

OSPF VRF Configuration Mode Commands

Command Modes

The OSPF VRF Configuration sub-mode is used to configure the virtual routing and forwarding (VRF) context instances for OSPF routing protocol. This mode includes commands that configure VRF instance for OSPF routing parameters.

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Important The commands or keywords/variables that are available are dependent on platform type, product version, and installed license(s).

Important For information on common commands available in this configuration mode, refer to the Common Commands chapter.

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area

Configures various parameters, including authentication, area identification, virtual link ID, and delay/interval values for the specified OSPF area using a specific VRF instance.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

[no] area { *decimal_value* **|** *ip_address* **} {authentication [message-digest] | default-cost** *cost_value* **| nssa [default-information-originate] [no-redistribution] [no-summary] [translate-always] [translate-candidate] [translate-never] | stub [no-summary] | virtual-link** *router_ip_address* **[authentication {message-digest | null | text}| authentication-key {encrypted password** *encrypted_string* **| password** *password_string***}| message-digest-key** *key_id* **md5 [encrypted password** *encrypted_string* **| password** *password_string***]} [dead-interval] [hello-interval] [retransmit-interval] [transmit-delay]**

no

Disables or removes configured parameters for the specified OSPF area using a specific VRF instance.

ip_address

Specifies the IP address of the area where authentication will be enabled in IPv4 dotted-decimal notation.

decimal_value

Specifies the identification number of the area where parameters to be configured as an integer from 0 through 4294967295.

authentication

Sets the OSPF authentication type to use the simple authentication method.

message-digest

Sets the OSPF authentication type to use the message digest 5 (MD5) authentication method.

default-cost *cost_value*

Sets the default cost for an OSPF area. *cost_value* must be an integer from 0 through 16777215.

nssa [default-information-originate] [no-redistribution no-summary] [translate-always] [translate-candidate] [translate-never]

Configures and defines an area as an NSSA (Not So Stubby Area) and configures OSPF parameters for it.

default-information-originate: Configures the OSPF VRF instances to originate default information to the NSSA area.

no-redistribution: Configures the OSPF VRF instance to not to redistribute external routes to the NSSA area.

no-summary: Configures the OSPF VRF instance to not to inject the inter-area routes into NSSA.

translate-always: Configures the NSSA-ABR (Area Border Router) always to translate. By default this is disabled.

translate-candidate: Configures the NSSA-ABR always to translate election. By default this is enabled.

translate-never: Configures the NSSA-ABR never to translate. By default this is disabled.

stub [no-summary]

Specifies an OSPF area as an stub area configures the NSSA-ABR never to translate. By default this is disabled.

no-summary: Disables (stops) the ABR from sending summary LSAs into the stub area.

virtual-link *router_id*

Specifies the router identifier which provides a virtual link between an area that cannot be physically connected to the network backbone and an area that is physically connected to the network backbone.

router_id must be an IP address in IPv4 dotted-decimal notation of the ABR to be linked to.

authentication {message-digest | null | text}

Configures the OSPF authentication method to be used by the virtual link between an area that cannot be physically connected to the network backbone and an area that is physically connected to the network backbone.

message-digest: Set the OSPF authentication type to use the message digest (MD) authentication method.

null: Set the OSPF authentication type to use no authentication, thus disabling either MD or clear text methods.

text: Set the OSPF authentication type to use the clear text authentication method.

authentication-key

Configures the authentication password for the virtual link between an area that cannot be physically connected to the network backbone and an area that is physically connected to the network backbone.

message-digest-key *key_id*

Specifies the MD key identifier number for virtual link connection. *key_id* must be an integer from 1 through 255.

md5

Sets the message digest to MD5 for virtual link connection.

[encrypted] password *passwd_string*

Specifies the password required for virtual link connection authentications. The keyword **password** is optional and if specified *passwd_string* must be an alphanumeric string of 1 through 63 characters. The password specified must be in an encrypted format if the optional keyword **encrypted** was specified.

The **encrypted** keyword is intended only for use by the system while saving configuration scripts. The system displays the **encrypted** keyword in the configuration file as a flag that the variable following the **password** keyword is the encrypted version of the plain text password. Only the encrypted password is saved as part of the configuration file. *encrypted_string* is an alphanumeric string of 1 through 523 characters.

dead-interval *value*

Specifies the dead interval (in seconds) that the router should wait, during which time no packets are received and after the router considers a neighboring router to be off-line. *value* must be an integer from 1 through 65535.

hello-interval *value*

Specifies the hello interval (in seconds) before sending a hello packet. *value* must be an integer from 1 through 65535.

retransmit-interval *value*

Specifies the delay between retransmission (in seconds) that router should wait before retransmitting a packet. *value* must be an integer from 1 through 3600.

transmit-delay *value*

Specifies the interval (in seconds) that the router should wait before transmitting a packet. *value* must be an integer from 1 through 3600.

Usage Guidelines

Use this command to configure/set the various network/connection/authentication parameters of OPSF areas using specific VRF instance.

Example

The following command enables authentication for an OSPF area defined by the IP address *192.168.100.10* and the OSPF authentication type to MD5:

```
area 192.168.100.10 authentication message-digest
```

The following command defines the area designated by the IP address *192.168.100.10* as an NSSA area where translation of NSSA candidate is enabled by default:

```
area 192.168.100.10 nssa
```

The following command defines the OSPF area defined by the IP address *192.168.100.10* as a stub area:

```
area 192.168.100.10 stub
```

The following command creates a virtual link between the OSPF areas defined by the IP address *192.168.100.10* and the IP address *192.168.200.20*:

```
area 192.168.100.10 virtual-link 192.168.200.20
```

The following command sets the authentication method for a virtual link between the OSPF areas defined by the IP address *192.168.100.10* and the IP address *192.168.200.20* to use no authentication:

```
area 192.168.100.10 virtual-link 192.168.200.20 null
```

The following command creates an authentication password of *123456* for a virtual link between the OSPF areas defined by the IP address *192.168.100.10* and the IP address *192.168.200.20*:

```
area 192.168.100.10 virtual-link 192.168.200.20 authentication-key password
 123456
```

The following command enables the use of MD5-based OSPF authentication for a virtual link between the OSPF areas defined by the IP address *192.168.100.10* and the IP address *192.168.200.20*, sets the MD5 Key ID to *25*, and the password to *123456*:

```
area 192.168.100.10 virtual-link 192.168.200.20 message-digest-key 25 md5
 password 123456
```

The following command sets the retransmit interval for a virtual link between the OSPF areas defined by the IP address *192.168.100.10* and the IP address *192.168.200.20* to *60* seconds:

```
area 192.168.100.10 virtual-link 192.168.200.20 retransmit-interval 60
```

default-information originate

Creates a default external route into an OSPF routing domain.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

default-information originate [**always**] [**metric** *metric_value*] [**metric-type** { **1** | **2** }] [**route-map** *route_map_name*]
no default-information originate

no

Disables the default external route.

always

Always advertise the route regardless of whether or not the software has a default route.

metric *metric_value*

Sets the OSPF metric used in creating the default rout as an integer from 1 through 16777214.

metric-type { 1 | 2 }

Sets the default route metric type.

1: Sets the OSPF external link type for default routes to Type 1.

2: Sets the OSPF external link type for default routes to Type 2.

route-map *route_map_name*

Specifies the name of the default route-map to be use as an alphanumeric string of 1 through 79 characters.

Usage Guidelines

Use this command to set the default external route into an OSPF routing domain.

Example

The following command sets the default external route to originate from the route map named *rmap1*:

```
default-information originate route-map rmap1
```

default-metric

Configures the default metric value for the OSPF routing protocol.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
default-metric metric_value
no default-metric
```

metric_value

Sets the metric value expressed as an integer from 1 through 16777214. The default metric value setting is 26385.

no

Enables or disables the default metric value for OSPF.

Usage Guidelines

Use this command to set the default metric for routes.

Example

The following command sets the default metric to *235*:

```
default-metric 235
```

distance

Configures the OSPF route administrative distances for all OSPF route types or based on specific route type. Administrative distance is the measure used by Cisco routers to select the best path when there are two or more different routes to the same destination from two different routing protocols. Administrative distance defines the reliability of a routing protocol. Each routing protocol is prioritized in order of most to least reliable (believable) using an administrative distance value. A lower numerical value is preferred.

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Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
[ no ] distance { distance_value | ospf { [ external distance_value ] [ inter-area
 distance_value ] [ intra-area distance_value ] } }
```

no

Disables the soecified option.

distance_value

Specifies the OSPF route administrative distances as an integer from 1 to 255. The default distance value is 110.

external *ext_distance_value*

Sets the OSPF route administrative distance for routes from other routing domains, learned by redistribution. *ext_distance_value* must be an integer from 1 through 255. The default is 110.

inter-area *inter_distance_value*

Sets the OSPF route administrative distance for routes from one routing area to another. *inter_distance_value* must be an integer from 1 through 255. The default is 110.

intra-area *intra_distance_value*

Sets the OSPF route administrative distance for all routes within an area. *intra_distance_value* must be an integer from 1 through 255. The default is 110.

Usage Guidelines

Use this command to set the administrative distance for OSPF routes.

Example

The following command sets the administrative distance for all OSPF route types to *30*:

```
distance 30
```

distribute-list

Enables or disables the filtering of networks in outgoing routing updates.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
[ no ] distribute-list route_access_list out { connected | rip | static }
```

no

Disables the filtering of networks in outgoing routing updates.

route_access_list

Specifies the name of the OSPF route access list to use for filtering as an alphanumeric string of 1 through 63 characters.

connected

Filters connected routes.

rip

Filters RIP routes. (RIP is not supported at this time.)

static

Filters static routes.

Usage Guidelines

Use this command to enable the filtering of outgoing route updates by using the specified route access list.

Example

The following command uses the route access list named *ral1* to filter outgoing routing updates for all connected routes:

```
distribute-list ral1 out connected
```

neighbor

Configures OSPF routers that interconnect to non-broadcast networks.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

[no] neighbor *ip_address* **[poll-interval** *poll_interval_value* **] [priority** *priority_value* **]**

no

Disables OSPF routers that interconnect to non-broadcast networks.

ip_address

Specifies the interface IP address of the OSPF neighbor expressed using IPv4 dotted-decimal notation.

poll-interval *poll_interval_value*

Default: 120

Sets the number of seconds in the dead neighbor polling interval as an integer from 1 through 65535

priority *priority_value*

Default: 0

Sets the 8-bit number that represents the router priority value of the non-broadcast neighbor associated with the specified IP address. This must be an integer from 0 through 255. This keyword does not apply to point-to-multipoint interfaces.

Usage Guidelines

Use this command to configure OSPF routers that connect to non-broadcast networks.

Example

The following command specifies an OSPF router neighbor with the IP address of *192.168.100.10*:

```
neighbor 192.168.100.10
```

network

Enables OSPF on an interface and defines the OSPF area for that network.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

`[ no ] network` *`network_ip_address/mask`* `area {` *`area_id`*`|` *`area_ip_address`* `}`

no

Disables OSPF on an interface and defines the OSPF area for that network.

network_ip_address/mask

Specifies the network address and mask as well as the interface on which OSPF will be enabled. *network_ip_address* in entered in IPv4 dotted-decimal notation, followed by the "/" and the mask in CIDR notation.

area_id

Specifies the OSPF area identification number for the specified network as an integer from 0 through 4294967295.

area_ip_address

Specifies the IP address of the OSPF area for this network. This must be entered in IPv4 dotted-decimal notation.

Usage Guidelines Use this command to specify the IP address of the network interface that the OSPF router will use.

Example

The following command specified that the OSPF router will use the interface at IP address 192.168.1.0 /24 an area ID 2345 and IP address 192.168.1.5:

```
network 192.168.1.0/24 area 2345 192.168.1.5
```

ospf router-id

Configures the router ID for the OSPF process.

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Command Modes Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description **`[ no ] ospf router-id`** *`ip_address`*

no

Disables the specified OSPF router.

ip_address

Specifies the router ID for the OSPF process as an IP address entered using IPv4 dotted-decimal notation

Usage Guidelines Use this command to set the router ID for the current OSPF router process.

Example

The following command sets the router ID to *192.168.200.1*:

```
ospf router-id 192.168.200.1
```

passive-interface

Enables or disables the suppression of OSPF routing updates on the specified interface.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

[no] passive-interface *interface_name*

no

Disables the name assigned to a logical interface within the specific context.

interface_name

Specifies the name assigned to a logical interface within the context as an alphanumeric string of 1 through 79 characters.

Usage Guidelines

Use this command to suppress router updates on an interface in the current context.

Example

The following command suppresses OSPF routing updates on the interface named *Intfc1*:

```
passive-interface Intfc1
```

redistribute

Redistributes routes from other protocols to OSPF neighbors using the OSPF protocol.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > **context** *context_name* > **router ospf** > **ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
redistribute { connected | rip | static } [ metric metric_value ] [ metric-type { 1 | 2 } ] [ route-map route_map_name ]
no redistribute { connected | rip | static }
```

no

Disables the redistributed routes.

connected

Redistributes connected routes.

rip

Specifies that RIP routes will be redistributed. (RIP is not supported at this time.)

static

Redistributes static routes.

metric *metric_value*

Sets the OSPF metric used in the redistributed route. This must be an integer from 1 through 16777214.

metric-type { 1 | 2 }

Default: 2

Sets route metric type that is applied to redistributed routes.

1: Sets the OSPF external link type for routes to Type 1.

2: Sets the OSPF external link type for routes to Type 2.

route-map *route_map_name*

Filter routes through the specified route map before redistribution. *route_map_name* specifies the name of the route-map to use as an alphanumeric string of 1 through 79 characters.

Usage Guidelines

Use this command to define what routing protocols should have their routes redistributed into OSPF.

Example

The following command defines that BGP routes should be redistributed:

```
redistribute connected
```

refresh timer

Adjusts settings for the OSPF refresh timer.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

[no] refresh timer *value*

no

Disables the refresh timer.

value

Default: 10

Specifies the minimum amount of time (in seconds) to wait before refreshing a Link-state Advertisement (LSA). This must be an integer from 10 through 1800.

Usage Guidelines

Use this command to define the amount of time to wait before refreshing an LSA.

Example

The following command sets the refresh timer to *90* seconds:

```
refresh timer 90
```

router-id

Configures the router ID for the OSPF process.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
[ no ] router-id ip_address
```

no

Disables the router ID for the OSPF process.

ip_address 92

Specifies the router ID for the OSPF process in IPv4 dotted-decimal notation.

Usage Guidelines

Use this command to set the router ID for the current OSPF router process.

Example

The following command sets the router ID to *192.168.200.1*:

```
router-id 192.168.200.1
```

timers spf

Sets the Shortest Path First (SPF) timers.

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Command Modes

Exec > Global Configuration > Context Configuration > OSPF Configuration > OSPF VRF Configuration

configure > context *context_name* **> router ospf > ip vrf** *vrf_name*

Entering the above command sequence results in the following prompt:

```
[local]host_name(config-ospf-vrf)#
```

Syntax Description

```
timers spf delay_value hold_time_value
no timers spf
```

no

Disables SPF timers.

delay_value

Default: 5

Specifies the delay time (in seconds) between receiving changes to an SPF calculation. This must be an integer from 0 through 4294967295.

hold_time_value

Default: 10

Specifies the hold time (in seconds) between consecutive SPF calculations. This must be an integer from 0 through 4294967295.

Usage Guidelines

Use this command to set the SPF delay and hold timers for the current OSPF router process.

Example

The following command sets the delay timer to *15* and the hold timer to *15*:

```
timers spf 15 15
```