



# Internode Topology Discovery and Communication

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This chapter describes how internode topology discovery and communication between NCS 1020 nodes takes place using OSPF.

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## Internode Topology Discovery and Communication

Optical applications on the NCS 1020 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 1020 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 1020 must discover the link topology, the different nodes and the node types, and the optical spectral band the nodes work on. NCS 1020 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 1020 OLT node.

**configure**

**router ospf** *process-name*

**router-id** *router-id*

**distribute link-state**

**network point-to-point**

**area** *area-id*

**interface Loopback0**

**interface GigabitEthernet0/0/0/0**

The following commands are the necessary configurations for OSPF on an NCS 1020 ILA node.

```
configure
router ospf process-name
router-id router-id
distribute link-state
network point-to-point
area area-id
interface Loopback0
interface GigabitEthernet0/0/0/0
interface GigabitEthernet0/0/0/2
```




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**Important** You must configure router ID during OSPF configuration on NCS 1020 nodes.

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

## Configure OSPF cost

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 Loopback0
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.




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

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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
```

