -      -      -      -    -        0      0
1003 trcrf 101003     1500  -      -      -      -    -        0      0
1004 fdnet 101004     1500  -      -      -      -    -        0      0
1005 trbrf 101005     1500  -      -      -      IBM  -        0      0

(Output Suppressed...)
```

Note: Ports 3/13−3/15 are not displayed in the above **show vlan** command, as they are deactivated by the removal of VLAN 3. Unless you add them back in any other VLAN, they will not be displayed.

Troubleshooting Tips

Below are troubleshooting tips for common problems that you may encounter while creating VLANs on Catalyst switches running CatOS:

- If you create a VLAN when there is no VTP domain name defined, you will receive the error message below:

  ```
  CatosSwitch> (enable) set vlan 2
  Cannot add/modify VLANs on a VTP server without a domain name.
  CatosSwitch> (enable)
  ```

  To correct this, create a VTP domain name on the switch, as shown in the configuration section

- If you create a VLAN on a switch that is in VTP client mode, you will receive the following error message:

```
CatosSwitch> (enable) set vlan 2
Cannot add/modify VLANs on a VTP client.
CatosSwitch> (enable)
```

Note: A switch is only allowed to create VLANs if it is in VTP server or VTP transparent modes. For details on VTP, please refer to the Understanding and Configuring VLAN Trunk Protocol (VTP) document.

- Ports are in "inactive" state when the **show port <*mod/port*>** command is issued. This means that the VLAN to which the ports originally belonged was deleted, usually because of VTP. You can either re−create that VLAN or correct the VTP configuration so that the VLAN is re−established in the VTP Domain. Sample **show port <*mod/port*>** command output is shown below:

```
CatosSwitch> (enable) show port 3/1
Port  Name               Status     Vlan       Duplex Speed Type
----- ------------------ ---------- ---------- ------ ----- ------------
 3/1                     inactive   2            auto  auto 10/100BaseTX

Port  AuxiliaryVlan AuxVlan-Status     InlinePowered     PowerAllocated
                                    Admin Oper   Detected mWatt mA @42V
----- ------------- -------------- ----- ------ -------- ----- --------
 3/1  none          none           -     -      -        -     -

(Output Suppressed...)
```

If you have the output of a **show port** command from your Cisco device, you can use to display potential issues and fixes. To use , you must be a registered user, be logged in, and have JavaScript enabled. You can use Output Interpreter to display potential issues and fixes. To use Output Interpreter, you must be a registered user, be logged in, and have JavaScript enabled.

```
CatosSwitch> (enable) show vlan 2
VLAN Name                             Status    IfIndex Mod/Ports, Vlans
---- -------------------------------- --------- ------- ------------------------
Unable to access VTP Vlan 2 information.


VLAN Type  SAID       MTU   Parent RingNo BrdgNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ ------ ---- -------- ------ ------
Unable to access VTP Vlan 2 information.


VLAN DynCreated  RSPAN
---- ---------- --------
Unable to access VTP Vlan 2 information.


VLAN AREHops STEHops Backup CRF 1q VLAN
---- ------- ------- ---------- -------
```

Configuring the VLAN on Catalyst 2900/3500 XL, 2950, and 3550 Series Switches

Note: Depending on the model of the switch that you have, you may see different out put of certain commands displayed in this section.

Step 1 Before you create VLANs, you must decide whether to useVTP in your network. Using VTP, you can

make configuration changes centrally on a single switch, and have those changes automatically communicated to all the other switches in the network. The default VTP mode on the switches mentioned in this section is the server mode.

For details on VTP, refer to Understanding and Configuring VLAN Trunk Protocol

You can check the VTP status on the XL Series Switches, by using the **show vtp status** command.

```
3524XL#show vtp status
VTP Version                     : 2
Configuration Revision          : 0
Maximum VLANs supported locally : 254
Number of existing VLANs        : 5
VTP Operating Mode              : Server!-- This is the default mode
VTP Domain Name                 :
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xBF 0x86 0x94 0x45 0xFC 0xDF 0xB5 0x70
Configuration last modified by 0.0.0.0 at 0-0-00 00:00:00
```

Step 2 By default, there is only a single VLAN for all ports, and this VLAN is called the *default*. VLAN1 cannot be renamed or deleted. You can run **show vlan** command to check the VLAN information.

```
3524XL#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4,
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8,
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12,
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16,
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20,
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24,
                                                Gi0/1, Gi0/2
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
1002 fddi  101002     1500  -      -      -        -    -        1      1003
1003 tr    101003     1500  1005   0      -        -    srb      1      1002
1004 fdnet 101004     1500  -      -      1        IBM  -        0      0
1005 trnet 101005     1500  -      -      1        IBM  -        0      0
3524XL#
```

Use the following set of commands in the privileged mode to create another VLAN:

```
3524XL#vlan database!-- You have to enter into vlan database, to configure any VLAN
3524XL(vlan)#vtp server
Device mode already VTP SERVER.
!-- You may skip the above command, if the switch is already in server mode,
and you want the switch to be in server mode
```

Note: A switch is only allowed to create VLANs if it is in VTP server or VTP transparent modes. For details on VTP, please refer to the Understanding and Configuring VLAN Trunk Protocol (VTP) document.

```
3524XL(vlan)#vlan ?
```

```
  <1-1005>  ISL VLAN index

3524XL(vlan)#vlan 2 ?
  are         Maximum number of All Route Explorer hops for this VLAN
  backupcrf   Backup CRF mode of the VLAN
  bridge      Bridging characteristics of the VLAN
  media       Media type of the VLAN
  mtu         VLAN Maximum Transmission Unit
  name        Ascii name of the VLAN
  parent      ID number of the Parent VLAN of FDDI or Token Ring type VLANs
  ring        Ring number of FDDI or Token Ring type VLANs
  said        IEEE 802.10 SAID
  state       Operational state of the VLAN
  ste         Maximum number of Spanning Tree Explorer hops for this VLAN
  stp         Spanning tree characteristics of the VLAN
  tb-vlan1    ID number of the first translational VLAN for this VLAN (or zero
              if none)
  tb-vlan2    ID number of the second translational VLAN for this VLAN (or zero
              if none)
  <cr>

3524XL(vlan)#vlan 2 name ?
  WORD  The ASCII name for the VLAN

3524XL(vlan)#vlan 2 name cisco_vlan_2
VLAN 2 added:
    Name: cisco_vlan_2
3524XL(vlan)#exit!-- You have to exit from the VLAN database, for the changes to be commit
APPLY completed.
Exiting....
3524XL#
```

Step 3 Make sure that the VLAN is created by running the **show vlan** command.

```
3524XL#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/3, Fa0/4,
                                                Fa0/5, Fa0/6, Fa0/7, Fa0/8,
                                                Fa0/9, Fa0/10, Fa0/11, Fa0/12,
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16,
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20,
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24,
                                                Gi0/1, Gi0/2
2    cisco_vlan_2                     active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
2    enet  100002     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        1      1003
1003 tr    101003     1500  1005   0      -        -    srb      1      1002
1004 fdnet 101004     1500  -      -      1        IBM  -        0      0
1005 trnet 101005     1500  -      -      1        IBM  -        0      0
```

Step 4 You may want to add the ports (interfaces) in the newly created VLAN. You have to go to **interface configuration mode** for each of the interfaces that you want to add into the new VLAN. Use the following set of commands in the privileged mode to add a particular interface in the VLAN.

```
3524XL#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3524XL(config)#interface fastEthernet 0/2
3524XL(config-if)#switchport access ?
  vlan  Set VLAN when interface is in access mode

3524XL(config-if)#switchport access vlan ?
  <1-1001>  VLAN ID of the VLAN when this port is in access mode
  dynamic   When in access mode, this interfaces VLAN is controlled by VMPS

3524XL(config-if)#switchport access vlan 2!-- Assigning interface fa0/2 to vlan 2
3524XL(config-if)#exit
3524XL(config)#interface fastEthernet 0/3
3524XL(config-if)#switchport access vlan 2!-- Assigning interface fa0/3 to vlan 2
3524XL(config-if)#end
3524XL#
00:55:26: %SYS-5-CONFIG_I: Configured from console by console
3524XL#wr mem!-- Saving the configuration
Building configuration...
```

Step 5 Verify VLAN configuration by using **show vlan** command.

```
3524XL#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/4, Fa0/5, Fa0/6,
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10,
                                                Fa0/11, Fa0/12, Fa0/13, Fa0/14,
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18,
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22,
                                                Fa0/23, Fa0/24, Gi0/1, Gi0/2
2    cisco_vlan_2                     active    Fa0/2, Fa0/3
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
2    enet  100002     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        1      1003
1003 tr    101003     1500  1005   0      -        -    srb      1      1002
1004 fdnet 101004     1500  -      -      1        IBM  -        0      0
1005 trnet 101005     1500  -      -      1        IBM  -        0      0
```

To remove ports from the VLAN, use the **no switchport access vlan <*vlan#*>** command in the interface configuration mode. Once the port is removed from the VLAN that is not VLAN 1 (the default VLAN), that port is automatically added back to the default VLAN.

For example, if you want to remove interface Fa0/2 from **cisco_vlan_2 (VLAN 2)**, use the following set of commands in the privileged mode:

```
3524XL#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
3524XL(config)#interface fastEthernet 0/2
3524XL(config-if)#no switchport access vlan 2!-- Removing interface fa0/2 from vlan 2
3524XL(config-if)#end
3524XL#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/4, Fa0/5,
```

```
                                                  !-- Note that Fa0/2 is added back,
                                                  to the default vlan
                                                  Fa0/6, Fa0/7, Fa0/8, Fa0/9,
                                                  Fa0/10, Fa0/11, Fa0/12, Fa0/13,
                                                  Fa0/14, Fa0/15, Fa0/16, Fa0/17,
                                                  Fa0/18, Fa0/19, Fa0/20, Fa0/21,
                                                  Fa0/22, Fa0/23, Fa0/24, Gi0/1,
                                                  Gi0/2
2    cisco_vlan_2                    active    Fa0/3
1002 fddi-default                    active
1003 token-ring-default              active
1004 fddinet-default                 active
1005 trnet-default                   active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        1002   1003
2    enet  100002     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        1      1003
1003 tr    101003     1500  1005   0      -        -    srb      1      1002
1004 fdnet 101004     1500  -      -      1        IBM  -        0      0
1005 trnet 101005     1500  -      -      1        IBM  -        0      0
3524XL#
```

To delete the VLAN, use **no vlan <*vlan#*>** command from the **vlan database mode**. Interfaces that were in that VLAN, will remain a part of that VLAN and be deactivated since they no longer belong to any VLAN.

For example, if you want to delete **cisco_vlan_2** from the switch, use the following set of commands in the privileged mode:

```
3524XL#vlan database!-- Entering the vlan database mode
3524XL(vlan)#no vlan 2!-- Removing the VLAN from the database
Deleting VLAN 2...
3524XL(vlan)#exit
APPLY completed.
Exiting....
3524XL#show vlan
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/1, Fa0/2, Fa0/4, Fa0/5,
                                                Fa0/6, Fa0/7, Fa0/8, Fa0/9,
                                                Fa0/10, Fa0/11, Fa0/12, Fa0/13,
                                                Fa0/14, Fa0/15, Fa0/16, Fa0/17,
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21,
                                                Fa0/22, Fa0/23, Fa0/24, Gi0/1,
                                                Gi0/2
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

(Output Suppressed...)
```

Notice that port Fa0/3 is not displayed in the above **show vlan** command, as it is deactivated by the removal of VLAN 2. Unless you add it back in any other VLAN, it will not be displayed noruseable.

```
3524XL#show interfaces fastEthernet 0/3
FastEthernet0/3 is down, line protocol is down

(Output Suppressed...)
```

To make the interface usable, you have to make sure that it belongs to any VLAN. In the above case, you have to add interface Fa0/3 in the default vlan (VLAN1), to make this interface useable.

Note: In the case of Catalyst 3550 switches, you can still use the interface with out adding it to a VLAN, if you make that interface a L3 interface. For further details on L3 interfaces on the Catalyst 3550 Switches, refer to the *Configuring Layer 3 Interfaces* section of Configuring Interface Characteristics. You may wish to use your browser's find feature to locate this section.

Configuring Multi−VLAN Port on Catalyst 2900 XL/3500 XL

The multi−VLAN port feature on the Catalyst 2900 XL/3500 XL switches allows for configuring a single port in two or more VLANs. This feature allows users from different VLANs to access a server or router without implementing inter−VLAN routing capability. A multi−VLAN port performs normal switching functions in all its assigned VLANs. VLAN traffic on the multi−VLAN port is not encapsulated as it is in trunking.

Note: The limitations of implementing multi−VLAN port features are listed below.

- You cannot configure a multi−VLAN port when a trunk is configured on the switch. You must connect the multi−VLAN port only to a router or server. The switch automatically transitions to VTP transparent mode when the multi−VLAN port feature is enabled, making the VTP disabled. No VTP configuration is required.

- The multi−VLAN port feature is supported only on the Catalyst 2900 XL/3500 XL series switches. This feature is not supported on the Catalyst 4000/5000/6000 series or any other Cisco Catalyst switches.

Step 1: In the lab, to show how the multi−VLAN port is configured, we have created three VLANs on a Catalyst 3512 XL switch, and one port of the switch is connected to an external router. The port connected to the router will be configured as a multi−VLAN port.

```
6-3512xl#show vlan
VLAN Name                             Status      Ports
---- -------------------------------- ---------   -------------------------------
1    default                          active      Fa0/1, Fa0/3, Fa0/6, Fa0/7,
                                                  Fa0/8, Fa0/9, Fa0/10, Fa0/11,
                                                  Fa0/12, Gi0/1, Gi0/2
2    VLAN0002                         active      Fa0/2, Fa0/4
3    VLAN0003                         active      Fa0/5
4    VLAN0004                         active
5    VLAN0005                         active
6    VLAN0006                         active
```

Here, port Fa0/1 is connected to external router. For more information on learning how to create VLANs and assigning ports to VLANs, refer to the Configuring the VLAN on Catalyst 2900/3500 XL, 2950, and 3550 Series Switches section of this document.

Step 2: Configure the Fa0/1 port in multi−VLAN mode, and add assigned VLANs to the multi−VLAN port.

```
6-3512xl#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
6-3512xl(config)#int fa0/1
6-3512xl(config-if)#switchport mode multi
!-- The port Fa0/1 mode is changed to multi.
6-3512xl(config-if)#switchport multi vlan ?
  LINE    VLAN IDs of VLANs to be used in multi-VLAN mode
```

```
  add     add VLANs to the current list
  remove  remove VLANs from the current list

6-3512xl(config-if)#switchport multi vlan 1,2,3
!-- VLANs 1, 2, and 3 are assigned to multi-VLAN port Fa0/1.

6-3512xl(config-if)#^Z

6-3512xl#
```

Step 3: Verify the configuration by issuing the **show vlan** and **show interface** <*interface-id*> **switchport** commands.

```
6-3512xl#show interface fa0/1 switchport
Name: Fa0/1
Operational Mode: multi
!-- The port is in multi-VLAN mode.
Administrative Trunking Encapsulation: isl
Operational Trunking Encapsulation: isl
Negotiation of Trunking: Disabled
Access Mode VLAN: 0 ((Inactive))
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: NONE
Pruning VLANs Enabled: NONE

Priority for untagged frames: 0

Override vlan tag priority: FALSE

Voice VLAN: none

Appliance trust: none

6-3512xl#


6-3512xl#show vlan brief
VLAN Name                             Status       Ports
---- -------------------------------- ---------    -------------------------------
1    default                          active       Fa0/1, Fa0/3, Fa0/6, Fa0/7,
                                                   Fa0/8, Fa0/9, Fa0/10, Fa0/1
                                                   Fa0/12, Gi0/1, Gi0/2
2    VLAN0002                         active       Fa0/1, Fa0/2, Fa0/4
!-- Note that previously, port Fa0/1 was only in VLAN 1, now it's assigned to multiple VLA
3    VLAN0003                         active       Fa0/1, Fa0/5
4    VLAN0004                         active
5    VLAN0005                         active
```

Step 4: You can verify the multi-VLAN operation by issuing the **ping** command from switch to router. The **ping** command should get a reply from the router every time the management IP address is assigned to any of the VLANs 1, 2, or 3.

```
6-3512xl#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
6-3512xl(config)#int vlan 1
6-3512xl(config-if)#ip address 192.168.1.1 255.255.255.0
!-- The management IP address is assigned to VLAN 1.
6-3512xl(config-if)#^Z
6-3512xl#
23:56:54: %SYS-5-CONFIG_I: Configured from console by console
6-3512xl#ping 192.168.1.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/3 ms
6-3512xl#ping 192.168.1.2
!-- You can ping the router from VLAN 1.

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
6-3512xl#



6-3512xl#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
6-3512xl(config)#int vlan 1
6-3512xl(config-if)#no ip address
!-- The management IP address is removed from VLAN 1.
6-3512xl(config-if)#shutdown

6-3512xl(config-if)#exit
6-3512xl(config)#int vlan 2
6-3512xl(config-subif)#ip address 192.168.1.1 255.255.255.0
6-3512xl(config-subif)#no shutdown
!-- The management IP address is assigned to VLAN 2.
6-3512xl(config-subif)#exit
6-3512xl(config)#exit
6-3512xl#ping 192.168.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
6-3512xl#ping 192.168.1.2
!-- We can ping the router from VLAN 2.

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/202/1004 ms
6-3512xl#



6-3512xl#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
6-3512xl(config)#int vlan 2
6-3512xl(config-subif)#no ip address
!-- The management IP address is removed from VLAN 2.
6-3512xl(config-subif)#shutdown
6-3512xl(config-subif)#exit
6-3512xl(config)#int vlan 3
6-3512xl(config-subif)#ip address 192.168.1.1 255.255.255.0
6-3512xl(config-subif)#no shut
!-- The management IP address is assigned to VLAN 3.
6-3512xl(config-subif)#exit
6-3512xl(config)#exit

6-3512xl#ping 192.168.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.1, timeout is 2 seconds:
```

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms
6-3512xl#ping 192.168.1.2
!-- You can ping the router from VLAN 3.

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/205/1004 ms
6-3512xl#
```

Tools Information

For additional resources, refer to Cisco TAC Tools for LAN Technologies.

Related Information

- **Configuring InterVLAN Routing Using an Internal Router (Layer 3 Card) on Catalyst 5000 and 6000 Switches Running CatOS**
- **Configuring InterVLAN Routing and ISL/802.1Q Trunking on a Catalyst 2900 XL/3500 XL/2950 Switch Using An External Router**
- **Catalyst 2900 XL/3500 XL, Cisco IOS Desktop Switching Command Reference**
- **Catalyst 4000, 5000, 6000 Family Command Reference Index (5.5)**
- **Understanding and Configuring VLAN Trunk Protocol (VTP)**
- **LAN Technologies Technical Tips**
- **LAN Technologies Top Issues**

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