I Commands

This chapter describes the Cisco NX-OS Open Shortest Path First (OSPF) commands that begin with I.

ip ospf authentication

To specify the authentication type for an Open Shortest Path First (OSPF) interface, use the **ip ospf authentication** command. To remove the authentication type for an interface, use the **no** form of this command.

ip ospf authentication [**key-chain** *key-name* | **message-digest** | **null**]

no ip ospf authentication

Syntax Description

key-chain *key-name*	(Optional) Specifies a key chain to use for authentication. The *key-name* argument can be a maximum of 63 alphanumeric characters.
message-digest	(Optional) Specifies that message-digest authentication is used.
null	(Optional) Specifies that no authentication is used. Use this keyword to override any other authentication configured for an area.

Command Default

No authentication

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf authentication** command to configure the authentication mode for an OSPF interface. If you use this command with no keywords, use the **ip ospf authentication-key** command to configure the password. If you use the **message-digest** keyword, use the **ip ospf message-digest-key** command to configure the message-digest key for the interface.

The authentication that you configure on an interface overrides the authentication that you configure for the area.

This command requires the LAN Base Services license.

Examples

This example shows how to configure message-digest authentication:

```
switch(config)# interface ethernet 2/1
switch(config-if)# no switchport
switch(config-if)# ip ospf authentication message-digest
switch(config-if)# ip ospf message-digest-key 33 md5 0 mypassword
switch(config-if)#
```

Related Commands

Command	Description
area authentication	Enables authentication for an OSPF area.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf authentication-key	Assigns a password to be used by neighboring routers that are using the password authentication of OSPF.
ip ospf message-digest-key	Configures the OSPF MD5 message-digest key.
show ip ospf	Displays OSPF information.

ip ospf authentication-key

To assign a password for simple password authentication to be used by neighboring Open Shortest Path First (OSPF) routers, use the **ip ospf authentication-key** command. To remove a previously assigned OSPF password, use the **no** form of this command.

ip ospf authentication-key [**0** | **3** | **7**] *password*

no ip ospf authentication-key

Syntax Description

0	(Optional) Configures an unencrypted password.
3	(Optional) Configures a 3DES encrypted password string.
7	(Optional) Configures a Cisco type 7 encrypted password string.
password	Any continuous string of characters that can be entered from the keyboard up to 8 bytes.

Command Default

Unencrypted password

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf authentication-key** command to configure a password for simple password authentication. The password created by this command is used as a key that is inserted directly into the OSPF header when Cisco NX-OS originates routing protocol packets. You can assign a separate password to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to exchange OSPF information.

Note Cisco NX-OS uses this key when you enable authentication for an interface with the **ip ospf authentication** interface configuration command or if you configure the area for authentication with the **area authentication** command in router configuration mode.

This command requires the LAN Base Services license.

Examples

This example shows how to configure an unencrypted authentication key with the string yourpass:

```
switch(config)# interface ethernet 1/5
switch(config-if)# no switchport
switch(config-if)# ip ospf authentication-key yourpass
switch(config-if)#
```

Related Commands

Command	Description
area authentication	Specifies the authentication type for an OSPF area.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf authentication	Specifies the authentication type for an interface.
show ip ospf interface	Displays OSPF information.

ip ospf cost

To specify the cost of sending a packet on an interface, use the **ip ospf cost** command. To reset the path cost to the default, use the **no** form of this command.

ip ospf cost *interface-cost*

no ip ospf cost *interface-cost*

Syntax Description

interface-cost	Unsigned integer value expressed as the link-state metric. The range is from 1 to 65535.

Command Default

Calculates the cost based on the reference bandwidth divided by the configured interface bandwidth. You can configure the reference bandwidth or it defaults to 40 Gb/s.

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf cost** command to configure the cost metric manually for each interface. This command overrides any settings for the reference bandwidth that you set using the **reference-bandwidth** command in router configuration mode.

If this command is not used, the link cost is calculated using the following formula:

link cost = reference bandwidth / interface bandwidth

This command requires the LAN Base Services license.

Examples

This example shows how to configure the interface cost value to 65:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf cost 65
switch(config-if)#
```

Related Commands

Command	Description
reference-bandwidth	Specifies the reference bandwidth that OSPF uses to calculate the link cost.

ip ospf dead-interval

To set the interval during which at least one hello packet must be received from a neighbor before the router declares that neighbor as down, use the **ip ospf dead-interval** command. To restore the default, use the **no** form of this command.

ip ospf dead-interval *seconds*

no ip ospf dead-interval

Syntax Description

seconds	Interval (in seconds) during which the router must receive at least one hello packet from a neighbor or that neighbor adjacency is removed from the local router and does not participate in routing. The range is from 1 to 65535, and the default is 40. The value must be the same for all nodes on the network.

Command Default

The default for *seconds* is four times the interval set by the **ip ospf hello-interval** command.

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf dead-interval** command to set the dead interval that Open Shortest Path First (OSPF) advertises in hello packets. This value must be the same for all networking devices on a specific network.

Configure a shorter dead interval to detect down neighbors faster and improve convergence. Very short dead intervals could cause routing instability.

Use the **show ip ospf interface** command to verify the dead interval and hello interval.

This command requires the LAN Base Services license.

Examples

This example shows how to set the OSPF dead interval to 20 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf dead-interval 20
switch(config-if)#
```

Related Commands

Command	Description
ip ospf hello-interval	Specifies the interval between hello packets that OSPF sends on the interface.
show ip ospf interface	Displays OSPF interface-related information.

ip ospf hello-interval

To specify the interval between hello packets that Open Shortest Path First (OSPF) sends on the interface, use the **ip ospf hello-interval** command. To return to the default, use the **no** form of this command.

ip ospf hello-interval *seconds*

no ip ospf hello-interval

Syntax Description

seconds	Interval (in seconds). The value must be the same for all nodes on a specific network. The range is from 1 to 65535.

Command Default

10 seconds

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf hello-interva**l command to set the rate at which OSPF advertises hello packets. Shorter hello intervals allow OSPF to detect topological changes faster. This value must be the same for all routers and access servers on a specific network.

This command requires the LAN Base Services license.

Examples

This example shows how to set the interval between hello packets to 15 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf hello-interval 15
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf dead-interval	Sets the time period for which hello packets must not have been seen before neighbors declare the router as down.
show ip ospf	Displays OSPF information.

ip ospf message-digest-key

To enable Open Shortest Path First (OSPF) Message Digest 5 (MD5) authentication, use the **ip ospf message-digest-key** command. To remove an old MD5 key, use the **no** form of this command.

ip ospf message-digest-key *key-id* **md5** [**0** | **3** | **7**] *key*

no ip ospf message-digest-key *key-id*

Syntax Description

key-id	Identifier in the range from 1 to 255.
0	(Optional) Specifies an unencrypted password to generate the MD5 key.
3	(Optional) Specifies an encrypted 3DES password to generate the md5 key.
7	(Optional) Specifies a Cisco type 7 encrypted password to generate the MD5 key.
key	Alphanumeric password of up to 16 bytes.

Command Default

Unencrypted

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf message-digest-key** command when you configure the MD5 digest authentication mode. All neighbor routers must have the same *key* value on the network.

This command requires the LAN Base Services license.

Examples

This example shows how to set key 19 with the password 8ry4222:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf message-digest-key 19 md5 8ry4222
switch(config-if)#
```

Related Commands

Command	Description
area authentication	Enables authentication for an OSPF area.
copy running-config startup-config	Saves the configuration changes to the startup configuration file.

Command	Description
ip ospf authentication	Specifies the authentication type for an interface.
show ip ospf	Displays OSPF information.

ip ospf mtu-ignore

To disable Open Shortest Path First (OSPF) maximum transmission unit (MTU) mismatch detection on received Database Descriptor (DBD) packets, use the **ip ospf mtu-ignore** command. To return to the default, use the **no** form of this command.

ip ospf mtu-ignore

no ip ospf mtu-ignore

Syntax Description

This command has no arguments or keywords.

Command Default

OSPF MTU mismatch detection is enabled.

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf mtu-ignore** command to disable MTU mismatch detection on an interface. By default, OSPF checks whether neighbors are using the same MTU on a common interface. If the receiving MTU is higher than the IP MTU configured on the incoming interface, OSPF does not establish adjacencies. Use the **ip ospf mtu-ignore** command to disable this check and allow adjacencies when the MTU value differs between OSPF neighbors.

This command requires the LAN Base Services license.

Examples

This example shows how to disable MTU mismatch detection on received DBD packets:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf mtu-ignore
switch(config-if)#
```

Related Commands

Command	Description
show ip ospf	Displays general information about OSPF routing instances.
show ip ospf interface	Displays OSPF-related interface information.

ip ospf network

To configure the Open Shortest Path First (OSPF) network type to a type other than the default for an interface, use the **ip ospf network** command. To return to the default, use the **no** form of this command.

ip ospf network {**broadcast** | **point-to-point**}

no ip ospf network

Syntax Description

broadcast	Sets the network type as broadcast.
point-to-point	Sets the network type as point-to-point.

Command Default

Depends on the network type.

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

The network type influences the behavior of the OSPF interface. An OSPF network type is usually broadcast, which uses OSPF multicasting capabilities. Under this network type, a designated router and backup designated router are elected. For point-to-point networks, there are only two neighbors and multicast is not required. For routers on an interface to become neighbors, the network type for all should match.

This command overrides the **medium** {**broadcast** | **p2p**} command in interface configuration mode.

This command requires the LAN Base Services license.

Examples

This example shows how to set an OSPF network as a broadcast network:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip address 192.0.2.33 255.255.255.0
switch(config-if)# ip ospf network broadcast
switch(config-if)#
```

Related Commands

Command	Description
show ip ospf	Displays general information about OSPF routing instances.
show ip ospf interface	Displays OSPF-related interface information.

ip ospf passive-interface

To suppress Open Shortest Path First (OSPF) routing updates on an interface, use the **ip ospf passive-interface** command. To return to the default, use the **no** form of this command.

ip ospf passive-interface

no ip ospf passive-interface

Syntax Description

This command has no arguments or keywords.

Command Default

Disabled

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

If an interface is configured as a passive interface, it does not participate in OSPF and does not establish adjacencies or send routing updates. However, the interface is announced as part of the routing network.

This command requires the LAN Base Services license.

Examples

This example shows how to set an interface as passive:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf passive-interface
switch(config-if)#
```

Related Commands

Command	Description
show ip ospf	Displays general information about OSPF routing instances.
show ip ospf interface	Displays OSPF-related interface information.

ip ospf priority

To set the router priority for an Open Shortest Path First (OSPF) interface, use the **ip ospf priority** command. To return to the default, use the **no** form of this command.

ip ospf priority *number-value*

no ip ospf priority *number-value*

Syntax Description

number-value	Number that specifies the priority of the router. The range is from 0 to 255.

Command Default

Priority of 1

Command Modes

Release / Modification

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf priority** command to set the router priority, which determines the designated router for this network. When two routers are attached to a network, both attempt to become the designated router. The router with the higher router priority takes precedence. If there is a tie, the router with the higher router ID takes precedence. A router with a router priority set to zero cannot become the designated router or backup designated router.

Cisco NX-OS uses this priority value when you configure OSPF for broadcast networks using the **neighbor** command in router configuration mode.

This command requires the LAN Base Services license.

Examples

This example shows how to set the router priority value to 4:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf priority 4
switch(config-if)#
```

Related Commands

Command	Description
ip ospf network	Configures the OSPF network type to a type other than the default for a given medium.

ip ospf retransmit-interval

To specify the time between Open Shortest Path First (OSPF) link-state advertisement (LSA) retransmissions for adjacencies that belongs to the interface, use the **ip ospf retransmit-interval** command. To return to the default, use the **no** form of this command.

ip ospf retransmit-interval *seconds*

no ip ospf retransmit-interval

Syntax Description

seconds	Time (in seconds) between retransmissions. The time must be greater than the expected round-trip delay between any two routers on the attached network. The range is from 1 to 65535 seconds. The default is 5 seconds.

Command Default

5 seconds

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf retransmit-interval** command to set the time between LSA retransmissions. When a router sends an LSA to its neighbor, it keeps the LSA until it receives an acknowledgment message from the neighbor. If the router receives no acknowledgment within the retransmit interval, the local router resends the LSA.

This command requires the LAN Base Services license.

Examples

This example shows how to set the retransmit interval value to 8 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf retransmit-interval 8
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf transmit-delay	Sets the estimated time to transmit an LSA to a neighbor.
show ip ospf	Displays OSPF information.

ip ospf shutdown

To shut down an Open Shortest Path First (OSPF) interface, use the **ip ospf shutdown** command. To return to the default, use the **no** form of this command.

ip ospf shutdown

no ip ospf shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf shutdown** command to shut down OSPF on this interface.

This command requires the LAN Base Services license.

Examples

This example shows how to shut down OSPF on an interface:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf shutdown
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf	Displays OSPF information.

ip ospf transmit-delay

To set the estimated time required to send an Open Shortest Path First (OSPF) link-state update packet on the interface, use the **ip ospf transmit-delay** command. To return to the default, use the **no** form of this command.

ip ospf transmit-delay *seconds*

no ip ospf transmit-delay

Syntax Description

seconds	Time (in seconds) required to send a link-state update. The range is from 1 to 450 seconds, and the default is 1.

Command Default

1 second

Command Modes

Release / Modification

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip ospf transmit-delay** command to set the estimated time needed to send an LSA update packet. OSPF increments the LSA age time by the transmit delay amount before transmitting the LSA update. You should take into account the transmission and propagation delays for the interface when you set this value.

This command requires the LAN Base Services license.

Examples

This example shows how to set the transmit delay value to 8 seconds:

```
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip ospf transmit-delay 8
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
ip ospf retransmit-interval	Sets the estimated time between LSAs transmitted from this interface.
show ip ospf	Displays OSPF information.

ip router ospf area

To specify the Open Shortest Path First (OSPF) instance and area for an interface, use the **ip router ospf area** command. To return to the default, use the **no** form of this command.

ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]

no ip router ospf *instance-tag* **area** *area-id* [**secondaries none**]

Syntax Description

instance-tag	Instance tag. The *instance-tag* can be an alphanumeric string of 20 characters.
area-id	Identifier for the OSPF area where you want to enable authentication. The area ID can be either a positive integer value from 0 to 4294967295 or an IP address.
secondaries none	(Optional) Excludes secondary IP addresses.

Command Default

10 seconds

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Use the **ip router ospf area** command to specify the area and OSPF instance for the interface.

This command requires the LAN Base Services license.

Examples

This example shows how to configure an interface for OSPF:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip router ospf Base area 33
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
show ip ospf interface	Displays OSPF interface-related information.

ip router ospf multi-area

To configure a multi-area adjacency on an Open Shortest Path First (OSPF) interface, use the **ip router ospf multi-area** command. To return to the default, use the **no** form of this command.

ip router ospf *instance-tag* **multi-area** *area-id*

no ip router ospf *instance-tag* **multi-area** *area-id*

Syntax Description

instance-tag	Instance tag. Specify as an case-sensative alphanumeric string up to 20 characters.
area-id	Identifier for the OSPF area where you want to add as another area to the primary interface. The area ID can be either a positive integer value from 0 to 4294967295 or an IP address.

Command Default

None

Command Modes

Release	Modification
5.0(3)N1(1)	This command was introduced.

Usage Guidelines

Before you use this command, make sure that you enable OSPF on the switch.

This command requires the LAN Base Services license.

Examples

This example shows how to configure a multi-area adjacency:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip router ospf Base area 33
switch(config-if)# ip router ospf Base multi-area 99
switch(config-if)#
```

Related Commands

Command	Description
copy running-config startup-config	Saves the configuration changes to the startup configuration file.
feature ospf	Enables OSPF on the switch.
show ip ospf interface	Displays OSPF interface-related information.