Internode Topology Discovery and Communication

This chapter describes how internode topology discovery and communication between NCS 1010 nodes takes place using OSPF.

Internode Topology Discovery and Communication

Optical applications on the NCS 1010 nodes must discover the OLT-OLT link topology. Span level applications must discover the adjacent nodes. Link level applications must learn the complete OLT-OLT link topology. NCS 1010 uses OSPF to discover the link topology and communicate topology information.

The networking devices running OSPF detect topological changes in the network, flood link-state updates to neighbors, and quickly converge on a new view of the topology. Each OSPF router in the network soon has the same topological view again.

Optical applications on NCS 1010 must discover the link topology, the different nodes and the node types, and the optical spectral band the nodes work on. NCS 1010 uses an enhanced version of OSPF that supports a new link-state advertisement attribute that advertises the node type and band.

Configure OSPF

The following commands are the necessary configurations for OSPF on an NCS 1010 OLT node.

configure

router ospf *process-name*

router-id *router-id*

distribute link-state

nsf

network point-to-point

redistribute connected

area *area-id*

interface Loopback1

interface GigabitEthernet0/0/0/0

The following commands are the necessary configurations for OSPF on an NCS 1010 ILA node.

configure

router ospf *process-name*

router-id *router-id*

distribute link-state

nsf

network point-to-point

redistribute connected

area *area-id*

interface Loopback1

interface GigabitEthernet0/0/0/0

interface GigabitEthernet0/0/0/2

Important You must configure router ID during OSPF configuration on NCS 1010 nodes.

See Implementing OSPF, for a description of the concepts and tasks necessary to implement OSPF on Cisco IOS XR.

Configure OSPF cost

Table 1: Feature History

Feature Name	Release Information	Description
Configure OSPF cost	Cisco IOS XR Release 7.11.1	To identify the best route, OSPF path computation uses the link cost. The system calculates the cost based on the available interface bandwidth. From this release onwards, you can set a user-defined cost value using the **cost** *variable* in the **router ospf** command. As a result, this feature enables you to set a specific route when there are two equal-cost routes to the same destination.

Cost is the metric, you can use the cost command to explicitly specify the interface (network) for OSPF path calculation.

configure

router ospf *process-name*

router-id *router-id*

area *area-id*

interface Loopback1

interface GigabitEthernet0/0/0/0

cost *cost*

See cost (OSPF) for different command modes and usage guidelines to implement **cost** OSPF on Cisco IOS XR.

Note The cost of the link is inversely proportional to the bandwidth of the link.

The following example shows a sample **cost** configuration.

```
P/0/RP0/CPU0:ios(config)#router ospf 1

RP/0/RP0/CPU0:ios(config-ospf)#area 0
RP/0/RP0/CPU0:ios(config-ospf-ar)#interface Loopback0
RP/0/RP0/CPU0:ios(config-ospf-ar-if)#interface GigabitEthernet0/0/0/0
RP/0/RP0/CPU0:ios(config-ospf-ar-if)#cost 20
RP/0/RP0/CPU0:ios(config-ospf-ar-if)#commit
```