Introduction

This document provides troubleshooting information for common problems with Open Shortest Path First (OSPF). To see more information, or to go to the next flowchart, click the command boxes in red.

Prerequisites
Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

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

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Main Flowchart

If you have the output of a `show ip ospf neighbor`, `show ip ospf neighbor`, or `show tech-support` command from your Cisco device, you can use the Cisco CLI Analyzer (registered customers only) to display potential issues and fixes. To use Cisco CLI Analyzer, you must have JavaScript enabled.
Troubleshoot OSPF Neighbor States

Refer to [OSPF Neighbor States](#) for neighbor state descriptions.

![Flowchart showing the troubleshooting process for OSPF neighbor states.](image-url)
Troubleshoot the OSPF Routing Table

1. OSPF Route Check
2. Determine what type of routes are missing from the routing table
3. What type of OSPF routes are you missing from the routing table?
4. ALL OSPF routes?
   - Full Adjacency Check
5. Only External routes? (Routes originated from another routing process)
   - External LSA Check
6. Only Summary Routes? (Routes originating from another area)
   - Carefully check area 0 and verify that it is contiguous. If the problem persists, open a TAC case.
7. NSSA routes
   - Open TAC case

Troubleshoot OSPF Init State
Refer to [Why Does the show ip ospf neighbor Command Reveal Neighbors in the Init State?](#) for an Init State problem description and troubleshooting steps.

**Troubleshoot OSPF MTU**
**Note:** If the problem is related to Layer 2, check if a proxy ARP is enabled. If it is enabled, disable it, and use the `clear ip arp` command in order to clear the ARP cache.

### Troubleshoot OSPF Corrupt Packets

1. **Corrupted Packet Check**
2. Determine if packets are getting corrupted.
3. Are "OSPF-4-BADLSA type" error messages seen on the console?
   - **No**
     - If neighbor adjacency does not become full after a few moments, open a TAC case.
   - **Yes**
     - **Main 1**

### Troubleshoot OSPF Two-Way State

Refer to [Why Does the show ip ospf neighbor Command Reveal Neighbors Stuck in 2-Way State?](link)
for an OSPF Two-way State problem description and troubleshooting steps.

Troubleshoot OSPF Links
You can use an Embedded Event Manager (EEM) script to troubleshoot the links flapping.

For more information, refer to this Cisco Support Community document that describes how to use an EEM script in order to collect information from a router when there is an OSPF flap: Troubleshooting OSPF Flaps with EEM Script.
Troubleshoot External Link-State Advertisements

Refer to Common Routing Problem with OSPF Forwarding Address for a description of forwarding addresses in external LSA, and for troubleshoot steps concerning the most common problems with LSAs having non-zero forwarding addresses.
Troubleshoot OSPF NBMA Networks

Refer to Problems with Running OSPF in NBMA Mode over Frame Relay for more information on common OSPF over NBMA network problems.

Troubleshoot Access Lists

If necessary you must modify the ACL so that it doesn't interfere with OSPF.
Troubleshoot Neighbors over PRI

- Neighbors over PRI Check
  - Need to determine if router is connected with multiple neighbors over the PRI interface.
  - Are neighbors connected via PRI/BRI link?
    - No: Open a TAC case
    - Yes:
      - Is OSPF network type point to multipoint? (Use `show ip ospf interface` command to check)
        - No:
          - Configure all neighboring links as OSPF point to multipoint. Refer to Configuring OSPF for more detailed information.
          - Did this fix the problem?
            - Yes: Hooray
            - No: ACL Check
        - Yes: Open TAC case

Troubleshoot Ping
Troubleshoot the OSPF Interface

1. OSPF Interface Check
   - OSPF enabled on interface check

2. Is OSPF configured on both neighboring interfaces? (Use `show ip ospf interface` to check)
   - Yes
     - Is either of the neighboring interfaces configured as passive interfaces under OSPF? (Use `show ip ospf interface` to check)
       - Yes → OSPF will not send hellos and won't form neighbors over a passive interface
       - No → OSPF enabled on both neighboring interfaces
   - No → Enable OSPF on both neighboring interfaces
Troubleshoot Frame Relay Environment

Frame Relay Environment Check

Is this a Frame Relay environment?

No → Open TAC case

Yes →

Is the OSPF network type point to multipoint? (Use `show ip ospf interface` to check)

No → In a Frame Relay environment, we recommend using the point-to-multipoint OSPF network type. See Problems with Running OSPF in NBMA Mode over Frame Relay. If the problem persists, open a TAC case.

Yes → Open TAC case

Troubleshoot External Route Problems

...
Troubleshoot Network Type

Network Type Check

Determine OSPF network type for neighboring interfaces

Is the OSPF network type broadcast for the neighboring interfaces? (Use `show ip ospf interface` to check)

- No → Open TAC case
- Yes →

Is the subnet mask the same for the neighboring interfaces? (Use `show ip ospf interface` to check)

- No → For broadcast network type the subnet mask must be the same for all neighbors.
- Yes → Area Type Check

Troubleshoot OSPF Area Type
Troubleshoot the Hello/Dead Interval Mismatch

1. **Area Type Check**
   - Determine if neighboring interfaces are configured in the same area.

2. **Are neighboring interfaces configured in the same area?**
   - No: Neighboring interfaces must be in the same area for successful neighbor negotiation.
   - Yes: Proceed to the next step.

3. **Are neighboring interfaces in the same type of area, such as stub or nssa?**
   - No: Neighboring interfaces must be in the same type of area for successful neighbor negotiation.
   - Yes: Proceed to the next step.

4. **NBMA Broadcast Check**

5. **Hello/Dead Interval Check**
Note that the debug output from the `debug ip ospf hello` command shows the mismatch in hello parameters. Here is the sample debug output:

```
*Oct 12 14:03:32.595: OSPF: Send hello to 224.0.0.5 area 0 on FastEthernet1/0 from 192.168.12.2
*Oct 12 14:03:33.227: OSPF: Rcv hello from 1.1.1.1 area 0 from FastEthernet1/0
*Oct 12 14:03:33.227: OSPF: Mismatched hello parameters from 192.168.12.1
*Oct 12 14:03:33.231: OSPF: Dead R 2 C 3, Hello R 1 C 1 Mask R 255.255.255.0 C 255.255.255.0
*Oct 12 14:03:33.531: OSPF: Send hello to 224.0.0.5 area 0 on FastEthernet1/0 from 192.168.12.2
```

Related Information

- [OSPF Support Page](#)
- [Technical Support & Documentation - Cisco Systems](#)