CCNP ENARSI

Incident 05

IPv4 Preferred Path Drift

Student troubleshooting workbook | Shared dual-stack OSPF network

Branch IPv4 reachability remains up but the approved R1-R2 equal-cost route has changed to a single R1-R3 path. IPv6 path diversity is normal.

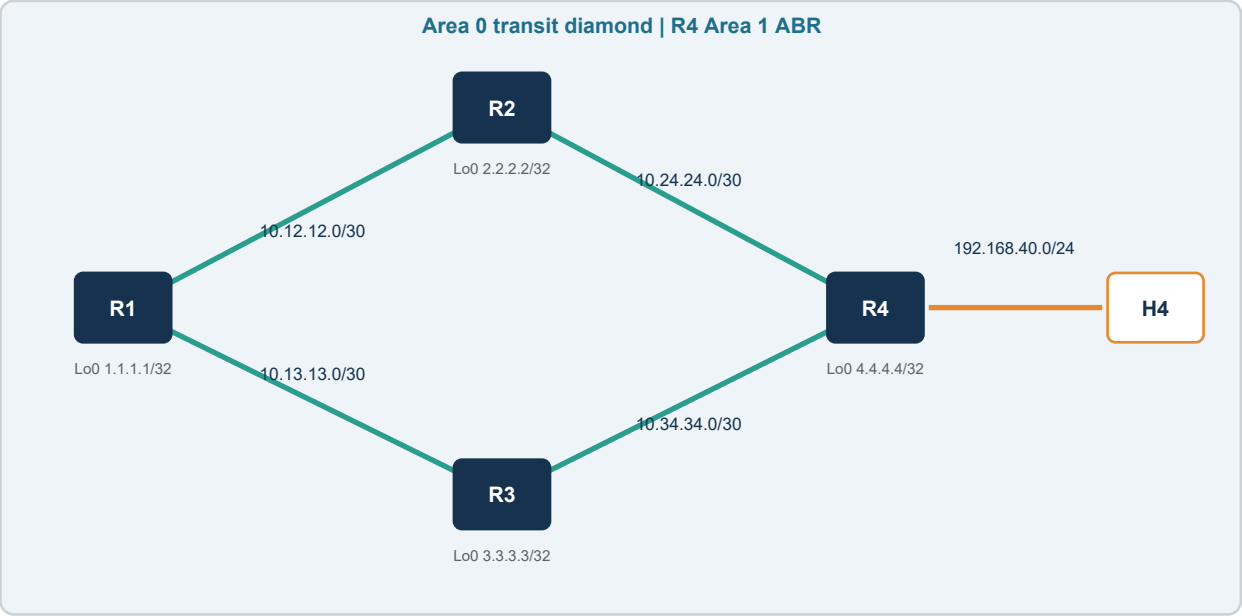
CLI annotations: GREEN - expected healthy result; YELLOW - warning or interpretation required; RED - fault or failed requirement. Colors are workbook annotations, not native CLI colors. Variable timers and ages may differ. Yellow/red items include a one-line reason.

1. Ticket and business impact

Branch IPv4 reachability remains up but the approved R1-R2 equal-cost route has changed to a single R1-R3 path. IPv6 path diversity is normal.

2. Approved healthy network

The healthy reference has two Area 0 paths per address family, two FULL neighbors on each router, R4 Area 1 advertisements and successful H4 reachability from R1. Compare the observed state with the master workbook before making changes.



Connection and address plan

Link	IPv4 endpoints	IPv6 endpoints
R1 e0/0 - R2 e0/0	10.12.12.1/30 | 10.12.12.2/30	2001:DB8:12::1/64 | 2001:DB8:12::2/64
R2 e0/1 - R4 e0/0	10.24.24.1/30 | 10.24.24.2/30	2001:DB8:24::1/64 | 2001:DB8:24::2/64
R1 e0/1 - R3 e0/0	10.13.13.1/30 | 10.13.13.2/30	2001:DB8:13::1/64 | 2001:DB8:13::2/64
R3 e0/1 - R4 e0/1	10.34.34.1/30 | 10.34.34.2/30	2001:DB8:34::1/64 | 2001:DB8:34::2/64
R4 e0/2 - H4 e0/0	192.168.40.1/24 | .10/24	2001:DB8:40::1/64 | ::10/64

Router Loopback0: Rn uses n.n.n.n/32 and 2001:DB8:n::n/128. R4 is Area 0/1 ABR. H4 has static default routes to R4.

3. Incident starting file and rules

Open only Lab 08 OSPF Production Troubleshooting Challenge-incident-05.unl. This file is a separate copy of the healthy network with one injected change. Do not use the healthy save-config file as the broken ticket. Preserve

unrelated services and restrict edits to the fault you can prove.

4. Initial symptoms: actual CLI evidence

Actual CLI output - R1

```
R1# show ip ospf neighbor
Neighbor ID     Pri   State           Dead Time   Address         Interface
3.3.3.3           0   FULL/  -        00:00:39    10.13.13.2      Ethernet0/1
2.2.2.2           0   FULL/  -        00:00:38    10.12.12.2      Ethernet0/0
```

Actual CLI output - R1

```
R1# show ipv6 ospf neighbor
            OSPFv3 Router with ID (1.1.1.1) (Process ID 30)
Neighbor ID     Pri   State           Dead Time   Interface ID    Interface
3.3.3.3           0   FULL/  -        00:00:31    1               Ethernet0/1
2.2.2.2           0   FULL/  -        00:00:31    1               Ethernet0/0
```

Actual CLI output - R1

```
R1# show ip route 192.168.40.0
Routing entry for 192.168.40.0/24
  Known via "ospf 10", distance 110, metric 30, type inter area
  Last update from 10.13.13.2 on Ethernet0/1, 00:03:16 ago
  Routing Descriptor Blocks:
  * 10.13.13.2, from 4.4.4.4, 00:03:16 ago, via Ethernet0/1
      Route metric is 30, traffic share count is 1
```

WARNING - Only one installed path remains where the approved baseline requires two; service may still answer through the survivor.

Actual CLI output - R1

```
R1# show ipv6 route 2001:DB8:40::/64
Routing entry for 2001:DB8:40::/64
  Known via "ospf 30", distance 110, metric 30, type inter area
  Route count is 2/2, share count 0
  Routing paths:
    FE80::A8BB:CCFF:FE00:3000, Ethernet0/1
      Route metric is 30, traffic share count is 1
      From FE80::A8BB:CCFF:FE00:3000
      Last updated 00:03:23 ago
    FE80::A8BB:CCFF:FE00:2000, Ethernet0/0
      Route metric is 30, traffic share count is 1
      From FE80::A8BB:CCFF:FE00:2000
      Last updated 00:03:23 ago
```

Actual CLI output - R1

```
R1# ping 192.168.40.10 source Loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.10, timeout is 2 seconds:
Packet sent with a source address of 1.1.1.1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/2 ms
```

Actual CLI output - R1

```
R1# ping 2001:DB8:40::10 source Loopback0
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:40::10, timeout is 2 seconds:
Packet sent with a source address of 2001:DB8:1::1
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/9 ms
```

5. Investigation workspace

Record the first failed or degraded service, the exact command and output, the last known healthy observation, and a hypothesis. Then compare OSPFv2 and OSPFv3 neighbor states, the Area 1 routes and the unchanged local gateway. Do not repair until the evidence identifies a specific configuration boundary.

Questions: Which address family is affected? Is an adjacency missing, a prefix withdrawn or just one equal-cost next hop absent? Which routes and client probes remain healthy? What is the smallest change that restores the approved state?

6. Service boundary and success criteria

Intended investigation scope: R1 IPv4 path selection to the branch; one next hop is removed from the installed route.

Services that must remain healthy: All OSPFv2 adjacencies and IPv4 connectivity; all IPv6 neighbors, ECMP and client paths.

7. Final regression checklist

After repair require: both OSPFv2 and OSPFv3 FULL neighbor matrices; two installed branch next hops in each address family; H4 local gateway responses; successful R1-to-H4 and H4-to-R1 IPv4/IPv6 pings; no new route loss or configuration change outside this ticket. Record the evidence and only then save.

Use the matching Solution Guide only after your investigation and proposed repair are complete.