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Table of Contents

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Layer 3 Etherchannel on Cisco IOS Switch

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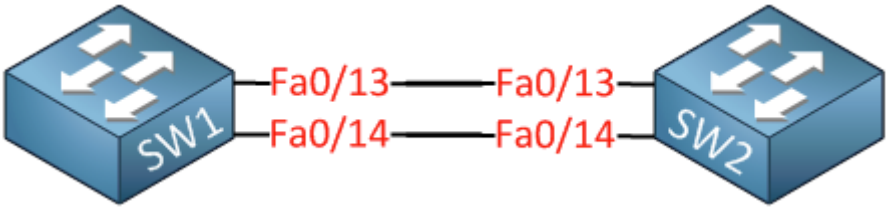
In a previous tutorial I explained how Etherchannels work and how to configure them, but I didn't write about layer 3 Etherchannels before. In this tutorial I'll show you how to configure them.

I'll be using two switches for this:



Before we configure the port channel settings you need to make sure that all interfaces have the **exact same** configuration. Once you use the **channel-group** command, the port-channel interface will automatically inherit all settings from your physical interface. If you forget to run the **no switchport** command on an interface, your etherchannel will be layer 2 instead of layer 3!

Having said that, let's configure our switches:

```
SW1(config)#interface range fastEthernet 0/13 - 14
SW1(config-if-range)#no switchport
SW1(config-if-range)#channel-group 12 mode on
Creating a port-channel interface Port-channel 12
```

```
SW2(config)#interface range fa0/13 - 14
SW2(config-if-range)#no switchport
SW2(config-if-range)#channel-group 12 mode on
Creating a port-channel interface Port-channel 12
```

This creates our Etherchannel, we can verify our work like this:

```
SW1#show etherchannel 12 summary
Flags:  D - down        P - bundled in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator

        M - not in use, minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port

Number of channel-groups in use: 1
```

```
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------
--
12     Po12(RU)         -        Fa0/13(P)   Fa0/14(P)
```

Above you can see that our port-channel 12 interface is layer 3 and it's operational. Just like any other layer 3 interface we can configure an IP address on this port-channel interface:

```
SW1(config)#interface port-channel 12
SW1(config-if)#ip address 192.168.12.1 255.255.255.0
```

```
SW2(config)#interface port-channel 12
SW2(config-if)#ip address 192.168.12.2 255.255.255.0
```

Let's see if that works:

```
SW1#ping 192.168.12.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.12.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/8 ms
```

No problem at all! If you enabled ip routing on your switch you will see that the switch uses the port-channel interface in its routing table:

```
SW1#show ip route connected
C    192.168.12.0/24 is directly connected, Port-channel12
```

That's all there is to it, I hope this tutorial has been useful to you!

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Home › Forums › Layer 3 Etherchannel on Cisco IOS Switch

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Viewing 15 posts - 1 through 15 (of 23 total)
1 2 →

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- July 10, 2014 at 21:54 #11978 Reply

mohammed m
Member
you are inspirational teacher .

thanks for your books

and your website

July 11, 2014 at 07:31 #11979 Reply

Rene Molenaar
Keymaster
Thank you for the kind words Mohammed!

July 13, 2014 at 15:38 #11980 Reply

Harold
Thanks a lot, Rene, you are amazing, Im studying for ccna certification and then I wanna do the ccnp and ccie, Thanks for your help and this an amazing Web.

Grettings From Venezuela

November 2, 2014 at 21:31 #11981 Reply

catalino N
Participant
Hi rene, I am trying to configure a layer 3 etherchannel, the new version of GNS3 but once configured everything, I can not do ping between the two portchannel, I appreciate your usual help, I'm using the version that uses the IOU of a virtual machine built to GNS3

November 3, 2014 at 19:19 #11982 Reply

Rene Molenaar
Keymaster
Hi Catalino N,

I think this might be an IOU problem, I've read before that it accepts the configuration but that you can't send any traffic through L3 etherchannels.

When you use the show commands, everything looks fine?

Rene

September 24, 2015 at 21:23 #11983 Reply

sze jie k
Participant
Hi Rene ,

What s the difference between a l2 and l3 etherchannel ? Beside the fact that a l3 port channel has a IP address .

Do they difference in the way traffic is load balance across the links or ?

Hope to hear your advice soon !

September 24, 2015 at 21:40 #11984 Reply

Rene Molenaar
Keymaster
Hi Alan,

It's exactly the same as the "switched port" and the "routed port". The L3 etherchannel has IP addresses, the L2 etherchannel has vlan(s). All the other stuff like load balancing is the same.

Rene

September 25, 2015 at 14:41 #11985 Reply

sze jie k
Participant
Hi Rene,

q1) in your example above, for L3 etherchannel setup
– on SWITCH2 configuration, you did not input the command "no switchport" unlike in SWITCH1 which you did – why ?
– it is mentioned in the cisco doc that for L3 etherchannel (http://www.cisco.com/c/en/us/td/docs/switches/lan/catalyst3550/software/release/12-1_13_ea1/configuration/guide/3550scg/swethchl.html#wp1020401)
under "Configuring Layer 3 EtherChannels " -> port channel is to be created 1st, then use channel group to add physical interfaces into the port channel.
however, in our example above, port channel is not created , but channel group is used on the physical interface to create the port-channel .
In which sequence it is correct ?

q2) can we have an etherchannel of different type at each end of an etherchannel link ?
(E.g. L2 switch to Router?)
L2 on the switch, L3 on the router

q3) for L3 etherchannel, is load balancing different from L2 etherchannel (e.g. L3 loadbalancing is using SRC / DST IP ?), can L3 etherchannel load balance using MAC ?

q4) From you example, i believe we can have different load balance mode on each end of an etherchannel right ?

Hope to hear from you soon.

Regards,
Alan

September 26, 2015 at 12:39 #11986 Reply

Rene Molenaar
Keymaster
Hi Alan,

1) This was an error which I just fixed. On both ends it should be “no switchport”. There’s two ways how you can create the Etherchannel, you could first manually create the port channel interface and add the physical interfaces or you can do what I did. If you assign physical interfaces to a non-existing port channel then it will be automatically created.

2) Hmm I haven’t tried this but I guess it could work. It’s similar to connecting a router interface (L3 routed port) to a switch (L2 switchport).

3) Load balancing is the same for L2 and L3 and you can use a different load balancing method on each side.

Rene

September 27, 2015 at 20:42 #11987 Reply

sze jie k
Participant
Hi Rene,

Thanks for the concise reply.

On 2) Is it not a norm to setup etherchannel from switch to router ? I am just wondering if i am to have multiple switches doing etherchannel to a core switch, but if the core switch would have just 1 physical link up to the router, isn’t that the choking point for all the high availability and bandwidth among the switches ?

Regards,
Alan

September 28, 2015 at 11:40 #11988 Reply

Rene Molenaar
Keymaster
Hi Alan,

It depends on your WAN connection. On your LAN we use gigabit links to desktops and perhaps 10 gigabit links (or etherchannel with gigabit) for all internal traffic. If your WAN link is only 100Mbit then that's your bottleneck.

Rene

October 27, 2015 at 01:56 #19205 Reply

Paul C
Participant
Hi René,

Thank you for your excellent book. But concerning this lab, i am curious to know why this does not work for me. I have exactly the same configuration. May be you use a real switch.

For me i use a Cisco Iou layer L2 switch. can you give me some idea? I am confuse.

Thank you again

Paul

October 27, 2015 at 07:37 #19208 Reply

Rene Molenaar
Keymaster
Hi Paul,

I used real switches for this. I think the support for Etherchannel in some of the L2 IOU images might have some bugs.

Since a few weeks I'm using VIRL, just tried PAGP in it and that worked without any issues.

Rene

November 2, 2015 at 11:52 #19406 Reply

Dirk R
Participant
Hi Rene, you mention above that you have been able to get L3 PAgP working with VIRL. When I try, the etherchannel is always suspended at both ends. See output of 'show etherchannel summary' command.

Group Port-channel Protocol Ports
——+———-+———-+——————————————–
1 Po1(RD) PAgP Gi0/1(s)

I've tried 'sudo vinstall bridge' & restarting my VIRL vm as recommended on the VIRL discussion pages, however the problem persists and I continue to receive the log message:

*Nov 2 10:48:04.907: %EC-5-L3DONTBNDL1: Gi0/1 suspended: PAgP not enabled on the remote port.

although it is configured on both switches.

Would appreciate any advice regarding how you got it to work.

thank you,

Dirk

November 4, 2015 at 22:07 #19525 Reply

Rene Molenaar
Keymaster
Hi Dirk,

I also experienced this a few times. I didn't install anything nor rebooted my VIRL server. I'm running the latest version.

I'm not exactly sure what fixed it for me but I think a "shut/no shut" on the PO interface didn't solve it. After removing the PO interface and adding it again it started to work.

If you want, I can check it again.

Rene

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1 2 →
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