

Information About Configuring TCP, UDP Transports

To configure TCP, UDP, and RAW transports, you must understand the following concepts:

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NSR Overview

Nonstop Routing (NSR) is provided for Open Shortest Path First (OSPF), Border Gateway Protocol (BGP), and Label Distribution Protocol (LDP) protocols for the following events:

- Route Processor (RP) failover
- Process restart for either OSPF, LDP, or TCP
- Online insertion removal (OIR)

In the case of the RP failover, NSR is achieved by for both TCP and the applications (OSPF, BGP, or LDP).

Nonstop Routing (NSR) provides high availability for NSR-enabled routing processes by keeping sessions and transport state synchronized between the active and standby RPs. For example, TCP state for NSR-enabled protocols is mirrored so that, on an RP failover, active TCP sessions migrate to the standby RP without notifying peers. If NSR is not available, the protocols on the new active RP must reestablish sessions; Graceful Restart (GR) can reduce traffic loss during failover but has known limitations.

You can use the nsr process-failures switchover command to allow RP failover as a recovery action when an active NSR-enabled process (for example, TCP) restarts. If a standby NSR-enabled process restarts, only NSR capability is lost until the standby instances are up and sessions are resynchronized; the sessions themselves remain up. For an active process failure, a fault-management policy can be used. However, the failing process will not generate the logs required to determine the root cause of the failure.

For more information, refer to Implementing OSPF on Routing Configuration Guide .

Graceful Restart

You can use nonstop forwarding (NSF) for BGP to forward data packets along known routes in the Forward Information Base (FIB) while the BGP routing protocol information is being restored following a failover. With NSF, BGP peers do not experience routing flaps. During a failover, the data traffic is forwarded through intelligent modules while the standby supervisor becomes active.

If a Cisco router experiences a cold reboot, the network does not forward traffic to the router and removes the router from the network topology. In this scenario, BGP experiences a nongraceful restart and removes all routes. When Cisco operating system applies the startup configuration, BGP reestablishes peering sessions and relearns the routes.

A Cisco router that has dual supervisors can experience a stateful supervisor switchover. During the switchover, BGP uses nonstop forwarding to forward traffic based on the information in the FIB, and the system is not removed from the network topology. A router whose neighbor is restarting is referred to as a "helper." After the switchover, a graceful restart operation begins. When it is in progress, both routers reestablish their neighbor relationship and exchange their BGP routes. The helper continues to forward prefixes pointing to the restarting peer, and the restarting router continues to forward traffic to peers although those neighbor relationships are restarting. When the restarting router has all route updates from all BGP peers that are graceful restart capable, the graceful restart is complete, and BGP informs the neighbors that it is operational again.

TCP Overview

TCP is a connection-oriented protocol that specifies the format of data and acknowledgments that two computer systems exchange to transfer data. TCP also specifies the procedures the computers use to ensure that the data arrives correctly. TCP allows multiple applications on a system to communicate concurrently, because it handles all demultiplexing of the incoming traffic among the application programs.

UDP Overview

The User Datagram Protocol (UDP) is a connectionless transport-layer protocol that belongs to the IP family. UDP is the transport protocol for several well-known application-layer protocols, including Network File System (NFS), Simple Network Management Protocol (SNMP), Domain Name System (DNS), and TFTP.

Any IP protocol other than TCP and UDP is known as a RAW protocol.

For most sites, the default settings for the TCP, UDP, and RAW transports need not be changed.

Configuring Failover as a Recovery Action for NSR

When the active TCP or the NSR client of the active TCP terminates or restarts, the TCP sessions go down. To continue to provide NSR, failover is configured as a recovery action. If failover is configured, a switchover is initiated if the active TCP or an active application (for example, LDP, OSPF, and so forth) restarts or terminates.

For information on how to configure MPLS Label Distribution Protocol (LDP) for NSR, refer to the *MPLS Configuration Guide for Cisco NCS 540 Series Routers*.

For information on how to configure NSR on a per-process level for each process, refer to the *Routing Configuration Guide for Cisco NCS 540 Series Routers*.

Configuration Example

Configure failover as a recovery action for active instances to switch over to a standby to maintain nonstop routing.

```
Router#configure
Router(config)#nsr process-failures switchover
Router(config)#commit
```

Running Configuration

```
Router#show running-configuration nsr process-failures switchover
nsr process-failures switchover
```

Associated Commands

- nsr process-failures switchover