IP Routing Protocols Commands

This section describes the function and displays the syntax of each IP routing command. For more information about defaults and usage guidelines, see the corresponding chapter of the *Router Products Command Reference* publication.

[**no**] **aggregate-address** *address mask* [**as-set**] [**summary-only**]
   [**suppress-map** *map-name*]

Use the **aggregate-address** router configuration command to create an aggregate entry in a BGP routing table. Use the **no** form of this command to disable this feature.

address	Aggregate address.
mask	Aggregate mask.
as-set	(Optional) Generate autonomous system set path information.
summary-only	(Optional) Filter more specific routes from updates.
suppress-map *map-name*	(Optional) Name of route-map to suppress.

[**no**] **area** *area-id* **authentication**
no area *area-id*

Use the **area authentication** router configuration command to enable authentication for an OSPF area. The **no** form of this command with the **authentication** keyword removes the area's authentication specification.

The **no** form of this command removes the specified area from the router's configuration.The default is Type 0 authentication (no authentication).

> *area-id*   Identifier of the area for which authentication is to be enabled. The identifier can be specified as either a decimal value or an IP address.

[**no**] **area** *area-id* **default-cost** *cost*

Use the **area default-cost** router configuration command to specify a cost for the default summary route sent into a stub area. Use the **no** form of this command to remove the assigned default route cost.

> *area-id*   Identifier for the stub area. The identifier can be specified as either a decimal value or as an IP address.
>
> *cost*   Cost for the default summary route used for a stub area. The acceptable value is a 24-bit number. The default cost is 1.

[**no**] **area** *area-id* **range** *address mask*

Use the **area range** router configuration command to consolidate and summarize routes at an area boundary. Use the **no** form of this command to disable this function for the specified area.

> *area-id*   Identifier of the area about which routes are to be summarized. It can be specified as either a decimal value or as an IP address.
>
> *address*   IP address.
>
> *mask*   IP mask.

[**no**] **area** *area-id* **stub**

Use the **area stub** router configuration command to define an area as a stub area. Use the **no** form of the command to disable this function for the specified area. By default, no stub area is defined.

area-id	Identifier (ID) for the stub area. The identifier can be either a decimal value or an IP address.

[**no**] **area** *area-id* **virtual-link** *router-id* [**hello-interval** *seconds*] [**retransmit-interval** *seconds*] [**transmit-delay** *seconds*] [**dead-interval** *seconds*] [**authentication-key** *password*]

Use the **area virtual-link** router configuration command with the optional parameters to define an OSPF virtual link. Use the **no** form of this command to remove the virtual link.

area-id	Area ID assigned to the transit area for the virtual link. This can be either a decimal value or a valid IP address. There is no default.
router-id	Router ID associated with the virtual link neighbor. The router ID appears in the **show ip ospf** display. It is internally derived by each router from the router's interface IP addresses. This value must be entered in the format of an IP address. There is no default.
hello-interval	(Optional) Number of seconds between the hello packets that the router sends on an interface.
seconds	(Optional) Unsigned integer value to be advertised in the router's hello packets. The value must be the same for all routers attached to a common network. The default is 10 seconds.
retransmit-interval	(Optional) Number of seconds between link state advertisement retransmissions for adjacencies belonging to the interface.

seconds	(Optional) Expected round-trip delay between any two routers on the attached network. The value must be greater than the expected round-trip delay. The default is 5 seconds.
transmit-delay	(Optional) Estimated number of seconds it takes to transmit a link state update packet on the interface.
seconds	(Optional) Integer value that must be greater than zero. Link state advertisements in the update packet have their age incremented by this amount before transmission. The default value is 1 second.
dead-interval	(Optional) Number of seconds that a router's hello packets are not seen before its neighbors declare the router down.
seconds	(Optional) Unsigned integer value. The default is four times the hello interval. As with the hello interval, this value must be the same for all routers attached to a common network.
authentication-key	(Optional) Specific password to be used by neighboring routers.
password	(Optional) Any continuous string of characters, up to 8 bytes long, that you can enter from the keyboard. This string acts as a key that will allow the authentication procedure to generate or verify the authentication field in the OSPF header. This key is inserted directly into the OSPF header when originating routing protocol packets. A separate password can be assigned to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to route OSPF traffic. There is no default value.

area-password *password*
no area-password [*password*]

Use the area-password router configuration command to configure the IS-IS area authentication password. The **no area-password** command disables the password. By default, no area password is defined.

    password   Password you assign

[**no**] **auto-summary**

Use the **auto-summary** router configuration command to automatically summarize subnet information into a single network advertisement. Use the **no auto-summary** command to disable this function.

[**no**] **autonomous-system** *local-as*

Use the **autonomous-system** global configuration command to specify the local autonomous system that the router resides in for EGP. To remove the autonomous system number, use the **no** form of this command. By default, no local autonomous system is specified.

    local-as   Local autonomous system number to which the
                      router belongs.

[**no**] **bgp default local-preference** *value*

Use the bgp **default local-preference** command to change the default local preference value of 100. The **no** form of this command reverts to the default setting.

    value   Local preference value. Higher is more preferred.
              Integer from 0 through 4294967295.

[no] bgp fast-external-fallover

Use the **bgp fast-external-fallover** router configuration command to immediately reset the BGP sessions of any directly adjacent external peers if the link used to reach them goes down. Use the **no** form of this command to disable this feature.

clear arp-cache

Use the **clear arp-cache** EXEC command to remove all dynamic entries from the ARP cache and to clear the fast-switching cache.

clear ip bgp {***** | *address*}

To reset a BGP connection, use the **clear ip bgp** EXEC command at the system prompt.

*	Resets all current BGP sessions.
address	Resets only the identified BGP neighbor.

clear ip route {*network* [*mask*] | *****}

Use the **clear ip route** EXEC command to remove one or more routes from the IP routing table.

network	Network or subnet address to remove.
mask	(Optional) Network mask associated with the IP address you wish to remove.
*	Removes all entries.

[no] default-information allowed {**in** | **out**}

Use the **default-information allowed** router configuration command to control exterior information between IGRP processes. The **no default-information allowed in** command causes IGRP exterior or default routes to be suppressed when received by an IGRP process. The **no default-information allowed out** command causes IGRP exterior

routes to be suppressed in updates. Normally, exterior routes are always accepted and default information is passed between IGRP processes when doing redistribution.

in	Allows IGRP exterior or default routes to be received by an IGRP process.
out	Allows IGRP exterior routes to be advertised in updates.

[no] default-information originate

Use the **default-information originate** router configuration command to allow the redistribution of network 0.0.0.0 into BGP. Use the **no** form of this command disables this function.

[**no**] **default-information originate** [**always**] [**metric** *metric-value*]
   [**metric-type** *type-value*] {**level-1** | **level-1-2** | **level-2**}
   [**route-map** *map-name*]

Use the **default-information originate** router configuration command to
generate a default route into an OSPF or IS-IS routing domain. The **no**
form of this command disables generation of a default route into the
specified OSPF or IS-IS routing domain.

originate	For OSPF, causes the router to generate a default external route into an OSPF domain if the router already has a default route and you want to propagate to other routers. For IS-IS, originates the default route whether or not it resides in the routing table.
always	(Optional) For OSPF, the default route always will be advertised whether or not the router has a default route.
metric *metric-value*	(Optional) Metric used for generating the default route. If a value is not specified for this option, and no value is specified using the **default-metric** router configuration command, the default metric value is 1. The value used is specific to the protocol.
metric-type *type-value*	(Optional) For OSPF, the external link type associated with the default route advertised into the OSPF routing domain. It can be one of two values: **1**—Type 1 external route **2**—Type 2 external route If a **metric-type** is not specified, the router adopts a Type 2 external route. For IS-IS, it can be one of two values: **internal**—IS-IS metric which is < 63. **external**—IS-IS metric which is > 64 < 128. The default is **internal**.

level-1	For IS-IS only, Level 1 routes are redistributed into other IP routing protocols independently. It specifies if IS-IS advertises network 0.0.0.0 into the Level 1 area.
level-1-2	For IS-IS only, both Level 1 and Level 2 routes are redistributed into other IP routing protocols. It specifies if IS-IS advertises network 0.0.0.0 into both levels in a single command.
level-2	For IS-IS only, Level 2 routes are redistributed into other IP routing protocols independently. It specifies if IS-IS advertises network 0.0.0.0 into the Level 2 subdomain.
route-map *map-name*	(Optional) Routing process will generate the default route if the route-map is satisfied.

[**no**] **default-metric** *number*

Use the **default-metric** router configuration command to set default metric values for the RIP, EGP, and BGP routing protocols. Use the **no** form of this command to remove the metric value and return to the default state. The default is to use built-in, automatic metric translations, as appropriate for each routing protocol.

number	Default metric value appropriate for the specified routing protocol

[**no**] **default-metric** *bandwidth delay reliability loading mtu*

Use this form of the **default-metric** router configuration command to set metrics for IGRP. Use the **no** form of this command to remove the metric value and return to the default state. The default is to use built-in, automatic metric translations.

bandwidth	Minimum bandwidth of the route in kilobits per second
delay	Route delay in tens of microseconds
reliability	Likelihood of successful packet transmission expressed as a number between 0 and 255 (255 is 100 percent reliability)
loading	Effective bandwidth of the route in kilobits per second
mtu	Minimum Maximum Transmission Unit (MTU) size of the route

[**no**] **distance** *weight* [*address mask* [*access-list-number*]] [**ip**]

Use the **distance** router configuration command to define an administrative distance. Use the **no distance** command with the appropriate arguments to remove a distance definition. See the default administrative distances table in the *Router Products Command Reference* publication for default administrative distances.

weight	Integer from 10 to 255 for the administrative distance. (Values 0 through 9 are reserved for internal use.) Used alone, the argument specifies a default administrative distance that the router uses when no other specification exists for a routing information source.
address	(Optional) IP address.
mask	(Optional) In dotted-decimal format which bits, if any, to ignore in the address value; a set bit in the *mask* argument instructs the router to ignore the corresponding bit in the address value.
access-list-number	(Optional) Number of a standard IP access list to be applied to incoming routing updates.
ip	(Optional) IP-derived routes for IS-IS. Can be applied independently for IP routes and ISO CLNS routes.

distance bgp *external-distance internal-distance local-distance*
no distance bgp

Use the **distance bgp** router configuration command to allow the use of three possible administrative distances—external, internal, and local—that could be a better route to a node. Use the **no** form of this command to reset these values to their defaults.

external-distance	Administrative distance for BGP external routes. External routes are routes for which the best path is learned from a neighbor external to the autonomous system. Acceptable values are from 1 to 255. The default is 20.
internal-distance	Administrative distance for BGP internal routes. Internal routes are those routes that are learned from another BGP entity within the same autonomous system. Acceptable values are from 1 to 255. The default is 200.
local-distance	Administrative distance for BGP local routes. Local routes are those networks listed with a **network** router configuration command, often as back doors, for that router or for networks that are being redistributed from another process. Acceptable values are from 1 to 255. The default is 200.

[**no**] **distribute-list** *access-list-number* **in** [*interface-name*]

Use the **distribute-list in** router configuration command to filter networks received in updates. (Not supported in IS-IS.) Use the **no** form of this command to disable this function.

access-list-number	Standard IP access list number. The list explicitly specifies which networks are to be received and which are to be suppressed.
interface-name	(Optional) Interface on which the access list should be applied to incoming updates. If no interface is specified, the access list will be applied to all incoming updates.

[**no**] **distribute-list** *access-list-number* **out** {*interface-name* | *routing-process*}

Use the **distribute-list out** router configuration command to suppress networks from being advertised in updates**.** Use the **no** form of this command to disable this function.

access-list-number	Standard IP access list number. The list explicitly specifies which networks are to be sent and which are to be suppressed in routing updates.
interface-name	Name of a particular interface. Does not apply to OSPF.
routing-process	Name of a particular routing process, or **static** or **connected**.

[**no**] **domain-password** [*password*]

Use the **domain-password** router configuration command to configure the IS-IS routing domain authentication password. Use the **no** form of this command to disable the password.

password	Password you assign

[**no**] **ip address** *address mask* [**secondary**]

Use the **ip address** interface configuration command to specify the IP address on an interface. The **no** form of this command removes the specified secondary address.

address	IP address
mask	IP address mask
secondary	(Optional) Address to be added as a secondary address

[**no**] **ip as-path access-list** *access-list-number* {**permit** | **deny**} *as-regular-expression*

Use the **ip as-path access-list** global configuration command to define a BGP-related access list. To disable use of the access list, use the **no** form of this command.

access-list-number	Integer from 1 to 199 that indicates the regular expression access list number.
permit	Permits access for matching conditions.
deny	Denies access to matching conditions.
as-regular-expression	Autonomous system in the access list using a regular expression. See the "Regular Expressions" appendix of the *Router Products Command Reference* publication for information on forming regular expressions.

[**no**] **ip default-network** *network-number*

Use the **ip default-network** global configuration command to select a network as a candidate route for computing the gateway of last resort. Use the **no default-network** command to remove the route.

network-number	Number of the network

ip gdp [**priority** *number* | **reporttime** *seconds* | **holdtime** *seconds*]
no ip gdp

Use any of the **ip gdp** interface configuration command to enable GDP routing on an interface. Use the **no** form of this command to disable GDP routing, with all default parameters.

priority *number*	(Optional) Alters the GDP priority; default is a priority of 100. A larger number indicates a higher priority. The default is 100.
reporttime *seconds*	(Optional) Alters the GDP reporting interval; the default is 5 seconds for broadcast media such as Ethernet, and never for nonbroadcast media such as X.25. The default is 5 seconds for broadcast media and 0 seconds for nonbroadcast media.
holdtime *seconds*	(Optional) Alters the GDP default hold time of 15 seconds. The default is 15 seconds.

ip irdp [**multicast** | **holdtime** *seconds* | **maxadvertinterval** *seconds* | **minadvertinterval** *seconds* | **preference** *number* | **address** *addres*s [*number*]]
no ip irdp

Use the **ip irdp** interface configuration command to enable ICMP Router Discovery Protocol (IRDP) processing on an interface. The **no** form of this command disables IRDP routing on the specified interface.

multicast	(Optional) Use the multicast address (224.0.0.1) instead of IP broadcasts.
holdtime *seconds*	(Optional) Length of time in seconds advertisements are held valid. The default is three times the **maxadvertinterval** value. Must be greater than **maxadvertinterval** and cannot be greater than 9000 seconds.
maxadvertinterval *seconds*	(Optional) Maximum interval in seconds between advertisements. The default is 600 seconds.

minadvertinterval *seconds*	(Optional) Minimum interval in seconds between advertisements. The default is 0.75 times the **maxadvertinterval**. If you change the **maxadvertinterval** value, this value defaults to three-quarters of the new value.
preference *number*	(Optional) Router's preference value. The allowed range is -2^{31} to 2^{31}. The default is 0. A higher value increases the router's preference level. You can modify a particular router so that it will be the preferred router to which others home. The default is 0.
address *address* [*number*]	(Optional) IP address (*address*) to proxy-advertise, and optionally, its preference value (*number*).

ip ospf authentication-key *password*
no ip ospf authentication-key

Use the **ip ospf authentication-key** interface configuration command to assign a password to be used by neighboring routers that are using OSPF's simple password authentication. The **no** form of this command removes any previously assigned OSPF password.

password	Any continuous string of characters, up to 8 bytes long, that can be entered from the keyboard.

ip ospf cost *cost*
no ip cost

Use the **ip ospf cost** interface configuration command to explicitly specify the cost of sending a packet on an interface. The **no** form of this command resets the path cost for an interface to the default value. For

default path costs of various media, see the "Usage Guidelines" section for this command in the *Router Products Command Reference* publication.

> *cost*   Value expressed as the link state metric

ip ospf dead-interval *seconds*
no ip ospf dead-interval

Use the **ip ospf dead-interval** interface configuration command to set the number of seconds that a router's hello packets must not have been seen before its neighbors declare the router down. The **no** form of this command resets the length of time to the default value.

> *seconds*   Unsigned integer that specifies the interval in seconds; the value must be the same for all nodes on the network. The default is four times the interval set for the **ip ospf hello-interval** command.

ip ospf hello-interval *seconds*
no ip ospf hello-interval

Use the **ip ospf hello-interval** interface configuration command to specify the interval between hello packets that the router sends on the interface. The **no** form of this command resets the interval to the default value.

> *seconds*   Unsigned integer that specifies the interval in seconds. The value must be the same for all nodes on a specific network. The default is 10 seconds.

[**no**] **ip ospf-name-lookup**

Use the ip ospf-name-lookup global configuration command to configure OSPF to look up Domain Name System (DNS) names for use in all OSPF **show** EXEC command displays. The **no** form of this command disables the feature.

ip ospf network {**broadcast** | **non-broadcast**}
no ip ospf network

Use the **ip ospf network** interface configuration command to configure the OSPF network type to a type other than the default for a given media. The **no** form of this command restores the default, which varies with the network type.

broadcast	Sets the network type to broadcast.
non-broadcast	Sets the network type to nonbroadcast.

ip ospf priority *number*
no ip ospf priority

Use the **ip ospf priority** interface configuration command to set the router's priority, which helps determine the designated router for this network. The **no** form of this command resets the router priority to the default value.

number	8-bit unsigned integer that specifies the priority. The range is from 0 to 255. The default is 1.

ip ospf retransmit-interval *seconds*
no ip ospf retransmit-interval

To specify the number of seconds between link state advertisement retransmissions for adjacencies belonging to the interface, use the **ip ospf retransmit-interval** interface configuration command. The **no** form of this command resets the link state advertisement retransmission interval to the default value.

seconds	Number of seconds between retransmissions; it must be greater than the expected round-trip delay between any two routers on the attached network. The range is 1 to 65535 seconds. The default is 5 seconds.

ip ospf transmit-delay *seconds*
no ip ospf transmit-delay

Use the **ip ospf transmit-delay** interface configuration command to set the estimated number of seconds it takes to transmit a link state update packet on the interface. The **no** form of this command resets the estimated transmission time to the default value.

seconds	Integer that specifies the number of seconds it takes to transmit a link state update. The range is 1 to 65535 seconds. The default is 1.

ip route *network* [*mask*] {*address* | *interface*} [*distance*]
no ip route

Use the **ip route** global configuration command to establish static routes. The **no** form of this command removes the static routes.

network	IP address of the target network or subnet
mask	(Optional) Network mask that lets you mask network and subnetwork bits
address	IP address of the next hop that can be used to reach that network
interface	Network interface to use
distance	(Optional) An administrative distance

[**no**] **ip router isis** [*tag*]

Use the **ip router isis** interface configuration command to configure an IS-IS routing process for IP over a specified interface. The **no** form of this command disables IS-IS for IP on the interface.

tag	(Optional) Defines a meaningful name for a routing process. If not specified, a null tag is assumed. It must be unique among all IP router processes for a given router. Use the same text for the argument *tag* as specified in the **router isis** global configuration command.

[no] ip split-horizon

Use the **ip split-horizon** interface configuration command to enable the split-horizon mechanism. The **no** form of this command turns off the split-horizon mechanism. Default varies with media.

[no] is-type {**level-1** | **level-1-2** | **level-2-only**}

Use the **is-type** router configuration command to configure the IS-IS level at which the router will operate. The **no** form of this command resets the parameter to the default.

level-1	Router acts as a station router.
level-1-2	Router acts as both a station router and an area router. This is the default.
level-2-only	Router acts as an area router only.

isis circuit-type {**level-1** | **level-1-2** | **level-2**-**only**}
no isis circuit-type

Use the **isis circuit-type** interface configuration command to configure the type of adjacency desired for the specified interface. The **no** form of this command resets the circuit type to Level l and Level 2.

level-1	A Level 1 adjacency may be established if there is at least one area address in common between this system and its neighbors.
level-1-2	A Level 1 and 2 adjacency is established if the neighbor is also configured as **level-1-2** and there is at least one area in common. If there is no area in common, a Level 2 adjacency is established. This is the default.
level-2-only	A Level 2 adjacency is established if and only if the neighbor is configured exclusively to be a Level 2 router.

[no] isis csnp-interval *seconds* {**level-1** | **level-2**}

Use the **isis csnp-interval** interface configuration command to configure the IS-IS complete sequence number PDUs (CSNP) interval for the specified interface. The **no** form of this command restores the default value.

seconds	Time between transmission of CSNPs on multiaccess networks. This interval only applies for the designated router. The default is 10 seconds.
level-1	Configures the time between transmission of CSNPs for Level 1 independently.
level-2	Configures the time between transmission of CSNPs for Level 2 independently.

isis hello-interval *seconds* {**level-1** | **level-2**}
no isis hello-interval {**level-1** | **level-2**}

Use the **isis hello-interval** interface configuration command to specify the length of time, in seconds, between hello packets that the router sends on the specified interface. The **no** form of this command restores the default value.

seconds	Unsigned integer value. A value three times the hello interval *seconds* is advertised as the *holdtime* in the hello packets transmitted. It must be the same for all routers attached to a common network. With smaller hello intervals, topological changes are detected faster, but there is more routing traffic. The default is 10 seconds.
level-1	Configures the hello interval for Level 1 independently. Use this on X.25, SMDS, and Frame Relay multiaccess networks.
level-2	Configures the hello interval for Level 2 independently. Use this on X.25, SMDS, and Frame Relay multiaccess networks.

isis metric *default-metric* [*delay-metric* [*expense-metric* [*error-metric*]]]
  {**level-1** | **level-2**}
no isis metric {**level-1** | **level-2**}

Use the **isis metric** interface configuration command to configure the
metric (or cost) for the specified interface. The **no** form of this command
restores the default metric value.

default-metric	Metric used for the redistributed route. The default metric is used as a value for the IS-IS metric. This is the value assigned when there is no QOS routing performed. Only this metric is supported by Cisco routers. You can configure this metric for Level 1 and/or Level 2 routing. The range is from 0 to 63. The default value is 10.
delay-metric	Not supported.
expense-metric	Not supported.
error-metric	Not supported.
level-1	Router acts as a station router (Level 1) only.
level-2	Router acts as an area router (Level 2) only.

isis password *password* {**level-1** | **level-2**}
no isis password {**level-1** | **level-2**}

Use the **isis password** interface configuration command to configure the
authentication password for a specified interface. The **no** form of this
command disables authentication for IS-IS.

password	Authentication password you assign for an interface.
level-1	Configures the authentication password for Level 1 independently. For Level 1 routing, the router acts as a station router only.
level-2	Configures the authentication password for Level 2 independently. For Level 2 routing, the router acts as an area router only.

isis priority *value* {**level-1** | **level-2**}
no isis priority {**level-1** | **level-2**}

Use the **isis priority** interface configuration command to configure the priority of designated routers. The **no** form of this command resets priority to 64.

value	Priority of a router and is a number from 0 to 127. The default value is 64.
level-1	Sets the priority of a router for Level 1 independently.
level-2	Sets the priority of a router for Level 2 independently.

[**no**] **isis retransmit-interval** *seconds*

Use the **isis retransmit-interval** interface configuration command to configure the number of seconds between retransmission of IS-IS link-state PDU (LSP) retransmission for point-to-point links. The **no** form of this command restores the default value.

seconds	Integer that should be greater than the expected round-trip delay between any two routers on the attached network. The setting of this parameter should be conservative, or needless retransmission will result. The value should be larger for serial lines and virtual links. The default value is 5 seconds.

[**no**] **match as-path** [*path-list-number*]

Use the **match as-path** route-map configuration command to match a BGP autonomous system path access list. Use the **no** form of this command to remove the path list entry.

path-list-number	(Optional) Autonomous system path access list. Integer from 1 through 199.

[**no**] **match interface** *name unit...name unit*

Use the **match interface** route-map configuration command to distribute any routes that have their next hop out one of the interfaces specified. Use the **no** form of this command to remove the **match interface** entry.

    name unit   Names of interfaces, such as Ethernet 0 or Serial 2

[**no**] **match ip address** *access-list-number...access-list-number*

Use the **match ip address** route-map configuration command to distribute any routes that have an address specified by a standard access list. Use the **no** form of this command to remove the **match ip address** entry.

    access-list-number   One or more numeric identifiers of access lists. An integer from 1 through 99.

[**no**] **match ip next-hop** *access-list-number...access-list-number*

Use the **match ip next-hop** route-map configuration command to redistribute any routes that have a next-hop router address passed by one of the access lists specified. Use the **no** form of this command to remove the next-hop entry.

    access-list-number   One or more numeric identifiers of standard access lists. An integer from 1 through 99.

[**no**] **match ip route-source** *access-list-number...access-list-number*

Use the **match ip route-source** route-map configuration command for any routes that have been advertised by routers at the address specified by the access lists. Use the **no** form of this command to remove the route-source entry.

    access-list-number   One or more numeric identifiers of access lists. An integer from 1 through 99.

[**no**] **match metric** *metric-value*

Use the **match metric** route-map configuration command for any routes with the metric specified. Use the **no** form of this command to remove the entry. By default, no metric value matches are defined.

> *metric-value*   Route metric. This may be an IGRP five-part metric. A metric value from 0 through 4294967295.

[**no**] **match route-type** {**internal** | **external** | **level-1** | **level-2**}

Use the **match route-type** route-map configuration command for any routes that are of the specified type. Use the **no** form of this command to remove the route-type entry.

> **internal**   OSPF intra-area and interarea routes or Enhanced IGRP internal routes
>
> **external**   OSPF external type-1 or type-2 routes, or Enhanced IGRP external routes
>
> **level-1**   IS-IS Level 1 routes
>
> **level-2**   IS-IS Level 2 routes

[**no**] **match tag** *tag-value...tag-value*

Use the **match tag** command for any routes stored in the routing table with one of the tags specified. Use the **no** form of this command to remove the tag entry. By default, no match tag values are defined.

> *tag-value*   List of one or more route tags. An integer from 0 through 4294967295.

[**no**] **metric holddown**

Use the **metric holddown** router configuration command to enable metric holddown (IGRP and RIP). Use the **no** form of this command to disable metric holddown.

[no] metric maximum-hops *hops*

Use the **metric maximum-hops** router configuration command to cause the IP routing software to advertise as unreachable those routes with a hop count higher than is specified by the command (IGRP only). Use the **no** form of this command to reset the value to the default.

> *hops*   Maximum hop count (in decimal). The default value is 100 hops; the maximum number of hops that can be specified is 255. The default is 100.

metric weights *tos k1 k2 k3 k4 k5*
no metric weights

Use the **metric weights** router configuration command to allow the tuning of the IGRP metric calculations. Use the **no** form of this command to reset the values to their defaults.

> *tos*   Type of Service. Currently it must always be zero.
>
> *k1–k5*   Constants that convert an IGRP metric vector into a scalar quantity. The default version of IGRP is $k1 = 0$; $k2 = 0$; $k3 = 1$; $k4 = 0$; $k5 = 0$.

[no] neighbor *ip-address*

Use this form of the **neighbor** router configuration command to define a neighboring router with which to exchange EGP, IGRP, or RIP routing information. Use the **no** form of this command to remove an entry. By default, no neighboring routers are defined.

> *ip-address*   IP address of a peer router with which routing information will be exchanged.

[**no**] **neighbor** *ip-address* [**priority** *number*] [**poll-interval** *seconds*]

Use this form of the **neighbor** router configuration command to configure OSPF routers interconnecting to nonbroadcast networks. Use the **no** form of this command with the appropriate IP address and arguments to remove the configuration.

ip-address	Interface IP address of the neighbor.
priority *number*	(Optional) 8-bit number indicating the router priority value of the nonbroadcast neighbor associated with the IP address specified. The default is 0.
poll-interval *seconds*	(Optional) Unsigned integer value reflecting the poll interval. RFC 1247 recommends that this value should be much larger than the hello interval. The default is 120 seconds.

[**no**] **neighbor** {*address* | *tag*} **advertisement-interval** *seconds*

Use the **neighbor advertisement-interval** router configuration command to set the minimum interval between sending BGP routing updates. Use the **no** form of the command to remove an entry.

address	Neighbor address.
tag	Neighbor tag.
seconds	Time in seconds. Integer from 0 through 600. The default is 30 seconds or external peers and 5 seconds for internal peers.

[**no**] **neighbor any** [*access-list-number*]

Use the **neighbor any** router configuration command to control how neighbor entries are added to the routing table for both EGP and BGP. The **no** form of this command removes the configuration.

    access-list-number   (Optional) Access list number the neighbor *must* be accepted by to be allowed to peer with the EGP or BGP process. If no list is specified, any neighbor will be allowed to peer with the router.

[**no**] **neighbor any third-party** *ip-address* [**internal** | **external**]

Use the **neighbor any third-party** router configuration command to configure an EGP process that determine which neighbors will be treated as the next hop in EGP advertisements. The **no** form of this command removes the configuration.

    ip-address   IP address of the third-party router that is to be the next hop in EGP advertisements.

    internal   (Optional) Indicates that the third-party router should be listed in the internal section of the EGP update.

    external   (Optional) Indicates that the third-party router should be listed in the external section of the EGP update.

[**no**] **neighbor** *template-name* **configure-neighbors**

Use the **neighbor configure-neighbors** router configuration command to instruct the router to treat temporary neighbors that have been accepted by a template as if they had been configured by hand. The **no** form of this command causes any new neighbor accepted by the template to be treated as temporary.

    template-name   User-selectable designation that identifies a particular template (an arbitrary word).

[no] neighbor *ip-address* **distribute-list** *access-list-number* {**in** | **out**}

Use the **neighbor distribute-list** router configuration command to distribute BGP neighbor information as specified in an access list. Use the **no** form of this command to remove an entry.

ip-address	Neighbor's IP address.
access-list-number	Predefined access list number. Only standard access lists can be used with this command.
in	Access list is applied to incoming advertisements to that neighbor.
out	Access list is applied to outgoing advertisements from that neighbor.

neighbor *ip-address* **ebgp-multihop**
no neighbor *ip-address*

Use the **neighbor ebgp-multihop** router configuration command to accept and attempt BGP connections to external peers residing on networks that are not directly connected. Use the **no** form of this command to return to the default of allowing only directly connected neighbors.

ip-address	IP address of the BGP-speaking neighbor

[no] neighbor *ip-address* **filter-list** *access-list-number* {**in** | **out** | **weight** *weight*}

Use the **neighbor filter-list** router configuration command to set up BGP filters, using access lists defined with the **ip as-path access-list** command. Use the **no** form of this command to disable this function.

ip-address	IP address of the neighbor.
access-list-number	Predefined autonomous system path access list number.

in	Access list to incoming routes.
out	Access list to outgoing routes.
weight *weight*	Assigns a relative importance to incoming routes matching autonomous system paths. Acceptable values are 0 to 65535.

neighbor *template-name* **neighbor-list** *access-list-number*
no neighbor *template-name* **neighbor-list**

Use the **neighbor neighbor-list** router configuration command to configure BGP to support anonymous neighbor peers by configuring a neighbor template. Use the **no** form of this command to delete the template, and also cause any temporary neighbors accepted by the template to be shut down and removed.

template-name	User-selectable designation that identifies a particular template (an arbitrary word).
access-list-number	IP access list number in the range 1 through 99.

[**no**] **neighbor** *ip-address* **next-hop-self**

Use the **neighbor next-hop-self** router configuration command to configure the router to disable next-hop processing on BGP updates. Use the **no** form of the command to disable this feature.

ip-address	IP address of the BGP-speaking neighbor.

[**no**] **neighbor** *ip-address* **remote-as** *number*

Use the **neighbor remote-as** router configuration command to add an entry to the BGP neighbor table. Use the **no** form of this command to remove a neighbor.

ip-address	Neighbor's IP address.
number	Autonomous system to which the neighbor belongs.

[**no**] **neighbor** {*address* | *tag*} **route-map** *route-map-name* {**in** | **out**}

Use the **neighbor route-map** router configuration command to apply a route map to incoming or outgoing routes. Use the **no** form of this command to remove the entry.

address	Neighbor's IP address
tag	Neighbor tag
route-map-name	Name of route map
in	Apply to incoming routes
out	Apply to outgoing routes

[**no**] **neighbor** *ip-address* **third-party** *third-party-ip-address*
  [**internal** | **external**]

Use the **neighbor third-party** router configuration command to send updates regarding EGP third-party routers. Use the **no** form of this command to disable these updates.

ip-address	IP address of the EGP peer.
third-party-ip-address	Address of the third-party router on the network shared by the Cisco router and the EGP peer specified by *address*.
internal	(Optional) Indicates that the third-party router should be listed in the internal section of the EGP update. This is the default.
external	(Optional) Indicates that the third-party router should be listed in the external section of the EGP update.

[no] neighbor *ip-address* **update-source** *interface*

Use the **neighbor update-source** router configuration command to configure the router to allow internal BGP sessions to use any operational interface for TCP connections. The **no** form of this command restores the default interface assignment to the closest interface, also called the *best-local-address*.

ip-address	IP address of the BGP-speaking neighbor
interface	Loopback interface

[no] neighbor *ip-address* **version** *value*

Use the **neighbor version** router configuration command to configure the router to accept only a particular version. The **no** form of this command returns the version to the default level of that neighbor.

ip-address	IP address of the BGP-speaking neighbor.
version *value*	Version number. The version can be set to 2 to force the router to only use Version 2 with the specified neighbor. The default is to use Version 4 of BGP and dynamically negotiate down to Version 2 if requested.

[no] neighbor *ip-address* **weight** *weight*

Use the **neighbor weight** router configuration command to specify a weight to assign to a specific neighbor connection. The **no** form of this command removes the assignment.

ip-address	Neighbor's IP address.
weight *weight*	Weight to assign. Acceptable values are 0 to 65535. Routes learned through another BGP peer have a default weight of 0 and routes sourced by the local router have a default weight of 32768.

[**no**] **net** *network-entity-title*

Use the **net** router configuration command to configure a Network Entity Title (NET) for the routing process. The **no** form of this command removes a specific NET; you must specify the NET.

network-entity-title	NET that specifies the area address and the system ID for an IS-IS routing process. This argument can be either an address or a name.

[**no**] **network** *network-number* **mask** *network-mask*

Use this form of the **network** router configuration command to specify the BGP network to be advertised as originating within the current autonomous system. The **no** form of this command removes the specified network.

network-number	IP address of the network
network-mask	Network mask address

[**no**] **network** *network-number*

Use this form of the **network** router configuration command to specify the list of networks for the EGP routing process. The **no** form of this command removes a network from the list.

network-number	IP address of a peer router with which routing information will be exchanged

[**no**] **network** *network-number*

Use this form of the **network** router configuration command to specify a list of networks for the IGRP routing process. The **no** form of this command removes a network from the list.

network-number	IP address of the directly connected network

[**no**] **network** *network-number*

Use this form of the **network** router configuration command to specify a list of networks for the RIP routing process. The **no** form of this command removes a network from the list.

> *network-number*   IP address of the network of directly connected networks

[**no**] **network** *address wildcard-mask* **area** *area-id*

Use the **network area** router configuration command to define the interfaces on which OSPF runs and to define the area ID for those interfaces. The **no** form of this command disables OSPF routing for interfaces defined with the *address wildcard-mask* pair; you must specify the complete address range and area ID.

> *address*   IP address.
>
> *wildcard-mask*   IP-address-type mask that includes "don't care" bits.
>
> *area-id*   Area that is to be associated with the OSPF address range. It can be specified as either a decimal value or as an IP address. If you intend to associate areas with IP subnets, you can specify a subnet address as the *area-id*.

[**no**] **network** *address* **backdoor**

Use the network backdoor router configuration command to specify a backdoor route to a BGP border router that will provide better information about the network. The no form of this command removes an address from the list.

> *address*   IP address of the network to which you want a backdoor route.

[no] network *address* **weight** *weight*

Use the **network weight** command to assigns an absolute weight, or importance, to a BGP network. Use the no form of the command to delete the entry.

address	IP address of the network
weight *weight*	Absolute weight. Integer from 0 to 65535. By default, weight is unmodified and is zero unless it has been modified by other router configuration commands.

[no] offset-list {**in** | **out**} *offset* [*access-list-number*]

Use the **offset-list** router configuration command to add or remove a positive offset to incoming and outgoing metrics for networks matching a specified access list (for IGRP and RIP only). The **no** form of this command with the appropriate keywords removes the offset list.

in	Applies the access list to incoming metrics.
out	Applies the access list to outgoing metrics.
offset	Positive offset to be applied to metrics for networks matching the access list. If the offset is zero, no action is taken.
access-list-number	(Optional) Access list to be applied. If unspecified, the argument supplied to *offset* is applied to all metrics. If *offset* is zero, no action is taken. For IGRP, the offset is added to the delay component only. Must be a standard access list.

[n**o**] **passive-interface** *interface*

Use the **passive-interface** router configuration command to disable sending routing updates on an interface. The **no** form of this command reenables sending routing updates on the specified interface.

>   *interface*   Specified interface. The particular subnet will continue to be advertised to other interfaces. Updates from other routers on that interface continue to be received and processed.

[**no**] **redistribute** *protocol* [*process-id*] {**level-1** | **level-1-2** | **level-2**}
　　[**metric** *metric-value*] [**metric-type** *type-value*]
　　[**match internal** | **external** *type-value* | **external** *type-value*]
　　[**tag** *tag-value*] [**route-map** *map-tag*] [**weight** *weight*] [**subnets**]

Use the **redistribute** router configuration command to redistribute routes from one routing domain into another routing domain. The **no** form of this command ends redistribution of information when you supply the

appropriate arguments, or disables any of the specified keywords.

protocol	The source protocol from which routes are being redistributed. It can be one of the following keywords: **bgp**, **egp**, **igrp**, **isis**, **ospf**, **static** [**ip**], **connected** and **rip**.

The keyword **static** [**ip**] is used to redistribute IP static routes. The optional **ip** keyword is used when redistributing into IS-IS.

The keyword **connected** refers to routes which are established automatically by virtue of having enabled IP on an interface. For routing protocols such as OSPF and IS-IS, these routes will be redistributed as external to the autonomous system. |
process-id	For **bgp**, **egp**, or **igrp**, this is an autonomous system number, a 16-bit decimal number. For **isis**, this is an optional *tag* that defines a meaningful name for a routing process. You can specify only one IS-IS process per router. Creating a name for a routing process means that you use names when configuring routing. For **ospf**, this is an appropriate OSPF process ID from which routes are to be redistributed. This identifies the routing process. This value takes the form of a nonzero decimal number. For **rip**, no *process-id* value is needed.
level-1	For IS-IS, Level 1 routes are redistributed into other IP routing protocols independently.
level-1-2	For IS-IS, both Level 1 and Level 2 routes are redistributed into other IP routing protocols.

level-2	For IS-IS, Level 2 routes are redistributed into other IP routing protocols independently.
metric *metric-value*	(Optional) Metric used for the redistributed route. If a value is not specified for this option, and no value is specified using the **default-metric** router configuration command, the default metric value is 0. Use a value consistent with the destination protocol.
metric-type *type-value*	(Optional) For OSPF, the external link type associated with the default route advertised into the OSPF routing domain. It can be one of two values:
	1—Type 1 external route
	2—Type 2 external route
	If a **metric-type** is not specified, the router adopts a Type 2 external route.
	For IS-IS, it can be one of two values:
	internal—IS-IS metric which is < 63.
	external—IS-IS metric which is > 64 < 128.
	The default is **internal**.
match internal | **external**	(Optional) For OSPF, the criteria by which OSPF routes are redistributed into other routing domains. Can be either:
	internal—Routes that are internal to a specific autonomous system**.**
	external—Routes that are external to the autonomous system, but are to be imported to OSPF as external routes.

external *type-value*	(Optional) External route type to be redistributed into other routing domains:
	1—Type 1 external route
	2—Type 2 external route
	The default is internal.
tag *tag-value*	(Optional) 32-bit decimal value attached to each external route. This is not used by the OSPF protocol itself. It may be used to communicate information between autonomous system boundary routers. If none is specified, then the remote autonomous system number is used for routes from BGP and EGP; for other protocols, zero (0) is used.
route-map	(Optional) Route map should be interrogated to filter the importation of routes from this source routing protocol to the current routing protocol. If not specified, all routes are redistributed. If this keyword is specified, but no route map tags are listed, no routes will be imported.
map-tag	Identifier of a configured route map.
weight *weight*	Network weight when redistributing into BGP. An integer between 0 and 65535.
subnets	(Optional) For redistributing routes into OSPF, the scope of redistribution for the specified protocol.

[**no**] **route-map** *map-tag* [[**permit** | **deny**] | *sequence-number*]

Use the **route-map** global configuration command, and the route-map configuration commands **match** and **set**, to define the conditions for redistributing routes from one routing protocol into another. The **no** form of this command deletes the route map.

map-tag	Defines a meaningful name for the route map. The **redistribute** router configuration command uses this name to reference this route map. Multiple route maps may share the same map tag name.
permit	(Optional) If the match criteria are met for this route map, and **permit** is specified, the route is redistributed as controlled by the set actions. If the match criteria are not met, and **permit** is specified, the next route map with the same map-tag is tested. If a route passes none of the match criteria for the set of route maps sharing the same name, it is not redistributed by that set.
deny	(Optional) If the match criteria are met for the route map, and **deny** is specified, the route is not redistributed, and no further route maps sharing the same map tag name will be examined.
sequence-number	(Optional) Number that indicates the position a new route map is to have in the list of route maps already configured with the same name. If given with the **no** form of this command, it specifies the position of the route map that should be deleted.

[**no**] **router bgp** *autonomous-system*

Use the **router bgp** global configuration command to configure the Border Gateway Protocol (BGP) routing process. Use the **no** form of this command to remove the routing process.

> *autonomous-system*   Touter to other BGP routers and tags the routing information passed along.

[**no**] **router egp** *remote-as*

Use the **router egp** global configuration command to configure the Exterior Gateway Protocol (EGP) routing process. To turn off the EGP routing process, use the **no** form of this command.

> *remote-as*   Autonomous system number the router expects its peers to be advertising in their EGP messages.

[**no**] **router egp 0**

Use the **router egp 0** global configuration command to specify that a router should be considered a core gateway. Use the **no** form of this command to disable this function.

[**no**] **router igrp** *autonomous-system*

Use the **router igrp** global configuration command to configure the Interior Gateway Routing Protocol (IGRP) routing process. Use the **no** form of this command to shut down the routing process on the specified autonomous system.

> *autonomous-system*   Routes to the other IGRP routers. It is used to tag the routing information.

[no] router isis [*tag*]

Use the **router isis** global configuration command to enable the IS-IS routing protocol on your router and to specify an IS-IS process for IP. The **no** form of this command disables IS-IS routing.

> *tag*   (Optional) Meaningful name for a routing process. If it is not specified, a null tag is assumed and the process is referenced with a null tag. This name must be unique among all IP router processes for a given router.

[no] router ospf *process-id*

Use the **router ospf** global configuration command to enable an OSPF routing process on a router. Use the **no** form of this command to terminate an individual OSPF routing process.

> *process-id*   Internally used identification parameter for an OSPF routing process. It is locally assigned and can be any positive integer. A unique value is assigned for each OSPF routing process.

[no] router rip

Use the **router rip** global configuration command to configure the Routing Information Protocol (RIP) routing process. Turn off the RIP routing process using the **no** form of this command.

[no] set automatic-tag

Use the **set automatic-tag** route-map configuration command to automatically compute the tag value. Use the **no set automatic-tag** command to disable this function.

[no] set level {**level-1** | **level-2** | **level-1-2** | **stub-area** | **backbone**}

Use the **set level** route-map configuration command to indicate where to import routes. Use the **no** form of this command to delete the entry. By default, disabled.

level-1	Import into a Level-1 area.
level-2	Import into Level-2 subdomain. For IS-IS destinations, this is the default.
level-1-2	Import into Level-1 and Level-2.
stub-area	Import into OSPF NSSA area.
backbone	Import into OSPF backbone area. For OSPF destinations, this is the default.

[no] set local-preference *value*

Use the **set local-preference** route-map configuration command to specify a preference value for an autonomous system path. Use the **no** form of this command to delete the entry.

value	Preference value. An integer from 0 through 4294967295. The default is 100.

[no] set metric *metric-value*

Use the **set metric** route-map configuration command to set the metric value for destination routing protocol. Use the **no** form of this command to return to the default metric value.

metric-value	Metric value or IGRP bandwidth in kilobits per second. An integer from 0 through 294967295.

[no] set metric-type {**internal** | **external** | **type-1** | **type-2**}

Use the **set metric-type** command to set the metric type for the destination routing protocol.

internal	IS-IS internal metric
external	IS-IS external metric
type-1	OSPF external type 1 metric
type-2	OSPF external type 2 metric

[no] set next-hop *next-hop*

Use the **set next-hop** route-map configuration command to specify the address of the next hop. Use the **no** form of this command to delete the entry.

next-hop	IP address of the next hop router

set origin {**igp** | **egp** *as* | **incomplete**}

Use the **set origin** route-map configuration command to set the BGP origin code. Use the **no** form of this command to delete the entry.

igp	Remote EGP.
egp	Local IGP.
as	Remote autonomous system. An integer from 0 through 65535.
incomplete	Unknown heritage.

[no] set tag *tag-value*

Use the **set tag** route-map configuration command to set a tag value of the destination routing protocol. Use the **no** form of this command to delete the entry.

tag-value	Name for the tag. Integer from 0 through 4294967295.

[**no**] **set weight** *weight*

Use the **set weight** route-map configuration command to specify the BGP weight for the routing table. Use the **no** form of this command to delete the entry.

> *weight*   Weight value. From 0 through 65535.

show ip bgp [*network*] [*network-mask*] [**subnets**]

Use the **show ip bgp** EXEC command to display a particular network in the BGP routing table.

> *network*   (Optional) Network number, entered to display a particular network in the BGP routing table.
>
> *network-mask*   (Optional) Displays all BGP routes matching the address/mask pair.
>
> **subnets**   (Optional) Displays route and more specific routes.

show ip bgp cidr-only

Use the **show ip bgp cidr-only** privileged EXEC command to display only routes with non-natural network masks.

show ip bgp filter-list *access-list-number*

Use the **show ip bgp filter-list** privileged EXEC command to display routes that conform to a specified filter list.

> *access-list-number*   Regular expression access list number from 1 through 199.

show ip bgp neighbors [*address* [**routes** | **paths**]]

Use the **show ip bgp neighbors** EXEC command to display detailed information on the TCP and BGP connections to individual neighbors. Use the optional form **show ip bgp neighbors** *address* **routes** to show the routes learned from a particular neighbor.

address	(Optional) Address of the neighbor whose routes you have learned from.
routes	(Optional) Routes of specified neighbors.
paths	(Optional) Autonomous system path of specified neighbor.

show ip bgp paths

Use the **show ip bgp paths** EXEC command to display all the BGP paths in the database.

show ip bgp regexp *regular-expression*

Use the **show ip bgp regexp** privileged EXEC command to display routes matching the regular expression.

regular-expression	Regular-expression to match the BGP autonomous system paths.

show ip bgp summary

Use the **show ip bgp summary** EXEC command to display the status of all BGP connections.

show ip egp

Use the **show ip egp** EXEC command to display statistics on EGP connections and neighbors.

show ip irdp

Use the **show ip irdp** EXEC command to display IRDP values.

show ip ospf [*process-id*]

Use the **show ip ospf** EXEC command to display general information about OSPF routing processes in a particular router.

    process-id   (Optional) Process ID. If this argument is included, only information for the specified routing process is included.

show ip ospf border-routers

Use the **show ip ospf border-routers** privileged EXEC command to display the internal OSPF routing table entries to Area Border Router (ABR) and Autonomous System Boundary Router (ASBR).

show ip ospf [*process-id area-id*] **database**
show ip ospf [*process-id area-id*] **database** [**router**] [*link-state-id*]
show ip ospf [*process-id area-id*] **database** [**network**] [*link-state-id*]
show ip ospf [*process-id area-id*] **database** [**summary**] [l*ink-state-id*]

show ip ospf [*process-id area-id*] **database** [**asb-summary**]
   [*link-state-id*]
show ip ospf [*process-id*] **database** [**external**] [l*ink-state-id*]

Use the **show ip ospf database** EXEC command to display lists of information related to the OSPF database for a specific router. The various forms of this command deliver information about different OSPF link state advertisements.

process-id	(Optional) Internally used identification parameter. It is locally assigned and can be any positive integer number. The number used here is the number assigned administratively when enabling the OSPF routing process.
area-id	(Optional) Area number associated with the OSPF address range defined in the **network** router configuration command used to define the particular area.
link-state-id	(Optional) Portion of the Internet environment that is being described by the advertisement. The value depends on the advertisement's LS type. It must be entered in the form of an IP address.
	When the link state advertisement is describing a network, the *link-state-id* can take one of two forms:
	—The network's IP address (as in type 3 summary link advertisements and in AS external link advertisements).
	—A derived address obtained from the link state ID. (Note that masking a network links advertisement's link state ID with the network's subnet mask yields the network's IP address.)
	When the link state advertisement is describing a router, the link state ID is always the described router's OSPF router ID.
	When an AS external advertisement (LS Type = 5) is describing a default route, its link state ID is set to Default Destination (0.0.0.0).

show ip ospf interface [*interface-name*]

Use the **show ip ospf interface** EXEC command to display OSPF-related interface information.

   interface-name   (Optional) Interface type and number.

show ip ospf neighbor [*interface-name*] [*neighbor-id*] **detail**

Use the **show ip ospf neighbor** EXEC command to display OSPF-neighbor information on a per-interface basis.

interface-name	(Optional) Interface type and number.
neighbor-id	(Optional) Neighbor ID.
detail	Display all neighbors given in detail (list all neighbors).

show ip ospf virtual-links

Use the **show ip ospf virtual-links** EXEC command to display the parameters and current state of OSPF virtual links.

show ip protocols

Use the **show ip protocols** EXEC command to display the parameters and current state of the active routing protocol process.

show ip route [*address* [*mask*]] | [*protocol*]

Use the **show ip route** EXEC command to display the current state of the routing table.

address	(Optional) Address about which routing information should be displayed.
mask	(Optional) Argument for a subnet mask.
protocol	(Optional) Name of a routing protocol; or the keyword **connected**, **static**, or **summary**. If you specify a routing protocol, use one of the following keywords: **bgp**, **egp**, **eigrp**, **hello**, **igrp**, **isis**, **ospf**, or **rip**.

show ip route summary

Use the **show ip route summary** EXEC command to display the current state of the routing table.

show ip route supernets-only

Use the **show ip route supernets-only** privileged EXEC command to display information about supernets.

show isis database [**level-1**] [**level-2**] [**l1**] [**l2**] [**detail**] [**lspid**]]

The **show isis database** EXEC command displays the IS-IS link state database.

level-1	(Optional) Displays the IS-IS link state database for Level 1.
level-2	(Optional) Displays the IS-IS link state database for Level 2.
l1	(Optional) Abbreviation for the option **level-1**.

l2	(Optional) Abbreviation for the option **level-2**.
detail	(Optional) When specified, the contents of each LSP is displayed. Otherwise, a summary display is provided.
lspid	(Optional) Link-state protocol ID. When specified, the contents of a single LSP is displayed by its ID number.

show route-map [*map-name*]

Use the **show route-map** EXEC command to display all route-maps configured or only the one specified.

map-name	(Optional) Name of a specific route-map

[**no**] **summary-address** *address mask* {**level-1** | **level-1-2** | **level-2**}

Use the **summary-address** router configuration command to create aggregate IS-IS addresses. The **no summary-address** command restores the default.

address	Summary address designated for a range of addresses.
mask	IP subnet mask used for the summary route.
level-1	If **level-1** is specified, only routes redistributed into Level 1 are summarized with the configured address/mask value.
level-1-2	If specified, the summary router is injected into both a Level 1 area and a Level 2 subdomain.
level-2	If **level-2** is specified, routes learned by Level 1 routing will be summarized into the Level 2 backbone with the configured address/mask value.

[no] synchronization

Use the **synchronization** router configuration command to disable the synchronization between BGP and your IGP. The **no** form of this command enables a router to advertise a network route without waiting for the IGP.

[no] table-map *route-map-name*

Use the **table-map** router configuration command to modify metric and tag values when the IP routing table is updated with BGP learned routes. Use the **no** form of the command to disable this function.

> *route-map-name*   Route map name, from **route-map** command.

timers basic *update invalid holddown flush* [*sleeptime*]
no timers basic

Use the **timers basic** router configuration command to adjust EGP, RIP, or IGRP network timers. The **no** form of this command restores the defaults.

update	Rate(in seconds at which updates are sent. This is the fundamental timing parameter of the routing protocol.
invalid	Interval of time in seconds after which a route is declared invalid; it should be three times the value of *update*. A route becomes invalid when there is an absence of updates that refresh the route. The route then enters holddown. The route is marked inaccessible and advertised as unreachable. However, the route is still used for forwarding packets.

holddown	Interval in seconds during which routing information regarding better paths is suppressed. It should be at least three times the value of *update*. A route enters into a holddown state when an update packet is received that indicates the route is unreachable. The route is marked inaccessible and advertised as unreachable. However, the route is still used for forwarding packets. When holddown expires, routes advertised by other sources are accepted and the route is no longer inaccessible.
flush	Time in seconds that must pass before the route is removed from the routing table; the interval specified must be at least the sum of *invalid* and *holddown*. If it is less than this sum, the proper holddown interval cannot elapse, which results in a new route being accepted before the holddown interval expires.
sleeptime	(Optional) For IGRP only, interval in milliseconds for postponing routing updates in the event of a flash update. The *sleeptime* value should be less than the *update* time. If the *sleeptime* is greater than the *update* time, routing tables will become unsynchronized.

timers bgp *keepalive holdtime*
no timers bgp

Use the **timers bgp** router configuration command to adjust BGP network timers. The **no** form of this command resets the BGP timing defaults.

keepalive	Frequency, in seconds, with which the router sends *keepalive* messages to its peer. The default is 60 seconds.
holdtime	Interval, in seconds, after not receiving a *keepalive* message that the router declares a peer dead. The default is 180 seconds.

timers egp *hello polltime*
no timers egp

Use the timers egp router configuration command to adjust EGP hello and polltime network timers. The **no** form of this command resets the EGP timing defaults.

hello	Frequency, in seconds, with which the router sends hello messages to its peer. The default is 60 seconds.
polltime	Interval, in seconds, for how frequently to exchange updates. The default is 180 seconds.

[no] traffic share {**balanced** | **min**}

Use the **traffic-share** command to control how traffic is distributed among routes when there are multiple routes that have different costs. Use the **no** form of this command to disable this function.

balanced	Distribute traffic proportionately to the ratios of the metrics.
min	Routes that have minimum costs will be used.

[no] validate-update-source

Use the **validate-update-source** router configuration command to cause the router to validate the source IP address of incoming routing updates for RIP and IGRP routing protocols. Use the **no** form of this command to disable this function for RIP or IGRP.

variance *multiplier*
no variance

Use the **variance** router configuration command to control load balancing in an IGRP-based internet. The **no** form of this command resets variance to the default value.

multiplier	Range of metric values that will be accepted for load balancing. Acceptable values are nonzero, positive integers. The default is 1, or equal-cost load balancing.