

Comparing Layer 2 Operations in CatOS and Cisco IOS System Software on the Catalyst 6500/6000

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Introduction

This document familiarizes users of Catalyst OS (CatOS) with the Layer 2 (L2) configurations that Cisco IOS® System Software uses. This document covers the similarities and differences between CatOS and Cisco IOS Software for commands and concepts such as ports/interfaces, trunks, channels, VLANs, and Virtual Trunk Protocol (VTP). The document provides a [CatOS/Cisco IOS Software Command Matrix](#) for quick reference with regard to the most popular commands.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to [Cisco Technical Tips Conventions](#) for more information on document conventions.

Difference Between CatOS and Cisco IOS System Software

CatOS on the Supervisor Engine and Cisco IOS Software on the MSFC (Hybrid): A CatOS image can be used as the system software to run the Supervisor Engine on Catalyst 6500/6000 switches. If the optional MSFC is installed, a separate Cisco IOS Software image is used to run the MSFC.

Cisco IOS Software on both the Supervisor Engine and MSFC (Native): A single Cisco IOS Software image can be used as the system software to run both the Supervisor Engine and MSFC on Catalyst 6500/6000 switches.

Note: For more information, refer to the document [Comparison of the Cisco Catalyst and Cisco IOS Operating Systems for the Cisco Catalyst 6500 Series Switch](#).

Catalyst 6500/6000 CatOS and Cisco IOS Software Images

Catalyst 6500/6000 switches have the option to run one of two types of software.

CatOS: This implementation is logically equivalent to a Catalyst 5500/5000 series switch with a Route Switch Module (RSM). When you run in CatOS mode, there are two separate software images. The MSFC runs a traditional Cisco IOS Software image, and the Supervisor Engine runs the traditional CatOS. Each device has its own configuration file.

Cisco IOS Software: This implementation provides a single, "router-like" interface. The division between the router (which has the name Route Processor [RP]) and switch Supervisor Engine (which has the name Switch Processor [SP]) is transparent to the user. There is a single console connection, configuration file, and software image.

Note: You always need an MSFC1 boot image to allow the MSFC1 to load properly. The boot image is necessary for hardware support, and the boot image provides a backup for emergency recovery situations. The software image actually loads the necessary software for full functionality of the router.

A Policy Feature Card (PFC) is necessary in addition to an MSFC.

Understand Software Image Name Conventions for CatOS and Cisco IOS Software

In CatOS, the switch Supervisor Engine and the MSFC run separate software images.

With reference to the Supervisor Engine, there are two different image types: one for Supervisor Engine Is and the other one for Supervisor Engine IIs. The numeral that follows the *cat6000-sup* prefix denotes the difference in the images.

If a **2** follows the *cat6000-sup* prefix, the image is for the Catalyst Supervisor Engine II. If a **720** follows the *cat6000-sup* prefix, the image is for the Catalyst Supervisor Engine 720. If neither a **2** nor **720** follows the *cat6000-sup* prefix, the image is for the Catalyst Supervisor Engine I. So, for example, a file with the name "cat6000-sup.6-2-3.bin" is for the Supervisor Engine I. A file with the name "cat6000-sup2.6-2-3.bin" is for the Supervisor Engine II. To download these images, refer to [Software Download - Catalyst 6500/6000 CatOS System Software](#) ([registered](#) customers only) .

When you run CatOS with Cisco IOS Software on the MSFC1, MSFC2, or MSFC3, each MSFC type runs its own separate image. The [Download Software Area](#) ([registered](#) customers only) now incorporates these images. To download the image for the MSFC1, MSFC2, or MSFC3, go to the [Cisco Software Download](#) page.

Cisco IOS System Software runs a combined software image for both the Supervisor Engine and MSFC daughter card. For the user, there is only one image to load into Flash. The type of Supervisor Engine

and MSFC installation categorizes each image. The image categories in the [Download Software Area](#) ([registered](#) customers only) are:

- Supervisor Engine 720/MSFC3 (CAT6000-SUP720/MSFC3)
- Supervisor Engine 2/MSFC2 (CAT6000-SUP2/MSFC2)
- Supervisor Engine 1/MSFC2 (CAT6000-SUP1/MSFC2)
- Supervisor Engine 1/MSFC1 (CAT6000-SUP1/MSFC1)

To download Cisco IOS System Software images, refer to [Software Download - Catalyst 6500/6000 Cisco IOS System Software](#) ([registered](#) customers only) .

Note: A Supervisor Engine II must use an MSFC2 daughter card; a Supervisor Engine II cannot use the original MSFC daughter card.

To determine which image currently runs, issue the **show version** command.

Note: In Hybrid mode, issue the **show version** command on the respective modules to determine the current image they are running.

For example, here, the **show version** command indicates a Catalyst 6500 with MSFC2 that runs CatOS on the Supervisor Engine and Cisco IOS Software on the MSFC.

```
Hybrid_Cat6500>(enable) show version
WS-C6509 Software, Version NmpSW: 7.6(4)
Copyright (c) 1995-2003 by Cisco Systems
NMP S/W compiled on Nov  4 2003, 19:22:09

System Bootstrap Version: 5.3(1)
System Boot Image File is 'bootflash:cat6000-supk8.7-6-4.
bin'
System Configuration register is 0x2102

Hardware Version: 2.0  Model: WS-C6509  Serial #:
SCA043500S2
PS1  Module: WS-CAC-1300W      Serial #: SON04340836
PS2  Module: WS-CAC-1300W      Serial #: SNI05470791

Mod Port Model                Serial #      Versions
```

```

-----
-----
1   2   WS-X6K-SUP1A-2GE   SAD04500AFW Hw : 7.4
                                   Fw : 5.3(2)
                                   Fw1: 5.4(2)
                                   Sw : 7.6(4)
                                   Sw1: 7.6(4)
      WS-X6K-SUP1A-2GE   SAD04500AFW Hw : 7.4
                                   Sw :
2   2   WS-X6K-SUP1A-2GE   SAL0549F477 Hw : 7.1
                                   Fw : 5.3(1)
                                   Fw1: 5.4(2)
                                   Sw : 7.6(4)
                                   Sw1: 7.6(4)
      WS-X6K-SUP1A-2GE   SAL0549F477 Hw : 7.1
                                   Sw :
3   48  WS-X6148-GE-TX     SAD0746052K Hw : 4.0
                                   Fw : 7.2(1)
                                   Sw : 7.6(4)
4   48  WS-X6248-RJ-45     SAD04281CZY Hw : 1.2
                                   Fw : 5.1(1)CSX
                                   Sw : 7.6(4)
5   48  WS-X6248-RJ-45     SAD042608NZ Hw : 1.2
                                   Fw : 5.1(1)CSX
                                   Sw : 7.6(4)
6   48  WS-X6248-RJ-45     SAD04170CG9 Hw : 1.2
                                   Fw : 5.1(1)CSX
                                   Sw : 7.6(4)
7   48  WS-X6248-RJ-45     SAD04270N9U Hw : 1.2
                                   Fw : 5.1(1)CSX
                                   Sw : 7.6(4)
15  1   WS-F6K-MSFC2       SAD04520C65 Hw : 1.7
                                   Fw : 12.1(19)E1
                                   Sw : 12.1(19)E1
16  1   WS-F6K-MSFC2       SAL0548F2TE Hw : 2.0
                                   Fw : 12.1(19)E1
                                   Sw : 12.1(19)E1

```

```

          DRAM          FLASH          NVRAM
Module Total  Used  Free  Total  Used  Free
Total Used  Free
-----
-----

```

2 130944K 50017K 80927K 16384K 10857K 5527K
512K 389K 123K

Uptime is 142 days, 4 hours, 27 minutes

Default System Differences Between the CatOS and Cisco IOS Software

Features	CatOS	Cisco IOS Software
Configuration file	Two configuration files: one for the Supervisor Engine (NMP ¹) and one for the MSFC	One configuration file
Software image	Two images: one for the Supervisor Engine and one for the MSFC	One software image; an MSFC boot image is also required to allow the MSFC to load properly
Default port mode	Every port is an L2 switched port	Every port is an L3 ² routed port (interface)
Default port status	Every port is enabled	Every port (interface) is in the shutdown state
Configuration commands format	The command keyword set precedes each configuration command	Cisco IOS command structure with global- and interface-level commands

Configuration mode	No configuration mode (set , clear , and show commands)	The commands configure terminal and VLAN database activate configuration modes
Remove/change the configuration	Via use of the clear , set , and/or enable/disable commands	Same as Cisco IOS command structure; keyword no negates a command

¹ NMP = Network Management Processor

² L3 = Layer 3

Understand Interfaces in Cisco IOS System Software

Interface (Port) Modes in Cisco IOS Software

You refer to ports in Cisco IOS Software as interfaces. There are two types of interface modes in Cisco IOS Software:

- L3 routed interface
- L2 switch interface

Note: The default is an L3 routed interface.

Configure L2 Ethernet Interfaces

To make a port/interface an L2 switch interface, add the **switchport** command under the interface, as this example shows:

```
Cat6500# show running-config interface fastethernet 5/10
Building configuration...
Current configuration:
!
```

```
interface FastEthernet5/10
no ip address
switchport
end
```

The default interface configuration for an L2 switch port is different than in CatOS. For example, when a port has an L2 port configuration, the trunk mode is **desirable** instead of **auto**. The **show interface interface switchport** command provides details on the current configuration of an L2 switch port. Here is an example:

```
Cat6500# show interfaces fastethernet 5/10 switchport
Name: Fa5/10
Switchport: Enabled
Administrative Mode: dynamic desirable
Operational Mode: down
Administrative Trunking Encapsulation: negotiate
Negotiation of Trunking: On
Access Mode VLAN: 1 ( default)
Trunking Native Mode VLAN: 1 (default)
Trunking VLANs Enabled: ALL
Pruning VLANs Enabled: 2-1001
```

There are three main L2 switch port modes in Cisco IOS Software:

- **Access:** Sets the interface to nontrunking mode.
- **Dynamic:** Sets the interface to dynamically negotiate for access or trunk mode. Two options for this setting are:
 - **Desirable:** This configuration allows the port to become trunk if the neighbor device has a trunk configuration in the **desirable** or **auto** mode. Desirable mode is the default mode when a port has a switch port configuration.
 - **Auto:** This configuration allows the port to become trunk if the other neighbor has a trunk configuration in the **desirable** mode.
- **Trunk:** Sets the interface to permanent trunk mode.

Port Configuration and Status CatOS/Cisco IOS Command Matrix

Function	CatOS

<p>To enable PortFast</p>	<p>CatOS (enable) set spantree portfast 4/1 enable</p> <p>Warning: Spantree port fast start should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc. to a fast start port can cause temporary spanning tree loops. Use with caution.</p> <p>Spantree port 4/1 fast start enabled.</p>
<p>To configure port for host access. This command enables PortFast and disables trunking and channeling in CatOS.</p>	<p>CatOS (enable) set port host 4/2 Port(s) 4/2 channel mode set to off.</p> <p>Warning: Spantree port fast start should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc. to a fast start port can cause temporary spanning tree loops. Use with caution.</p> <p>Spantree port 4/2 fast start enabled. Port(s) 4/2 trunk mode set to off. CatOS (enable)</p>
<p>To display the port status</p>	<p>show port</p> <p>show port <i>mod</i></p> <p>show port <i>mod/port</i></p> <p>show port counters</p> <p>show port counters <i>mod/port</i></p>

<p>Function</p>	<p>Cisco IOS Software</p>
------------------------	----------------------------------

<p>To enable PortFast</p>	<pre> CiscoIOS(config)# interface fastethernet 4/2 CiscoIOS(config-if)# spanning-tree portfast Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc. to this interface when portfast is enabled can cause temporary spanning tree loops. Use with CAUTION Portfast has been configured on FastEthernet4/2 but will only have effect when the interface is in a non-trunking mode. CiscoIOS(config-if)# ^Z CiscoIOS# </pre>
<p>To configure port for host access. This command enables PortFast and disables trunking and channeling in CatOS.</p>	<pre> CiscoIOS(config)# interface fastethernet 4/2 CiscoIOS(config-if)# switchport CiscoIOS(config-if)# switchport mode access CiscoIOS(config-if)# spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc. to this interface when portfast is enabled, can cause temporary spanning tree loops. Use with CAUTION %Portfast has been configured on FastEthernet4/2 but will only have effect when the interface is in a non-trunking mode. CiscoIOS(config-if)# ^Z CiscoIOS# </pre>

To display
the port
status

```
show interface status
```

```
show interface status module mod
```

```
show interface status errordisabled
```

```
show interface counters error module mod
```

Understand the Use of the range Command in Cisco IOS Software

Even when a switch runs Cisco IOS Software, there is still the potential to have a large number of interfaces. Therefore, to aid in the quick configuration of multiple ports, Cisco IOS Software allows you to configure a range of interfaces simultaneously as in CatOS. If you issue the **range** command, you can configure many interfaces with the same configuration quickly.

```
CiscoIOS(config)# interface range gigabitethernet 1/1 -2,  
fastethernet 4/1 -24
```

Note: In the syntax of this command, there is a space between the first interface range and the hyphen. Syntax is important and must be absolutely accurate. If a space is not in place, the command-line interface (CLI) returns a syntax error.

These are examples of incorrect usage of the **range** command:

```
CiscoIOS(config)# interface range gigabitethernet 1/1-2,  
fastethernet 4/1-24  
^
```

```
% Invalid input detected at '^' marker.
```

```
CiscoIOS(config)# interface range gigabitethernet 1/1 -2,  
fastethernet 4/1-24  
^
```

```
% Invalid input detected at '^' marker.
```

```
CiscoIOS(config)# interface range gigabitethernet 1/1 -2,  
fastethernet 4/1 -24
```

This example sets the port from 4/2-8 in VLAN 2:

```
NativeIOS(config)# interface range fastethernet 4/2 -8  
CiscoIOS(config-if)# switchport  
CiscoIOS(config-if)# switchport access vlan 2  
CiscoIOS(config-if)# no shut  
CiscoIOS(config-if)# ^Z  
CiscoIOS# show interface
```

After this use of the **range** command, the configuration appears as this:

```
interface FastEthernet4/4  
no ip address  
switchport  
switchport access vlan 2  
!  
interface FastEthernet4/5  
no ip address  
switchport  
switchport access vlan 2  
!  
interface FastEthernet4/6  
no ip address  
switchport  
switchport access vlan 2  
!  
interface FastEthernet4/7  
no ip address  
switchport  
switchport access vlan 2  
!  
interface FastEthernet4/8  
no ip address  
switchport  
switchport access vlan 2  
!  
interface FastEthernet4/9  
no ip address  
shutdown
```

Cisco IOS Software Configurations

Configure Trunks in Cisco IOS Software

Cisco IOS Software supports both Inter-Switch Link Protocol (ISL) and IEEE 802.1Q (dot1q) trunking modes. Different options for interface configurations are available, as the section [Understand Interfaces in Cisco IOS System Software](#) discusses. Trunking works in exactly the same way as in CatOS, except for the default setting in Cisco IOS Software, which is **desirable** rather than **auto**.

Function	CatOS
To enable ISL trunk	CatOS (enable) set trunk 4/1 on isl Port(s) 4/1 trunk mode set to on. Port(s) 4/1 trunk type set to isl.
To enable dot1q trunk	CatOS (enable) set trunk 4/1 on dot1q Port(s) 4/1 trunk mode set to on. Port(s) 4/1 trunk type set to dot1q CatOS (enable) set vlan 2 4/1 VLAN 2 modified. VLAN 1 modified. VLAN Mod/Ports ----- 2 1/1 4/1 Note: In the case of dot1q, it is very important that the native VLAN matches across the trunk link. Use the set vlan <i>vlan-id</i> <i>mod/port</i> command in CatOS to set the native VLAN for the trunk.
To change trunk mode	CatOS (enable) set trunk <i>mod/port</i> {on off desirable auto nonegotiate} [<i>vlangs</i>] [<i>isl</i> <i>dot1q</i> <i>negotiate</i>]
To display trunking status	show trunk show trunk <i>mod</i> show port <i>mod/port</i>

Function	Cisco IOS Software
To enable ISL trunk	<pre> CiscoIOS# configure terminal Enter configuration commands, one per line. End with CNTL/Z. CiscoIOS(config)# interface fastethernet 4/1 CiscoIOS(config-if)# switchport CiscoIOS(config-if)# switchport trunk encapsulation isl CiscoIOS(config-if)# switchport mode trunk 3d22h: %DTP-SP-5-TRUNKPORTON: Port Fa4/1 has become isl CiscoIOS(config-if)# ^Z CiscoIOS# </pre>
To enable dot1q trunk	<pre> CiscoIOS# configure terminal Enter configuration commands, one per line. End with CNTL/Z. CiscoIOS(config)# interface fastethernet 4/1 CiscoIOS(config-if)# switchport CiscoIOS(config-if)# switchport trunk encapsulation dot1q CiscoIOS(config-if)# switchport mode trunk 3d22h: %DTP-SP-5-TRUNKPORTON: Port Fa4/1 has become dot1q CiscoIOS(config-if)# switchport trunk native vlan 2 CiscoIOS(config-if)# ^Z CiscoIOS# </pre>
To change trunk mode	<pre> CiscoIOS(config-if)# switchport mode {access trunk multi dynamic {auto desirable}} </pre>
To display trunking status	<pre> show interfaces trunk show interfaces trunk module <i>number</i> show interfaces <i>interface-type</i> mod/port show interfaces status </pre>

There are several ways to verify trunk information in Cisco IOS Software.

Note: A routed port is not an L2 trunked port.

The **show interfaces trunk** command displays all the interfaces that currently trunk. This command does not display ports that have a configuration to trunk but do not actively trunk:

```
Switch# show interfaces trunk
Port Mode          Encapsulation Status    Native vlan
Po41 desirable n-isl      trunking 1
Port Vlans allowed on trunk
Po41 1-1005
Port Vlans allowed and active in management domain
Po41 1-6,1002-1005
Port Vlans in spanning tree forwarding state and not pruned
Po41 1-6,1002-1005
```

The **show interfaces trunk module *number*** command shows all the interfaces on the specified module, regardless of trunk status.

```
Switch# show interfaces trunk module 4
Port  Mode          Encapsulation Status      Native vlan
Fa4/1 desirable n-isl      trunk-inbndl 1 (Po41)
Fa4/2 desirable n-isl      trunk-inbndl 1 (Po41)
Fa4/3 desirable n-isl      trunk-inbndl 1 (Po41)
Fa4/4 desirable n-isl      trunk-inbndl 1 (Po41)
Fa4/5 desirable negotiate not-trunking 1
Fa4/6 desirable negotiate not-trunking 1
Fa4/7 desirable negotiate not-trunking 1
Fa4/8 desirable negotiate not-trunking 1
Fa4/9 desirable negotiate not-trunking 1
Fa4/10 routed    negotiate  routed      1
Fa4/11 desirable negotiate not-trunking 1
Fa4/12 desirable negotiate not-trunking 1
Fa4/13 desirable negotiate not-trunking 1
Fa4/14 desirable negotiate not-trunking 1
Fa4/15 desirable negotiate not-trunking 1
Fa4/16 desirable negotiate not-trunking 1
Fa4/17 desirable negotiate not-trunking 1
```

You can use the **show interfaces *interface-type mod/port* trunk** command to check the trunking status

of a specific interface without the need to scroll through multiple screens.

```
Switch# show interfaces fastethernet 4/1 trunk
Port Mode Encapsulation Status Native vlan
Fa4/1 desirable n-isl trunk-inbndl 1 (Po41)
Port Vlans allowed on trunk
Fa4/1 1-1005
Port Vlans allowed and active in management domain
Fa4/1 1-6,1002-1005
Port Vlans in spanning tree forwarding state and not pruned
Fa4/1 1-6,1002-1005
```

The **show interfaces status** command provides a one-line display for each interface with the status and trunking state.

```
Switch# show interfaces status
```

Port Name	Status	Vlan	Duplex	Speed	Type
Gi1/1	connected	routed	full	1000	1000BaseSX
Gi1/2	connected	1	full	1000	1000BaseSX
Gi3/1	notconnect	routed	full	1000	missing
Gi3/2	notconnect	routed	full	1000	missing
Gi3/3	notconnect	routed	full	1000	1000BaseSX
Gi3/4	notconnect	routed	full	1000	1000BaseSX
Gi3/5	notconnect	routed	full	1000	1000BaseSX
Gi3/6	notconnect	routed	full	1000	1000BaseSX
Gi3/7	notconnect	routed	full	1000	1000BaseSX
Gi3/8	notconnect	routed	full	1000	1000BaseSX
Fa4/1	connected	trunk	full	100	100BaseFX MM
Fa4/2	connected	trunk	full	100	100BaseFX MM
Fa4/3	connected	trunk	full	100	100BaseFX MM
Fa4/4	connected	trunk	full	100	100BaseFX MM
Fa4/5	notconnect	1	full	100	100BaseFX MM
Fa4/6	notconnect	1	full	100	100BaseFX MM
Fa4/7	notconnect	2	full	100	100BaseFX MM
Fa4/8	notconnect	2	full	100	100BaseFX MM
Fa4/9	notconnect	1	full	100	100BaseFX MM
Fa4/10	notconnect	routed	full	100	100BaseFX MM
Fa4/11	notconnect	1	full	100	100BaseFX MM

Configure EtherChannels in Cisco IOS Software

You configure EtherChannels in Cisco IOS Software much differently than in CatOS. To enable EtherChannel on a group of ports in Cisco IOS Software requires the use of a port channel interface. If all conditions are valid for the group of ports, they form a port channel. By default, all interfaces have port channeling disabled, even when an interface has a switch port configuration.

To configure a group of interfaces to be part of an EtherChannel, you must issue the command **channel-group** *group-number* **mode** *channel-mode* under each interface individually. If you remove the **switchport** command from the configuration, all the commands that relate to that switch port no longer show in the configuration. However, the reconfiguration of the port as a switch port returns all the previous commands. As a result, the configuration and the unconfiguration of a port as a switch port does not clear the port channel group information.

Once you have created a channel group, you must issue all of the configuration on the port channel interface and not on the individual physical ports. Any commands that you issue on the port channel propagate to all the physical ports transparently. Commands that you issue on the physical interface of a channel member can remove the interface from the channel group.

Function	CatOS
To create the channel	CatOS (enable) set port channel 4/3-4 on Port(s) 4/3-4 are assigned to admin group 613. Port(s) 4/3-4 channel mode set to on. CatOS (enable)
To set the channel mode	CatOS (enable) set port channel <i>mod/port mode {on off desirable </i> auto} [silent non-silent]
To show the port channel status	show port channel show port channel <i>mod/port</i> show port channel <i>channel-group</i>

Function	Cisco IOS Software

To create the channel	<pre>CiscoIOS# configure terminal Enter configuration commands, one per line. End with CNTL/Z. CiscoIOS(config)# interface port-channel 1 CiscoIOS(config-if)# exit CiscoIOS(config)# interface fastethernet 4/3 CiscoIOS(config-if)# channel-group 1 mode on CiscoIOS(config-if)# interface fastethernet 4/4 CiscoIOS(config-if)# channel-group 1 mode on CiscoIOS(config-if)#</pre>
To set the channel mode	<pre>CiscoIOS(config-if)# channel-group channel-group_number mode {on auto [non-silent] desirable [non-silent]}</pre>
To show the port channel status	<pre>show etherchannel show etherchannel channel-group show interfaces etherchannel show interfaces interface-type mod/port etherchannel</pre>

The **show etherchannel** command has various subcommands to display information about the configuration of the port channels.

The **show etherchannel channel-group summary** command gives the status of all the interfaces within the channel group configuration. This command is very useful to quickly find the interfaces that are supposed to belong to a channel group.

```
CiscoIOS# show etherchannel 256 summary
Flags: U - in use I - in port-channel S - suspended
D - down I - stand-alone d - default setting
Group Port-channel Ports
-----+-----
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
256   Po256(U)      Fa5/5(I) Fa5/6(I) Fa5/7(I) Fa5/8(I)
```

The **show interfaces etherchannel** command displays every interface that associates with a channel

group, regardless of the channel status.

```
CiscoIOS# show interfaces etherchannel
```

```
----
```

```
GigabitEthernet1/1:
```

```
Port state = EC-Enbld Up In-Bndl Usr-Config
```

```
Channel group = 254 Mode = Automatic Gcchange = 0
```

```
Port-channel = Po254 GC = 0x00FE0001
```

```
Port indx = 0 Load = 0x55
```

```
Flags: S - Device is sending Slow hello. C - Device is in  
Consistent state.
```

```
A - Device is in Auto mode. P - Device learns on physical  
port.
```

```
Timers: H - Hello timer is running. Q - Quit timer is  
running.
```

```
S - Switching timer is running. I - Interface timer is  
running.
```

```
Local information:
```

```
Hello Partner PAgP Learning Group
```

```
Port Flags State Timers Interval Count Priority
```

```
Method Ifindex
```

```
Gi1/1 SAC U6/S7 Q 30s 1 128
```

```
Any 56
```

```
Partner's information:
```

```
Partner Partner Partner Partner Group
```

```
Port Name Device ID Port Age
```

```
Flags Cap.
```

```
Gi1/1 69055180(STELLA) 0010.7bbe.50bb 3/4 12s SC 2
```

You can use the **show interfaces interface-type mod/port etherchannel** command to check the channel status of a specific interface without the need to scroll through multiple screens.

```
CiscoIOS# show interfaces fastethernet 5/5 etherchannel
```

```
Port state = EC-Enbld Up Cnt-bndl Sngl-port-Bndl Cnt-Bndl
```

```
Not-in-Bndl Usr-Config
```

```
Channel group = 256 Mode = Automatic Gcchange = 1
```

```
Port-channel = null GC = 0x11000002
```

```
Port indx = 0 Load = 0x00
```

```
Flags: S - Device is sending Slow hello. C - Device is in  
Consistent state.
```

```
A - Device is in Auto mode. P - Device learns on physical
```

port.

Timers: H - Hello timer is running. Q - Quit timer is running.

S - Switching timer is running. I - Interface timer is running.

Local information:

Hello Partner PAgP Learning Group

Port	Flags	State	Timers	Interval	Count	Priority	Method
Fa5/5	SAC	U6/S7	Q	30s	1	128	
Any	0						

Partner's information:

Partner	Partner	Partner	Partner	Group	
Port	Name	Device	ID	Port Age	Flags
Fa5/5	066549452(SINGHA)	00d0.bb3a.c0d9	4/17	29s	SC 2

Age of the port in the current state: 00h:30m:31s

Probable reason: pm - different in oper mode (1) with Fa5/8 (2)

The **show interfaces port-channel *channel-group* etherchannel** command displays the ports that are currently active members of the port channel.

```
CiscoIOS# show interfaces port-channel 256 etherchannel
```

```
Age of the Port-channel = 05h:52m:49s
```

```
Logical slot/port = 13/64 Number of ports = 2
```

```
GC = 0x01000001 HotStandBy port = null
```

```
Port state = Port-channel Ag-Inuse
```

```
Ports in the Port-channel:
```

Index	Load	Port	EC state	Configuration
1	55	Fa5/7	auto	user
0	AA	Fa5/8	auto	user

```
Time since last port bundled: 00h:46m:51s Fa5/7
```

```
Time since last port Un-bundled: 00h:46m:54s Fa5/8
```

Configure VLANs in Cisco IOS Software

The concept and functionality of VLANs are identical between Cisco IOS Software and CatOS. However, the configuration methods between the two implementations differ significantly. While **set** commands create VLANs in CatOS, the VLAN creation occurs via the **VLAN database** configuration mode in Cisco IOS Software.

Function	CatOS
To create a VLAN	CatOS (enable) set vlan 2 Vlan 2 configuration successful
To delete a VLAN	CatOS (enable) clear vlan 2 This command will deactivate all ports on vlan 2 Do you want to continue(y/n) [n]?y Vlan 2 deleted
To assign a port to the VLAN	CatOS (enable) set vlan 2 1/1 VLAN 2 modified. VLAN 10 modified. VLAN Mod/Ports ----- 2 1/1
To see the VLAN status	show vlan

Function	Cisco IOS Software

<p>To create a VLAN</p>	<pre>CiscoIOS# vlan database CiscoIOS(vlan)# vlan 2 VLAN 2 added: Name: VLAN0002 CiscoIOS(vlan)# exit APPLY completed. Exiting....</pre>
<p>To delete a VLAN</p>	<pre>NativeIOS# vlan database CiscoIOS(vlan)# no vlan 2 Deleting VLAN 2... CiscoIOS(vlan)# exit APPLY completed. Exiting....</pre>
<p>To assign a port to the VLAN</p>	<pre>CiscoIOS# configure terminal Enter configuration commands, one per line. End with CNTL/Z. CiscoIOS(config)# interface gigabitethernet2/2 CiscoIOS(config-if)# switchport CiscoIOS(config-if)# switchport access vlan 2 CiscoIOS(config-if)# ^Z CiscoIOS#</pre>
<p>To see the VLAN status</p>	<pre>show vlan</pre>

To check the status of the VLAN, use the **show vlan** command.

```
Router# show vlan
```

```
VLAN Name                               Status      Ports
```

```

-----
-----
1      default      active
2      VLAN0002     active
10     VLAN0010     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  -      -      -      -
-      0        0
2      enet    100002    1500  -      -      -      -
-      0        0
10     enet    100010    1500  -      -      -      -
-      0        0
1002   fddi    101002    1500  -      -      -      -
-      0        0
1003   tr       101003    1500  -      -      -      -
-      0        0
1004   fdnet   101004    1500  -      -      -      ieee
-      0        0
1005   trnet   101005    1500  -      -      -      ibm
-      0        0

Primary Secondary Type          Ports
-----
-----

```

Configure VTP in Cisco IOS Software

VTP is an L2 protocol that synchronizes VLAN databases in a VTP domain. At the addition, deletion, or modification of a VLAN within the same VTP domain, VTP synchronizes the VLAN database on all of the members within the same VTP domain. VTP pruning minimizes traffic on trunks through the reduction of unnecessary broadcast and multicast traffic for VLANs that do not need propagation.

In Cisco IOS Software, the VLAN database mode defines the VTP configuration. Changes to the VLAN database and VTP occur at the application of the VLAN data. This occurs when the user exits from the VLAN database configuration mode. The default Cisco IOS Software VTP configuration appears here:

Note: The default VTP mode is Server.

```
CiscoIOS# show vtp status
```

```
VTP Version : 2  
Configuration Revision : 0  
Maximum VLANs supported locally : 1005  
Number of existing VLANs : 6  
VTP Operating Mode : Server  
VTP Domain Name : null  
VTP Pruning Mode : Disabled  
VTP V2 Mode : Disabled  
VTP Traps Generation : Disabled  
MD5 digest : 0xE2 0x4F 0xC0 0xD6 0x94 0xBB 0x31 0x9A  
Configuration last modified by 0.0.0.0 at 6-27-01 02:04:20  
Local updater ID is 0.0.0.0 (no valid interface found)
```

Function	CatOS
To configure VTP	CatOS (enable) set vtp domain cisco VTP domain cisco modified
To change VTP mode	CatOS (enable) set vtp mode client VTP domain cisco modified CatOS (enable) set vtp mode server VTP domain cisco modified CatOS (enable) set vtp mode transparent VTP domain cisco modified

<p>To enable VTP pruning</p>	<pre>CatOS (enable) set vtp pruning enable</pre> <p>This command will enable the pruning function in the entire management domain.</p> <p>All devices in the management domain should be pruning-capable before enabling.</p> <p>Do you want to continue (y/n) [n]? y</p> <p>VTP domain cisco modified</p>
<p>To display the VTP configuration</p>	<pre>CatOS (enable) show vtp domain</pre>

Function	Cisco IOS Software
<p>To configure VTP</p>	<pre>CiscoIOS# vlan database CiscoIOS(vlan)# vtp domain cisco</pre> <p>Changing VTP domain name from null to cisco</p> <pre>CiscoIOS(vlan)# exit</pre> <p>APPLY completed. Exiting....</p>
<p>To change VTP mode</p>	<pre>CiscoIOS# vlan database CiscoIOS(vlan)# vtp client</pre> <p>Setting device to VTP CLIENT mode.</p> <pre>CiscoIOS(vlan)# vtp server</pre> <p>Setting device to VTP SERVER mode.</p> <pre>CiscoIOS(vlan)# vtp transparent</pre> <p>Setting device to VTP TRANSPARENT mode.</p>

	<pre>CiscoIOS(vlan)# exit APPLY completed. Exiting....</pre>
To enable VTP pruning	<pre>CiscoIOS# vlan database CiscoIOS(vlan)# vtp pruning Pruning switched ON CiscoIOS(vlan)# exit APPLY completed.</pre>
To display the VTP configuration	<pre>CiscoIOS# show vtp status</pre>

CatOS/Cisco IOS Software Command Matrix

This table is a brief list of CatOS commands and the Cisco IOS Software equivalent of the commands. This table is useful for quick reference for migration to Cisco IOS Software from CatOS. The table is an abbreviated list of commands that have frequent use. The table does not list all the parameters for each command. Refer to the [Catalyst 6500 Series Cisco IOS Command Reference, 12.2SX](#) for complete command syntax and parameters.

Comments in this section provide assistance with specific commands. The comments appear in italics.

CatOS Command	Cisco IOS Software Command
clear vlan <i>vlan</i>	no vlan <i>This command is a VLAN database command.</i>

<p>set cam agingtime</p>	<p>mac-address-table aging-time</p> <p><i>This command sets MAC address aging time per VLAN.</i></p>
<p>set cam set cam {static permanent}</p>	<p>mac-address-table static</p> <p><i>All static entries are also permanent.</i></p>
<p>set errdisable-timeout interval</p>	<p>errdisable recovery interval 30-86400</p> <p><i>This command sets errdisable recovery time.</i></p>
<p>set mls</p>	<p>mls</p> <p><i>Multilayer Switching (MLS) occurs transparently in Cisco IOS Software.</i></p>
<p>set option errport</p>	<p>errdisable recovery cause</p> <p><i>This command configures errdisable options.</i></p>
<p>set port channel</p> <p><i>The default mode is auto.</i></p>	<p>channel-group group mode</p> <p><i>The default mode is off.</i></p>

<p>set port duplex</p>	<p>duplex</p> <p><i>The default behavior varies, which depends on the line card.</i></p>
<p>set port flowcontrol send [desired off on]</p>	<p>flowcontrol send [desired off on]</p>
<p>set port flowcontrol receive [desired off on]</p>	<p>flowcontrol receive [desired off on]</p>
<p>set port host</p>	<p>switchport switchport mode access spanning- tree portfast</p> <p><i>The access ports automatically have channeling/trunking turned off.</i></p>
<p>set port negotiation mod/port disable</p>	<p>speed nonegotiate</p> <p><i>Use this command on gigabit ports only. Use speed and duplex commands for 10/100 Mbps ports.</i></p>
<p>set port negotiation mod/port enable</p>	<p>no speed nonegotiate</p> <p><i>Use this command on gigabit ports only. Use speed and duplex commands for 10/100 Mbps ports.</i></p>

set port speed	speed <i>The default behavior varies, which depends on the line card.</i>
set qos	mls qos
set span	monitor session
set spantree	spanning-tree
set system crossbar-fallback	service internal [no] fabric switching-mode allow [bus-only truncated]
set test diaglevel	diagnostic level <i>This is the bootup diagnostic level.</i>
set trace	debug <i>Use this command with caution. Some debugs are intrusive.</i>
set trunk <i>The default mode is auto.</i>	switchport mode trunk <i>The default mode is desirable.</i>
set udd	udd <i>You configure this command globally and per interface.</i>

set vlan	<p>vlan switchport access vlan</p> <p><i>This command is a VLAN database command.</i></p> <p><i>The command is an interface command and does not create the VLAN.</i></p>
set vtp	<p>vtp</p> <p><i>This command is a VLAN database command.</i></p>
show boot	<p>show bootvar</p> <p><i>This command shows boot parameters.</i></p>
show cam dynamic	show mac-address-table dynamic
show channel info show port channel	show etherchannel summary
show errordetection	show errdisable detect
show errdisable-timeout	show errdisable recovery
show port show mac	show interface
show port status	show interface status
show span	show monitor

show sprom	show idprom <i>This command is useful to determine the chassis serial numbers.</i>
show system crossbar-fallback	show fabric switching-mode
show test [diaglevel mod]	show diagnostic [level mod module]
show qos	show mls qos
show traffic	show catalyst6000 traffic-meter <i>This command displays backplane utilization.</i>
show trunk show port trunk	show interfaces trunk
show udd	show udd
show vlan	show vlan
show vtp domain	show vtp status
switch console	remote login <i>Use this command only with Cisco Technical Support for a specific troubleshoot.</i>

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