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Sample Configuration: EtherChannel Between Catalyst Switches Running CatOS

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Introduction

This document discusses the setup of an EtherChannel between a Cisco Catalyst 5500 switch and a Catalyst 6500 switch, both running Catalyst OS (CatOS). Any Catalyst 4500/4000, 5500/5000, or 6500/6000 series switch running CatOS could have been used in this scenario to obtain the same results. EtherChannel can be called Fast EtherChannel (FEC) or Gigabit EtherChannel (GEC), depending on the speed of the interfaces or ports used to form the EtherChannel.

In this example, two Fast Ethernet (FE) ports from each of the switches have been bundled into an FEC. Throughout this document, the terms "Fast EtherChannel", "Gigabit EtherChannel", "port channel", "channel", and "port group" all refer to EtherChannel.

This document includes only the configuration files from the switches and the output from the related sample **show** commands. For further details on how to configure an EtherChannel between Catalyst switches, refer to the following document:

- [Configuring EtherChannel Between Catalyst 4000, 5000, and 6000 Switches Running CatOS](#)

This document does not provide configurations using the Link Aggregation Control Protocol (LACP). For more information on configuring LACP, refer to the following document:

- [Configuring LACP \(802.3ad\) Between a Catalyst 6000 and a Catalyst 4000](#)

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

- Catalyst 5500 switch running CatOS 6.3(7) software
- Catalyst 6500 switch running CatOS 7.2(2) software

Note: Before configuring the channel between the CatOS switches, refer to the following document:

- System Requirements to Implement EtherChannel on Catalyst Switches

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

For more information on document conventions, refer to Cisco Technical Tips Conventions.

Background Theory

EtherChannel may be configured unconditionally (using channel mode on), or it may be configured by having the switch negotiate the channel with the far end using the Port Aggregation Protocol (PAgP) (using channel mode desirable).

Note: Catalyst switches running CatOS support PAgP, and therefore desirable mode is recommended for setting up an EtherChannel between these devices. PAgP protects against any misconfigurations between the two devices. Channel mode on can be useful when the far end device does not support PAgP and you need to set up the channel unconditionally. The silent or non-silent keywords are available with auto and desirable channel modes. The silent keyword is enabled by default on all ports for Catalyst 4500/4000 or 6500/6000, and on copper ports of Catalyst 5500/5000 series switches. The non-silent keyword is enabled by default on all fiber ports (FE and Gigabit Ethernet [GE]) for Catalyst 5500/5000 series switches. It is recommended to use the default silent or non-silent keyword when connecting between Cisco switches.

For more details on PAgP and EtherChannel, go to the Technical Documentation for your release of CatOS software found on the Cisco Switches product pages. Refer to the sections *Configuring Fast EtherChannel and Gigabit EtherChannel* or *Configuring EtherChannel*. You may wish to use your browser Find feature to locate these sections.

Another good reference is the *EtherChannel / Port Aggregation Protocol* section of the following document:

- Best Practices for Catalyst 4000, 5000, and 6000 Series Switch Configuration and Management

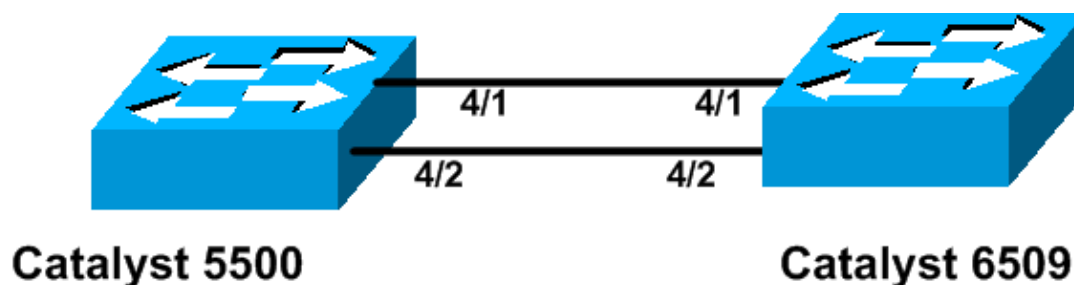
Configure

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

Note: To find additional information on the commands used in this document, use the Command Lookup Tool [↗](#) (registered customers only) .

Network Diagram

This document uses this network setup:



Configurations

This document uses these configurations:

- Catalyst 5500 Switch
- Catalyst 6500 Switch

Note: The configurations listed in this document have been implemented by configuring the EtherChannel using PAgP negotiation through the recommended desirable mode.

Catalyst 5500 Switch
<pre>#version 6.3(7) ! set option fddi-user-pri enabled ! #system set system name cat5500 ! #frame distribution method set port channel all distribution mac both ! #ip !--- This is the IP address used for management. set interface sc0 1 10.10.10.2/255.255.255.0 10.10.10.255 ! #set boot command set boot config-register 0x2102 set boot system flash bootflash:cat5000-sup3.6-3-7.bin ! #port channel !--- Ports are assigned to admin group 50. This admin group is assigned</pre>

```
!--- automatically when the port channel is configured, or it can be assigned manually.  
!--- If the admin group does not need to be assigned manually, this command should not be  
!--- manually set either. Let the switch create it automatically.  
!--- Also note that ports 4/1 through 4/4 are set for port channel even though only  
!--- 4/1-2 are configured. This is normal behavior. The ports 4/3 and 4/4 can  
!--- be used for any other purpose.
```

```
set port channel 4/1-4 50  
!  
# default port status is enable  
!  
!  
#module 1 : 2-port 1000BaseSX Supervisor  
!  
#module 2 empty  
!  
#module 3 empty  
!  
#module 4 : 24-port 10/100BaseTX Ethernet  
  
!--- Port channeling is enabled.  
  
set port channel 4/1-2 mode desirable silent  
!  
#module 5 : 12-port 10/100BaseTX Ethernet  
!  
#module 6 empty  
!  
#module 7 : 2-port MM OC-3 Dual-Phy ATM  
!  
#module 8 empty  
!  
#module 9 empty  
!  
#module 10 empty  
!  
#module 11 empty  
!  
#module 12 empty  
!  
#module 13 empty  
end
```

Catalyst 6500 Switch

```
#version 7.2(2)  
!  
!  
#system  
set system name cat6500  
!  
#!  
#ip  
  
!--- This is the IP address used for management.  
  
set interface sc0 1 10.10.10.1/255.255.255.0 10.10.10.255  
  
!  
#set boot command  
set boot config-register 0x2102  
set boot system flash bootflash:cat6000-supk8.7-2-2.bin  
!
```

```

#igmp
set igmp leave-query-type mac-gen-query
!
#port channel

!--- The ports are assigned to admin group 63. This admin group is assigned
!--- automatically when the port channel is configured or it can be assigned manually.
!--- If admin group does not need to be assigned manually, this command should not be
!--- manually set. Let the switch create it automatically.
!--- Also note that ports 4/1 through 4/4 are set for the port channel even though
!--- only 4/1-2 are configured. This is normal behavior. The ports 4/3 and 4/4
!--- can be used for any other purpose.

set port channel 4/1-4 63
!
# default port status is enable
!
!
#module 1 : 2-port 1000BaseX Supervisor
!
#module 2 : 2-port 1000BaseX Supervisor
!
#module 3 empty
!
#module 4 : 48-port 10/100BaseTX Ethernet

!--- Port channeling is enabled.

set port channel 4/1-2 mode desirable silent
!
#module 5 empty
!
#module 6 empty
!
#module 15 : 1-port Multilayer Switch Feature Card
!
#module 16 : 1-port Multilayer Switch Feature Card
end

```

Verify

This section provides information you can use to confirm your configuration is working properly.

show Commands

Certain **show** commands are supported by the Output Interpreter Tool [🔗](#) (registered customers only), which allows you to view an analysis of **show** command output.

To check the port channel in a CatOS switch, issue the following commands:

- **show port capabilities *module***
- **show port channel**
- **show port channel *module/port***
- **show port channel info**

To check the Spanning Tree Protocol (STP) status in a CatOS switch, issue the following commands:

- **show spantree**
- **show spantree *vlan***
- **show spantree *module/port***

Sample show Command Output

Catalyst 5500 Switch

show port capabilities *module*

This command is used to check whether the module is capable of channeling. It also shows what other ports are allowed to form the channel with this port.

```

cat5500> (enable) show port capabilities 4
Model                WS-X5225R
Port                 4/1
Type                 10/100BaseTX
Speed                auto,10,100
Duplex               half,full
Trunk encap type     802.1Q,ISL
Trunk mode           on,off,desirable,auto,nonegotiate
Channel             4/1-2,4/1-4
Broadcast suppression percentage(0-100)
Flow control         receive-(off,on),send-(off,on)
Security              yes
Dot1x                 yes
Membership            static,dynamic
Fast start            yes
QoS scheduling        rx-(none),tx-(none)
CoS rewrite           yes
ToS rewrite           IP-Precedence
Rewrite               no
UDLD                  yes
AuxiliaryVlan         1..1000,untagged,dot1p,none
SPAN                  source,destination

```

```

-----
Model                WS-X5225R
Port                 4/2
Type                 10/100BaseTX
Speed                auto,10,100
Duplex               half,full
Trunk encap type     802.1Q,ISL
Trunk mode           on,off,desirable,auto,nonegotiate
Channel             4/1-2,4/1-4
Broadcast suppression percentage(0-100)
Flow control         receive-(off,on),send-(off,on)
Security              yes
Dot1x                 yes
Membership            static,dynamic
Fast start            yes
QoS scheduling        rx-(none),tx-(none)
CoS rewrite           yes
ToS rewrite           IP-Precedence
Rewrite               no
UDLD                  yes
AuxiliaryVlan         1..1000,untagged,dot1p,none
SPAN                  source,destination

```

!--- Output suppressed.

show port channel

This command, along with the **show port channel info** command, is used to check the status of the port channel.

```
cat5500> (enable) show port channel
Port  Status      Channel
-----  -----  -----
4/1   connected   desirable silent
4/2   connected   desirable silent
-----  -----  -----
Admin Ch
Group Id

Port  Device-ID                               Port-ID           Platform
-----  -----  -----  -----
4/1   TBA04380080(cat6500)                   4/1               WS-C6506
4/2   TBA04380080(cat6500)                   4/2               WS-C6506
-----  -----  -----  -----
```

Note: Ports 4/3 and 4/4 are shown in the output above if they are in the not-connected status.

If you have the output of a **show port channel** command from your Cisco device, you can use the Output Interpreter Tool [🔗](#) (registered customers only), to display potential issues and fixes.

show spantree module/port

```
cat5500> (enable) show spantree 4/1
Port                Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----  -----  -----  -----  -----  -----  -----
4/1-2              1     forwarding  12       32   disabled  865

cat5500> (enable) show spantree 4/2
Port                Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----  -----  -----  -----  -----  -----  -----
4/1-2              1     forwarding  12       32   disabled  865
```

Note: Output of the **show spantree module/port** command for ports 4/1 and 4/2 is identical since these ports are grouped together in one channel with the Channel ID of 865.

Catalyst 6500 Switch

show port capabilities module

This command is used to check whether the module is capable of channeling. It also shows what other ports are allowed to form the channel with this port.

```
cat6500> (enable) show port capabilities 4/1
Model                WS-X6248-RJ-45
Port                 4/1
Type                 10/100BaseTX
Speed                auto,10,100
Duplex               half,full
Trunk encap type     802.1Q,ISL
```

```

Trunk mode                on,off,desirable,auto,nonegotiate
Channel                  yes
Broadcast suppression     no
Flow control              receive-(off,on),send-(off)
Security                  yes
Dot1x                    yes
Membership                static,dynamic
Fast start                yes
QOS scheduling            rx-(1q4t),tx-(2q2t)
CoS rewrite               yes
ToS rewrite               DSCP
UDLD                      yes
Inline power              no
AuxiliaryVlan             1..1000,1025..4094,untagged,dot1p,none
SPAN                      source,destination
COPS port group           4/1-48
Link debounce timer       yes

```

show port channel

This command, along with the **show port channel info** command, is used to check the status of the port channel.

```

cat6500> (enable) show port channel
Port  Status      Channel          Admin Ch
      Mode              Group  Id
-----
 4/1  connected  desirable silent    63   865
 4/2  connected  desirable silent    63   865

Port  Device-ID                      Port-ID                      Platform
-----
 4/1  069001645(cat5500)            4/1                          WS-C5500
 4/2  069001645(cat5500)            4/2                          WS-C5500

```

Note: Ports 4/3 and 4/4 are shown in the output above if they are in the not-connected status.

If you have the output of a **show port channel** command from your Cisco device, you can use the Output Interpreter Tool [🔗](#) (registered customers only), to display potential issues and fixes.

show port channel info

```

cat6500> (enable) show port channel info
Switch Frame Distribution Method: ip both

Port  Status      Channel          Admin Channel  Speed Duplex  Vlan
      Mode              Group  id          a-b  a-b    a-b
-----
 4/1  connected  desirable silent    63   865  a-100 a-full  1
 4/2  connected  desirable silent    63   865  a-100 a-full  1

Port  Channel Oper-group Neighbor Oper-Distribution PortSecurity/
      ifIndex          Oper-group Method          Dynamic port
-----
 4/1  215             241 1             ip both
 4/2  215             241 1             ip both

Port  Device-ID                      Port-ID                      Platform
-----
 4/1  069001645(cat5500)            4/1                          WS-C5500
 4/2  069001645(cat5500)            4/2                          WS-C5500

```

!--- Output suppressed.

show spantree vlan

The **show spantree** commands are used to verify if all the ports within a channel are grouped together and are in forwarding state.

```
cat6500> (enable) show spantree 1
VLAN 1
Spanning tree mode          PVST+
Spanning tree type          ieee
Spanning tree enabled

Designated Root             00-04-6d-82-88-00
Designated Root Priority    0
Designated Root Cost       38
Designated Root Port       4/25
Root Max Age 20 sec  Hello Time 2 sec  Forward Delay 15 sec

Bridge ID MAC ADDR          00-03-a0-e9-0c-00
Bridge ID Priority          32768
Bridge Max Age 20 sec  Hello Time 2 sec  Forward Delay 15 sec

Port                        Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----
1/1                         1     not-connected  4         32  disabled  0
1/2                         1     not-connected  4         32  disabled  0
2/1                         1     not-connected  4         32  disabled  0
2/2                         1     not-connected  4         32  disabled  0
4/1-2                      1     forwarding    12      32 disabled 865
4/3                         1     forwarding    19        32  disabled  0
4/4                         1     forwarding    19        32  disabled  0
4/5                         1     not-connected  100       32  disabled  0
4/6                         1     not-connected  100       32  disabled  0
4/7                         1     not-connected  100       32  disabled  0
4/8                         1     not-connected  100       32  disabled  0
4/9                         1     not-connected  100       32  disabled  0
4/10                       1     not-connected  100       32  disabled  0
4/11                       1     not-connected  100       32  disabled  0
4/12                       1     not-connected  100       32  disabled  0
4/13                       1     not-connected  100       32  disabled  0
4/14                       1     not-connected  100       32  disable
```

!--- Output suppressed.

If you have the output of a **show spantree** command from your Cisco device, you can use the Output Interpreter Tool [🔗](#) (registered customers only), to display potential issues and fixes.

show spantree module/port

```
cat6500> (enable) show spantree 4/1
Port                        Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----
4/1-2                      1     forwarding    12      32 disabled 865

cat6500> (enable) show spantree 4/2
Port                        Vlan  Port-State  Cost      Prio  Portfast  Channel_id
-----
```

Note: Output of the **show spantree *module/port*** command for ports 3/1 and 3/2 is identical since these ports are grouped together in one channel with the Channel ID of 865.

Special Consideration Using Unconditional on Channel Mode

Cisco recommends using PAGP for port channel configuration, as described in Background Theory, above. If for any reason you are configuring the EtherChannel unconditionally (using channel mode on), it is recommended that you create a port channel by following the steps below. This avoids possible problems with STP during the configuration process. STP loop detection may disable the ports if one side is configured as a channel before the other side can be configured as a channel.

1. Set the ports to be used in port channeling to disable mode on the first switch by issuing the **set port disable *module/port*** command.
2. Create the port channel (port group) on the first switch and set the channel mode to on.
3. Create the port channel on the second switch and set the channel mode to on.
4. Re-enable the ports that were disabled earlier on the first switch by issuing the **set port enable *module/port*** command.

Related Information

- [Configuring EtherChannel Between Catalyst 4000, 5000, and 6000 Switches Running CatOS](#)
- [System Requirements to Implement EtherChannel on Catalyst Switches](#)
- [LAN Product Support Pages](#)
- [LAN Switching Support Page](#)
- [Technical Support – Cisco Systems](#)

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