



CHAPTER 9

Troubleshooting Routing

This chapter describes troubleshooting procedures for routing.

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Information about Troubleshooting Routing Issues

Layer 3 routing involves determining optimal routing paths and packet switching. You can use routing algorithms to calculate the optimal path from the router to a destination. This calculation depends on the algorithm selected, route metrics, and other considerations such as load balancing and alternate path discovery.

Cisco NX-OS uses the virtual device contexts (VDCs) to provide separate management domains per VDC and software fault isolation. Each VDC supports multiple Virtual Routing and Forwarding Instances (VRFs) and multiple routing information bases (RIBs) to support multiple address domains.

Each VRF is associated with a routing information base (RIB) and this information is collected by the Forwarding Information Base (FIB).

See the *Cisco NX-OS Unicast Routing Configuration Guide* and the *Cisco NX-OS Multicast Routing Configuration Guide* for more information on routing.

Initial Troubleshooting Checklist

Begin troubleshooting routing issues by checking the following issues first:

Checklist	Checkoff
Verify that the routing protocol is enabled.	<input type="checkbox"/>
Verify that the address family is configured if necessary.	<input type="checkbox"/>
Verify that you have configured the correct VRF for your routing protocol	<input type="checkbox"/>

Use the following commands to display routing information:

- **show ip arp**

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- **show ip traffic**
- **show tcp statistics udp4**
- **show ip client**
- **show tcp client**
- **show ip fib**
- **show ip process**
- **show ip route**
- **show pktmgr interface**
- **show frame traffic**
- **show platform fib**
- **show platform forwarding**
- **show platform ip**
- **show vrf**
- **show vrf interface**

Troubleshooting Routing

To troubleshoot basic routing issues, follow these steps:

Step 1 Verify that the routing protocol is enabled.

```
switch(config)# show ospf
                    ^
% invalid command detected at '^' marker.
```

If the feature is not enabled, Cisco NX-OS reports that the command is invalid. Use the **feature** command to enable the routing protocol.

Step 2 Verify the configuration for this routing protocol.

```
switch# show running-config eigrp all
version 4.0(1)
feature eigrp
router eigrp 99
log-neighbor-warnings
  log-neighbor-changes
  log-adjacency-changes
  graceful-restart
nsf
timers nsf signal 20
distance 90 170
metric weights 0 1 0 1 0 0
metric maximum-hops 100
default-metric 100000 100 255 1 1500
maximum-paths 16
address-family ipv4 unicast
  log-neighbor-warnings
  log-neighbor-changes
  log-adjacency-changes
  graceful-restart
  router-id 192.0.2.1
```

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```
nsf
timers nsf signal 20
distance 90 170
metric weights 0 1 0 1 0 0
metric maximum-hops 100
default-metric 100000 100 255 1 1500
maximum-paths 16
```

Step 3 Verify the VRF configuration for this routing protocol.

```
switch# show running-config eigrp
version 4.0(1)
feature eigrp
router eigrp 99
  address-family ipv4 unicast
    router-id 192.0.2.1
  vrf red
  stub
```

Step 4 Check the memory utilization for this routing protocol.

```
switch# show processes memory | include isis
8913 9293824 bffff1d0/bffff0d0 isis
32243 8609792 bfffe0c0/bfffd0c0 isis
```

Step 5 Verify that the routing protocol is receiving packets.

```
switch# show ip client pim
Client: pim, uuid: 284, pid: 3839, extended pid: 3839
Protocol: 103, client-index: 10, routing VRF id: 255
Data MTS-SAP: 1519
Data messages, send successful: 2135, failed: 0
```

Step 6 Verify that the routing protocol is enabled on an interface.

```
switch# show ip interface loopback0
loopback0, Interface status: protocol-up/link-up/admin-up, iod: 36, Context:"default"
  IP address: 1.0.0.1, IP subnet: 1.0.0.0/24
  ...
  IP multicast groups locally joined:
    224.0.0.2 224.0.0.1 224.0.0.13
  ...
```

Step 7 Verify that the interface is in the correct VRF.

```
switch(config)# show vrf interface loopback 99
Interface          VRF-Name          VRF-ID
loopback99         default            1
```

Step 8 Verify that the routing protocol is registered with the RIB.

```
switch(config)# show routing unicast clients
CLIENT: am
index mask: 0x00000002
epid: 3908      MTS SAP: 252      MRU cache hits/misses:      2/1
Routing Instances:
  VRF: management      table: base
Messages received:
  Register      : 1      Add-route      : 2      Delete-route      : 1
Messages sent:
  Add-route-ack  : 2      Delete-route-ack : 1
CLIENT: rpm
index mask: 0x00000004
```

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```

epid: 4132      MTS SAP: 348      MRU cache hits/misses:      0/0
Messages received:
  Register      : 1
Messages sent:

```

...

```

CLIENT: eigrp-99
index mask: 0x00002000
epid: 3148      MTS SAP: 63775      MRU cache hits/misses:      0/1
Routing Instances:
  VRF: default      table: base      notifiers: self
Messages received:
  Register      : 1      Delete-all-routes : 1
Messages sent:

```

...

Step 9 Verify that the RIB is interacting with the forwarding plane.

```

switch# show forwarding distribution multicast client
Number of Clients Registered: 3
Client-name Client-id Shared Memory Name
igmp        1          N/A
mrib        2          /procket/shm/mrib-mfdm
m6rib       3          /procket/shm/m6rib-mfdm

```
