Why Does the show ip ospf neighbor Command Reveal Neighbors in the Init State?

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Contents

Introduction

This document explains the possible causes and solutions for why the **show ip ospf neighbor** command reveals Open Shortest Path First (OSPF) neighbors in the init state.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

Conventions

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

Problem

Take a look at this sample output of the **show ip ospf neighbor** command:

```
router2#show ip ospf neighbor

Neighbor ID     Pri   State     Dead Time   Address         Interface
170.170.5.1     1     INIT/-    00:00:34    170.170.1.1     Serial0
router-2#
```

In this example output, the init state indicates that router−2 sees hello packets from the neighbor, but two−way communication has not been established. A Cisco router includes the Router IDs of all neighbors in the init (or a higher) state in the neighbor field of its hello packets. For two−way communication to be established with a neighbor, a router also must see its own Router ID in the neighbor field of the neighbor's hello packets. In other words, a router with a neighbor in the init state has received hello packets from the neighbor but has not seen its own Router ID in the neighbor's hellos. In this case, if the router does not receive four consecutive

hellos, it tears down the session and the OSPF adjacency goes down.

Possible Causes and Solutions for a Neighbor Stuck in the Init State

The most likely reason that a local router is not listed in a neighbor's hello packets is that the neighbor has not received hello packets from the local router. Possible reasons for this are:

- Use the **ping** and **traceroute** commands to verify that links between routers are operational. If a ping between routers is not successful, the link is not functioning properly and you need to be troubleshoot it. Refer to troubleshooting pages related to Layer 2 technology you are using, such as ISDN, Ethernet, ATM, etc.
- If there are any access lists defined on the neighbor's interface, the destination IP of 224.0.0.5 must be permitted in the input access list.

    - OSPF hello packets have a destination address of 224.0.0.5 (the **all ospf routers multicast** address).
- There might be a second layer or configuration problem affecting multicast packets from reaching the neighboring router. You can test this with the **ping** command on the multicast address 224.0.0.5 and confirm that responses are received from the neighboring router(s). In non−broadcast media such as Frame Relay, X.25, and ISDN, mapping is required between layer 2 and the IP address. In case of static mapping (for example, the interface level **frame−relay map ip 1.1.1.1 100** *broadcast* or **dialer map ip 1.1.1.1** *broadcast* **name router1 55346** commands), you must configure the keyword *broadcast* to avoid encapsulation failure every time OSPF tries to send the multicast hello packet. The **debug ip packet detail** command used with the access list shows if there are any encapsulation failures.
- Authentication is not enabled on both sides. The router on which authentication is not enabled still processes hello packets from the neighbor and sees the neighbor in the init state. In order to correct this problem, enable authentication on both sides.
- If you are running Cisco IOS® Software Release 11.1.9 or earlier, check the output of the **show ip ospf interface** command for discrepancies, such as:

    ```
    Neighbor Count is 0, Adjacent neighbor count is 1
    ```
- If the OSPF adjacent neighbor count is higher than the neighbor count, the neighbor list might be corrupted. Access Cisco bug ID CSCdj01682 (registered customers only) for more information.

Related Information

- **OSPF Neighbor Problems Explained**
- **Open Shortest Path First (OSPF) Introduction**
- **Technical Support − Cisco Systems**

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