

Troubleshoot interface down issues in Cisco routers

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Introduction

This document describes troubleshoot methodology for interface down scenario on ethernet links. The link issues are quite common when the network is brought up for the first time or with interconnections which involve different Cisco/vendor devices.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- VRF - Virtual Routing and Forwarding

Conventions

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

Troubleshoot Methodology

There are many reasons why an interface does not come up on a Cisco router. Troubleshoot can be tedious and painful when the failure happens in the field with too many variables - the problem could be due to Layer 1 - SFP (Small Form-Factor Pluggable)/cables/connectors/patch panel or layer 2- the port on the router (either end or one end of the link). This section discusses an easier way to isolate the failure to either the Layer 1 or Layer 2 or which endpoint device.

Interface link parameters must match at both ends of the link

Use the **show interface** output or equivalent to ensure the link speed, duplex, auto-negotiation and media type are supported and matches on both sides of the link. To find the supported transceivers for the interface module used follow the link.

[Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix](#)

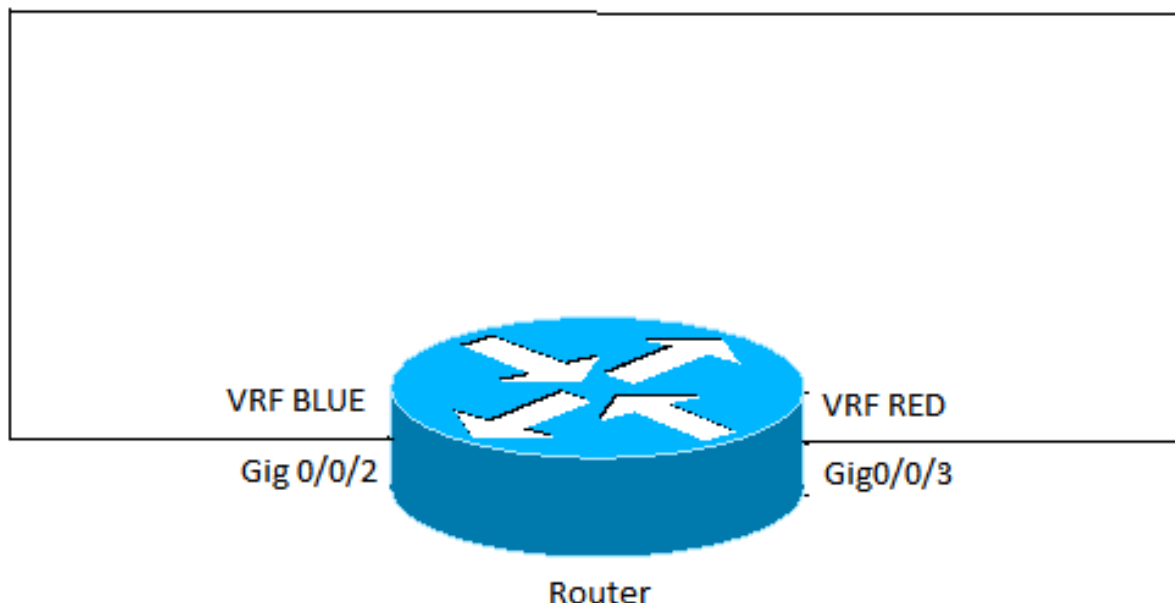
Configure the interface in local loopback

This tests the packet path inside the router all the way till PLIM(Physical Layer Interface Module). If the router/ ports ASIC's are properly initialised the interface should come up and self ping must work. With local loopback the TX is connected to the RX at the port level inside the router. This test will exclude the SFP and the cables in the packet path. Failure of the port to come up/ping itself with a local loop indicates a problem with the Cisco Router. Contact Cisco TAC to troubleshoot it further.

Test the ports and cables with VRF

This test is particularly useful when the loopback test is successful and to identify which end of the link is at fault or if it is an interoperability issue between devices. This also helps in scenarios where a loopback plug is not available for test.

Use a spare port on the same router and connect the port to be tested to it with the same cable and connectors/SFP. The router is now looped back to itself. Configure the two ports/interface in two different VRF's and in the same subnet. Ping from one VRF to the other VRF.



- If the Ping fails, it points to a cable or SFP problem. Change the cables and SFP.
- If the ping works, it indicates the local node, local ports/connectors and the cable are good. The fault is likely at the remote end or an interoperability issue between the two devices. Do the same tests at the remote device and then contact Cisco TAC to check for any

compatibility issues between the two devices.

Troubleshoot Examples

The examples are pulled for an ethernet link on ASR1000 router. However the same concept can be used for other Cisco routers and L1 technologies.

Interface link parameters must match at both ends of the link

```
GigabitEthernet0/0/0 is up, line protocol is up
Hardware is SPA-10X1GE-V2, address is 0023.33ee.7c00 (bia 0023.33ee.7c00)
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
Full Duplex, 1000Mbps, link type is auto, media type is LX
output flow-control is off, input flow-control is off
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:01, output 00:02:31, output hang never
Last clearing of "show interface" counters never
Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
314 packets input, 24637 bytes, 0 no buffer
Received 0 broadcasts (0 IP multicasts)
0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
0 watchdog, 314 multicast, 0 pause input
1 packets output, 77 bytes, 0 underruns
0 output errors, 0 collisions, 6 interface resets
17 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out
```

Configure the interface in local loopback

```
Router#show ip int br | in GigabitEthernet0/0/1
GigabitEthernet0/0/1 192.0.0.1 YES manual down down
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
STLD1-630-03.04-ASR1(config)#interface gigabitEthernet 0/0/1
STLD1-630-03.04-ASR1(config-if)#loopback mac
Loopback is a traffic-affecting operation
IPv6 self ping is not supported
STLD1-630-03.04-ASR1(config-if)#
*Aug 29 17:12:21.259: %LINK-3-UPDOWN: Interface GigabitEthernet0/0/1, changed state to
up
*Aug 29 17:12:20.652: %LINK-3-UPDOWN: SIP0/0: Interface GigabitEthernet0/0/1, changed
```

```
state to up
*Aug 29 17:12:22.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0/1, changed state to up
STLD1-630-03.04-ASR1(config-if)#
STLD1-630-03.04-ASR1(config-if)#end
Router#
*Aug 29 17:12:28.684: %SYS-5-CONFIG_I: Configured from console by console
Router#$g-config interface gigabitEthernet 0/0/1
Building configuration...
```

```
Current configuration : 106 bytes
!
interface GigabitEthernet0/0/1
ip address 192.0.0.1 255.255.255.0
loopback mac
negotiation auto
end
```

```
Router#ping 192.0.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.0.0.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
Router#
```

Test the ports and cables with VRF

```
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#vrf definition RED
Router(config-vrf)#address-family ipv4
Router(config-vrf-af)#exit
Router(config-vrf)#vrf definition BLUE
Router(config-vrf)#address-family ipv4
Router(config-vrf-af)#exit
Router(config-vrf)#end
*May 16 03:41:04.173: %SYS-5-CONFIG_I: Configured from console by consoleinter
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0/3
Router(config-if)#vrf forwarding RED
Router(config-if)#ip address 1.1.1.1 255.255.255.252
Router(config-if)#cdp enable
Router(config-if)#interface gigabitEthernet 0/0/2
Router(config-if)#vrf forwarding BLUE
Router(config-if)#ip address 1.1.1.2 255.255.255.252
Router(config-if)#cdp enable
Router(config-if)#end
Router#
*May 16 03:42:02.070: %SYS-5-CONFIG_I: Configured from console by console
Router#ping vrf BLUE 1.1.1.2
```

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.2, timeout is 2 seconds:

!!!!

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

Router#ping vrf BLUE 1.1.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:

!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 1/1/1 ms

Router#ping vrf RED 1.1.1.1

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:

!!!!

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

Router#ping vrf RED 1.1.1.2

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 1.1.1.2, timeout is 2 seconds:

!!!!

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

Router#

Router#\$g-config interface gigabitEthernet 0/0/2

Building configuration...

Current configuration : 154 bytes

!

interface GigabitEthernet0/0/2

description Looped to 0/0/3

vrf forwarding BLUE

ip address 1.1.1.2 255.255.255.252

negotiation auto

cdp enable

end

Router#\$g-config interface gigabitEthernet 0/0/3

Building configuration...

Current configuration : 153 bytes

!

interface GigabitEthernet0/0/3

description Looped to 0/0/2

vrf forwarding RED

ip address 1.1.1.1 255.255.255.252

negotiation auto

cdp enable

end

Router#