Cisco IOS ISO Connectionless Network Service Commands

The International Organization for Standardization (ISO) Connectionless Network Service (CLNS) protocol is a standard for the network layer of the OSI model.

Use the commands in this book to configure and monitor ISO CLNS networks. For ISO CLNS protocol configuration information and examples, see the *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide,* Release 12.2.

clear clns cache

To clear and reinitialize the CLNS routing cache, use the **clear clns cache** command in EXEC mode.

clear clns cache

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example clears the CLNS routing cache:

```
clear clns cache
```

Related Commands

Command	Description
show clns cache	Displays the CLNS routing cache.

clear clns es-neighbors

To remove end system (ES) neighbor information from the adjacency database, use the **clear clns es-neighbors** command in EXEC mode.

> **clear clns** [*tag*] **es-neighbors**

Syntax Description

tag	(Optional) Meaningful name for a routing process. For example, you could define a routing process named *Finance* for the Finance department, and another routing process named *Marketing* for the Marketing department. If not specified, a null tag is assumed. The *tag* argument must be unique among all CLNS router processes for a given router.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.0(5)T	The *tag* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When you enter the **clear clns es-neighbors** command to clear dynamically discovered neighbors that are learned through ES-IS or IS-IS protocols, keep in mind that these adjacencies may have reappeared by the time you enter the **show clns neighbors** command. These dynamic adjacencies can be quickly reformed if the neighbors exchange hello messages.

Examples

The following example removes the ES neighbor information from the adjacency database:

```
clear clns es-neighbors
```

Related Commands

Command	Description
clear clns is-neighbors	Removes the IS neighbors that this router knows.
clear clns neighbors	Removes CLNS neighbor information from the adjacency database.
show clns es-neighbors	Lists the ES neighbors that this router knows.

clear clns is-neighbors

To remove intermediate system (IS) neighbor information from the adjacency database, use the **clear clns is-neighbors** command in EXEC mode.

clear clns [*tag*] **is-neighbors**

Syntax Description

tag	(Optional) Meaningful name for a routing process. For example, you could define a routing process named *Finance* for the Finance department, and another routing process named *Marketing* for the Marketing department. If not specified, a null tag is assumed. The *tag* argument must be unique among all CLNS router processes for a given router.

Command Modes   EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.0(5)T	The *tag* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   When you enter the **clear clns is-neighbors** command to clear dynamically discovered neighbors that are learned through ES-IS or IS-IS protocols, keep in mind that these adjacencies may have reappeared by the time you enter the **show clns neighbors** command. These dynamic adjacencies can be quickly reformed if the neighbors exchange hello messages.

Examples   The following example removes the IS neighbor information from the adjacency database:

```
clear clns is-neighbors
```

Related Commands

Command	Description
clear clns es-neighbors	Removes ES neighbor information from the adjacency database.
clear clns neighbors	Removes CLNS neighbor information from the adjacency database.
show clns is-neighbors	Displays IS-IS related information for IS-IS router adjacencies.

clear clns neighbors

To remove CLNS neighbor information from the adjacency database, use the **clear clns neighbors** command in EXEC mode.

clear clns [*tag*] **neighbors**

Syntax Description

tag	(Optional) Meaningful name for a routing process. For example, you could define a routing process named *Finance* for the Finance department, and another routing process named *Marketing* for the Marketing department. If not specified, a null tag is assumed. The *tag* argument must be unique among all CLNS router processes for a given router.

Command Modes   EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.0(5)T	The *tag* argument was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   When you enter the **clear clns neighbors** command to clear dynamically discovered neighbors that are learned through ES-IS or IS-IS protocols, keep in mind that these adjacencies may have reappeared by the time you enter the **show clns neighbors** command. These dynamic adjacencies can be quickly reformed if the neighbors exchange hello messages.

Examples   The following example removes the CLNS neighbor information from the adjacency database:

```
clear clns neighbors
```

Related Commands

Command	Description
clear clns es-neighbors	Removes ES neighbor information from the adjacency database.
clear clns is-neighbors	Removes IS neighbor information from the adjacency database.
show clns neighbors	Displays both ES and IS neighbors.

clear clns route

To remove all of the dynamically derived CLNS routing information, use the **clear clns route** command in EXEC mode.

clear clns route

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example removes all of the dynamically derived CLNS routing information:

```
clear clns route
```

Related Commands

Command	Description
show clns route	Displays all of the destinations to which this router knows how to route packets.

clear clns traffic

To clear all ISO CLNS statistics that are displayed when you use the **show clns traffic** command, use the **clear clns traffic** command in EXEC mode.

clear clns [*tag*] **traffic**

Syntax Description	

tag	(Optional) Meaningful name for a routing process. For example, you could define a routing process named *Finance* for the Finance department, and another routing process named *Marketing* for the Marketing department. If not specified, a null tag is assumed. The *tag* argument must be unique among all CLNS router processes for a given router.

Command Modes   EXEC

Command History

Release	Modification
12.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example removes the ISO CLNS statistics:

```
clear clns traffic
```

Related Commands

Command	Description
show clns traffic	Lists the CLNS packets that this router has seen.

clear tarp counters

To clear all Target Identifier Address Resolution Protocol (TARP) counters that are shown with the **show tarp traffic** command, use the **clear tarp counters** command in EXEC mode.

      clear tarp counters

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Clearing the counters can assist you with troubleshooting. For example, you may want to clear the counter and then check to see how many PDUs the router is originating.

Examples   The following example clears the TARP counters:

```
clear tarp counters
```

Related Commands

Command	Description
show tarp traffic	Displays statistics about TARP PDUs since the last time the counters were cleared.

clear tarp ldb-table

To clear the system ID-to-sequence number mapping entries stored in the TARP loop-detection buffer table, use the **clear tarp ldb-table** command in EXEC mode.

clear tarp ldb-table

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The loop-detection buffer table prevents TARP packets from looping.

Clearing the mapping entries assists you with troubleshooting. For example, clear the loop-detection buffer table and assign a new sequence number (using the **tarp sequence-number** command) to ensure that other hosts update their entries.

Examples   The following example clears the TARP loop-detection buffer table:

```
clear tarp ldb-table
```

Related Commands

Command	Description
show tarp ldb	Displays the contents of the loop-detection buffer table.
tarp ldb-timer	Specifies the length of time that a system ID-to-sequence number mapping entry remains in the loop-detection buffer table.

clear tarp tid-table

To clear the dynamically created TARP target identifier (TID)-to-NSAP address mapping entries stored in TID cache, use the **clear tarp tid-table** command in EXEC mode.

clear tarp tid-table

Syntax Description   This command has no arguments or keywords.

Command Modes   EXEC

Command History

Release	Modification
11.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Clearing the TID cache is one method to remove old entries. Another method is to set the length of time a dynamically created TARP entry remains in the TID cache using the **tarp cache-timer** command.

The **clear tarp tid-table** command does not delete the cache entry for its own TID or the cache entries explicitly configured with the **tarp map** command.

Examples   The following example clears the TARP TID table:

```
clear tarp tid-table
```

Related Commands

Command	Description
show tarp map	Lists all static entries in the TID cache that were configured with the tarp map command.
show tarp tid-cache	Displays information about the entries in the TID cache.
tarp allow-caching	Reenables the storage of TID-to-NSAP address mapping in the TID cache.
tarp cache-timer	Specifies the length of time that a dynamically created TARP entry remains in the TID cache.
tarp map	Enters a TID-to-NSAP static map entry in the TID cache.

clns access-group

To filter transit CLNS traffic going either into or out of the router or both on a per-interface basis, use the **clns access-group** command in interface configuration mode. To disable filtering of transit CLNS packets, use the **no** form of this command.

> **clns access-group** *name* [**in** | **out**]

> **no clns access-group** *name* [**in** | **out**]

Syntax Description

name	Name of the filter set or expression to apply.
in	(Optional) Filter should be applied to CLNS packets entering the router.
out	(Optional) Filter should be applied to CLNS packets leaving the router. If you do not specify an **in** or **out** keyword, **out** is assumed.

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   This command has no effect on any CLNS packets sourced by Cisco IOS software. It applies only to packets forwarded by the software. Fast switching is still supported with access groups in place, but its performance will be impacted based on the complexity of the filters.

For descriptions of filter sets and expressions, refer to the **clns filter-expr**, **clns filter-set**, and **clns template-alias** global configuration commands.

Examples   The following example enables forwarding of frames received on Ethernet 0 that had a source address of anything other than 38.840F, and a destination address that started with 47.0005 or 47.0023, but nothing else:

```
clns filter-set US-OR-NORDUNET permit 47.0005...
clns filter-set US-OR-NORDUNET permit 47.0023...
clns filter-set NO-ANSI deny 38.840F...
clns filter-set NO-ANSI permit default
clns filter-expr STRANGE source NO-ANSI and destination US-OR-NORDUNET
interface ethernet 0
 clns access-group STRANGE in
```

Related Commands	Command	Description
	clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
	clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
	clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.

clns adjacency-filter

To filter the establishment of ES-IS adjacencies, use the **clns adjacency-filter** command in interface configuration mode. To disable this filtering, use the **no** form of this command.

> **clns adjacency-filter** {**es** | **is**} *name*

> **no clns adjacency-filter** {**es** | **is**} *name*

Syntax Description		
es	ES adjacencies are to be filtered.	
is	IS adjacencies are to be filtered.	
name	Name of the filter set or expression to apply.	

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Filtering is performed on full NSAP addresses. If filtering should only be performed on system IDs or any other substring of the full NSAP address, the wildcard-matching capabilities of filter sets should be used to ignore the insignificant portions of the NSAP addresses.

Note   When you enter the **clns adjacency-filter** command, only the adjacencies that were formed using ES-IS will be filtered out. In order to remove adjacencies that were formed using IS-IS and ISO-IGRP, use the **isis adjacency-filter** and **iso-igrp adjacency-filter** commands, respectively.

For descriptions of filter sets and expressions, refer to the **clns filter-expr**, **clns filter-set**, and **clns template-alias** global configuration commands.

Examples   The following example builds a filter that accepts end system adjacencies with only two systems, based only on their system IDs:

```
clns filter-set ourfriends ...0000.0c00.1234.**
clns filter-set ourfriends ...0000.0c00.125a.**
interface ethernet 0
 clns adjacency-filter es ourfriends
```

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Related Commands	Command	Description
	clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
	clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
	clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.
	isis adjacency-filter	Filters the establishment of IS-IS adjacencies.
	iso-igrp adjacency-filter	Filters the establishment of ISO IGRP adjacencies.

clns cache-invalidate-delay

To control the invalidation rate of the CLNS route cache, use the **clns cache-invalidate-delay** command in global configuration mode. To allow the CLNS route cache to be immediately invalidated, use the **no** form of this command.

clns cache-invalidate-delay [*minimum maximum quiet threshold*]

no clns cache-invalidate-delay

Syntax Description

minimum	(Optional) Minimum time (in seconds) between invalidation request and actual invalidation. The default is 2 seconds.
maximum	(Optional) Maximum time (in seconds) between invalidation request and actual invalidation. The default is 5 seconds.
quiet	(Optional) Length of time (in seconds) before invalidation.
threshold	(Optional) Maximum number of invalidations considered to be quiet.

Defaults

minimum: 2 seconds

maximum: 5 seconds

quiet: 3 seconds

threshold: 0 invalidations

Command Modes

Global configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

All cache invalidation requests are honored immediately.

This command should typically not be used except under the guidance of technical support personnel. Incorrect settings can seriously degrade network performance.

In an environment with heavy traffic, the CLNS cache can get invalidated (purged) too frequently. Frequent cache invalidations will cause the CPU to spend too much time purging and repopulating the cache.

The **clns cache-invalidate-delay** command controls how the CLNS route cache is purged. The intent is to delay invalidation of the cache until after routing has settled down. Because the routing table changes tend to be clustered in a short period of time, and the cache may be purged repeatedly, a high CPU load might be placed on the router.

When this feature is enabled, and the system requests that the route cache be purged, the request is held for at least the *minimum* seconds. Then the system determines whether the cache has been "quiet" (that is, less than *threshold* invalidation requests in the last *quiet* seconds). If the cache has been quiet, the cache is then purged. If the cache does not become quiet within *maximum* seconds after the first request, it is purged unconditionally.

Manipulation of these parameters trades off CPU utilization versus route convergence time. The timing of routing protocols is not affected, but the removal of stale cache entries is affected.

Examples   The following example sets a minimum delay of 5 seconds, a maximum delay of 30 seconds, and a quiet threshold of no more than 5 invalidation requests in the previous 10 seconds:

```
clns cache-invalidate-delay 5 30 10 5
```

Related Commands

Command	Description
clns route-cache	Allows fast switching through the cache.
show clns cache	Displays the CLNS route cache.

clns checksum

To enable checksum generation when ISO CLNS routing software sources a CLNS packet, use the **clns checksum** command in interface configuration mode. To disable checksum generation, use the **no** form of this command.

> **clns checksum**

> **no clns checksum**

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   This command has no effect on routing packets, such as ES-IS, ISO-Interior Gateway Routing Protocol (IGRP) and IS-IS, sourced by the system. It applies to pings and trace route packets.

Examples   The following example enables checksum generation:

```
interface ethernet 0
 clns checksum
```

clns cluster-alias

To allow multiple end systems to advertise the same NSAP address but with different system IDs in ES hello messages, use the **clns cluster-alias** command in interface configuration mode. To disable cluster aliasing, use the **no** form of this command.

> **clns cluster-alias**

> **no clns cluster-alias**

Syntax Description   This command has no arguments or keywords.

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   This feature caches multiple ES adjacencies with the same NSAP, but with different subnetwork point of attachment (SNPA) addresses. When a packet is destined to the common NSAP address, Cisco IOS software load-splits the packets among the different SNPA addresses. A router that supports this capability forwards traffic to each system.

If DECnet Phase V cluster aliases are disabled on an interface, ES hello packet information is used to replace any existing adjacency information for the NSAP. Otherwise, an additional adjacency (with a different SNPA) is created for the same NSAP.

Examples   The following example enables cluster aliasing on specified interfaces:

```
clns nsap 47.0004.004d.0001.0000.0c00.1111.00
clns routing

interface ethernet 0
 clns cluster-alias

interface ethernet 1
 clns cluster-alias
```

clns configuration-time

To specify the rate at which ES hellos and IS hellos are sent, use the **clns configuration-time** command in global configuration mode. To restore the default value, use the **no** form of this command.

> **clns configuration-time** *seconds*

> **no clns configuration-time**

Syntax Description

seconds	Rate, in seconds, at which ES and IS hello packets are sent.

Defaults

60 seconds

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **clns configuration-time** command controls how frequently a router will send hello messages to its adjacent routers. A hello message sent by the router contains the clns-holding time that tells the receiver for how long it should consider the hello message valid. By default, the clns configuration-time is 60 seconds and the clns holding-time is 300 seconds.

⚠
Caution   Do not set the **clns configuration-time** and the **clns holding-time** so that the **clns configuration-time** is more than half of the **clns holding-time**. Doing so can lead to adjacencies being reformed. When adjacencies are being reformed, the routers at either end of the adjacency will flood their new link-state packet (LSP) routing packets throughout the network, forcing all routers to recompute the network topology. If this situation occurs repeatedly, it can have a detrimental effect on network performance.

Examples

The following example specifies that ES hellos and IS hellos are to be sent every 100 seconds:

```
clns configuration-time 100
```

Related Commands	Command	Description
	clns esct-time	Supplies an ES configuration timer option in a sent IS hello packet that tells the ES how often it should send ES hello packet PDUs.
	clns holding-time	Allows the sender of an ES hello or IS hello packet to specify the length of time you consider the information in the hello packets to be valid.

clns congestion-threshold

To set the congestion experienced bit if the output queue has more than the specified number of packets in it, use the **clns congestion-threshold** command in interface configuration mode. A *number* value of zero or the **no** form of this command prevents this bit from being set. To remove the parameter setting and set it to 0, use the **no** form of this command.

clns congestion-threshold *number*

no clns congestion-threshold

Syntax Description	*number*	Number of packets that are allowed in the output queue before the system sets the congestion-experienced bit. The value zero (0) prevents this bit from being set.

Defaults   4 packets

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   If a router configured for CLNS experiences congestion, it sets the congestion experienced bit. The congestion threshold is a per-interface parameter set by this interface configuration command. An error PDU (ERPDU) is sent to the sending router and the packet is dropped if the number of packets exceeds the threshold.

Examples   The following example sets the congestion threshold to 10:

```
interface ethernet 0
 clns congestion-threshold 10
```

clns dec-compatible

To allow IS hellos sent and received to ignore the N-selector byte, use the **clns dec-compatible** command in interface configuration mode. To disable this feature, use the **no** form of this command.

clns dec-compatible

no clns dec-compatible

Syntax Description   This command has no arguments or keywords.

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example enables DEC-compatible mode:

```
interface ethernet 0
 clns dec-compatible
```

clns enable

If you do not intend to perform any dynamic routing on an interface, but intend to pass ISO CLNS packet traffic to end systems, use the **clns enable** command in interface configuration mode. To disable ISO CLNS on a particular interface, use the **no** form of this command.

clns enable

no clns enable

Syntax Description   This command has no arguments or keywords.

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example enables ISO CLNS on Ethernet interface 0:

```
interface ethernet 0
 clns enable
```

clns erpdu-interval

To determine the minimum interval time, in milliseconds, between error ERPDUs, use the **clns erpdu-interval** command in interface configuration mode. To turn off the interval rate and effectively set no limit between ERPDUs, use the **no** form of this command or a *milliseconds* value of zero.

clns erpdu-interval *milliseconds*

no clns erpdu-interval *milliseconds*

Syntax Description	*milliseconds*	Minimum interval time (in milliseconds) between ERPDUs.

Defaults   10 ms

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   This command prevents the router from sending ERPDUs more frequently than 1 per interface per 10 ms. It is wise not to send an ERPDU frequently if bandwidth is precious (such as over slow serial lines).

Examples   The following example sets the ERPDU interval to 30 ms:

```
interface ethernet 0
 clns erpdu-interval 30
```

Related Commands

Command	Description
clns send-erpdu	Allows CLNS to send an error PDU when the routing software detects an error in a data PDU.

clns esct-time

To supply an ES configuration timer option in a transmitted IS hello packet that tells the ES how often it should transmit ES hello packet PDUs, use the **clns esct-time** command in interface configuration mode. To restore the default value and disable this function, use the **no** form of this command.

> **clns esct-time** *seconds*

> **no clns esct-time** *seconds*

Syntax Description	*seconds*	Time, in seconds, between ES hello PDUs. Range is from 0 to 65,535.

Defaults   0 seconds (disabled)

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example sets the ES configuration time to 10 seconds:

```
interface ethernet 0
 clns esct-time 10
```

Related Commands

Command	Description
clns configuration-time	Specifies the rate at which ES hello messages and IS hello messages are sent.
clns holding-time	Allows the sender of an ES hello or IS hello packet to specify the length of time you consider the information in the hello packets to be valid.

clns es-neighbor

To manually define adjacencies for end systems that do not support the ES-IS routing protocol, use the **clns es-neighbor** command in interface configuration mode. To delete the ES neighbor, use the **no** form of this command.

clns es-neighbor *nsap snpa*

no clns es-neighbor *nsap*

Syntax Description

nsap	Specific NSAP to map to a specific data link address.
snpa	Data link address.

Defaults

No end systems are listed.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When you do use the **clns es-neighbor** command, you will have to manually specify the NSAP-to-SNPA mapping for the adjacencies. The subnetwork point of attachment (SNPA) of the end system will depend upon what type of interface is being used to provide connectively. On LANs, the SNPA will be a MAC address.

If you have configured either the **clns router iso-igrp** or **clns router isis** interface configuration commands for a particular interface, the ES-IS routing software automatically turns ES-IS on for that interface.

It is only necessary to use static mapping for those end systems that do *not* support ES-IS. The Cisco IOS software will continue to discover dynamically those end systems that *do* support ES-IS.

Examples

The following example defines an ES neighbor on Ethernet interface 0:

```
interface ethernet 0
 clns es-neighbor 47.0004.004D.0055.0000.0C00.A45B.00 0000.0C00.A45B
```

In this case, the end system with the following NSAP, or network entity title (NET), is configured with an Ethernet MAC address of 0000.0C00.A45B:

```
47.0004.004D.0055.0000.0C00.A45B.00
```

Related Commands	Command	Description
	clns host	Defines a name-to-NSAP mapping that can then be used with commands requiring NSAPs.
	clns is-neighbor	Defines all intermediate systems that will be used when you manually specify the NSAP-to-SNPA mapping.
	show clns es-neighbors	Lists the ES neighbors that this router knows.

clns filter-expr

To combine CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions, use one or more **clns filter-expr** commands in global configuration mode. To delete the expression, use the **no** form of this command.

clns filter-expr *ename* [*term* | **not** *term* | *term* {**and** | **or** | **xor**} *term*]

no clns filter-expr *ename*

Syntax Description

ename	Alphanumeric name to apply to this filter expression.
not	(Optional) Defines a filter expression that is pattern matched only if the pattern given by *term* is not matched.
and	(Optional) Defines a filter expression that is pattern matched only if both of the patterns given by the two terms are matched.
or	(Optional) Defines a filter expression that is pattern matched if either of the patterns given by the two terms is matched.
xor	(Optional) Defines a filter expression that is pattern matched only if one of the patterns, but not both, given by the two terms are matched.
term	(Optional) Filter expression term. A term can be any of the following: • *ename*—Another, previously defined, filter expression. • *sname* (or **destination** *sname*)—A previously defined filter set name, with the filter set applied to the destination NSAP address. • **source** *sname*—A previously defined filter set name, with the filter set applied to the source NSAP address.

Defaults   No filter expression is defined.

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Filter expressions can reference previously defined filter expressions, so you can build arbitrarily complex expressions.

If none of the optional keywords is used, then the command defines a simple filter expression that is pattern matched only if the pattern given by *term* is matched.

Use this command to define complex filter expressions. See the description of the **clns filter-set** global configuration command to learn how to define filter sets.

Examples   The following example defines a filter expression that matches addresses with a source address of anything besides 39.840F, and a destination address that started with 47.0005 or 47.0023, but nothing else:

```
clns filter-set US-OR-NORDUNET permit 47.0005...
clns filter-set US-OR-NORDUNET permit 47.0023
clns filter-set NO-ANSI deny 38.840F...
clns filter-set NO-ANSI permit default
!
clns filter-expr STRANGE source NO-ANSI and destination US-OR-NORDUNET
```

Related Commands

Command	Description
clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.
show clns filter-expr	Displays one or all currently defined CLNS filter expressions.

clns filter-set

To build a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions, use the **clns filter-set** command in global configuration mode. CLNS filter expressions are used in the creation and use of CLNS access lists. To delete the entire filter set, use the **no** form of this command.

clns filter-set *name* [**permit** | **deny**] *template*

no clns filter-set *name*

Syntax Description		
	name	Alphanumeric name to apply to this filter set.
	permit	**deny**	(Optional) Addresses matching the pattern specified by *template* are to be permitted or denied. If neither **permit** nor **deny** is specified, **permit** is assumed.
	template	Address template, template alias name, or the keyword **default**. Address templates and alias names are described under the description of the **clns template-alias** global configuration command. The **default** keyword denotes a zero-length prefix and matches any address.

Defaults

No address templates are defined.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to define a list of pattern matches and permit/deny conditions for use in CLNS filter expressions. Filter expressions are used in the creation and use of CLNS access lists. See the description of the **clns filter-expr** global configuration command to learn how to define filter expressions and the **clns template-alias** global configuration command to learn how to define address templates and address template aliases.

Each address that must be matched against a filter set is first compared against all the entries in the filter set, in order, for an exact match with the address. If the exact match search fails to find a match, then the entries in the filter set containing wildcard matches are scanned for a match, again, in order. The first template that matches is used. If an address does not match any of the filter set entries, an implicit "deny" is returned as the permit/deny action of the filter set.

Examples

The following example returns a permit action if an address starts with either 47.0005 or 47.0023. It returns an implicit deny action on any other address.

```
clns filter-set US-OR-NORDUNET permit 47.0005...
clns filter-set US-OR-NORDUNET permit 47.0023...
```

The following example returns a deny action if an address starts with 39.840F, but returns a permit action for any other address:

```
clns filter-set NO-ANSI deny 38.840F...
clns filter-set NO-ANSI permit default
```

Related Commands

Command	Description
clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.
show clns filter-set	Displays one or all currently defined CLNS filter sets.

clns holding-time

To allow the sender of an ES hello or IS hello to specify the length of time for which you consider the information in the hello packets to be valid, use the **clns holding-time** command in global configuration mode. To restore the default value (300 seconds, or 5 minutes), use the **no** form of this command.

clns holding-time *seconds*

no clns holding-time

Syntax Description	*seconds*	Length of time, in seconds, during which the information in the hello packets is considered valid.

Defaults   300 seconds (5 minutes)

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Setting this value too high puts extra traffic on a line and adds time to process hellos. However, you want to avoid setting it too low if your topology changes more often than Cisco IOS software sends updates.

Examples   The following example sets the holding time at 150 seconds:

```
clns holding-time 150
```

Related Commands

Command	Description
clns configuration-time	Specifies the rate at which ES hello messages and IS hello messages are sent.
clns esct-time	Supplies an ES configuration timer option in a sent IS hello packet that tells the ES how often it should send ES hello packet PDUs.

clns host

To define a name-to-NSAP mapping that can then be used with commands that require NSAPs, use the **clns host** command in global configuration mode.

clns host *name nsap*

Syntax Description

name	Desired name for the NSAP. The first character can be either a letter or a number, but if you use a number, the operations you can perform are limited.
nsap	NSAP to which that the name maps.

Defaults　　No mapping is defined.

Command Modes　　Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines　　The assigned NSAP name is displayed, where applicable, in **show** and **debug** EXEC commands. There are some effects and requirements associated with using names to represent network entity titles (NETs) and NSAPs, however. Although using names as proxies for addresses is allowed with CLNS commands, they are never written out to nonvolatile random-access memory (NVRAM).

The first character can be either a letter or a number, but if you use a number, the operations you can perform (such as **ping**) are limited.

The **clns host** command is generated after all other CLNS commands when the configuration file is parsed. As a result, the NVRAM version of the configuration cannot be edited to specifically change the address defined in the original **clns host** command. You must specifically change any commands that refer to the original address. This affects all commands that accept names.

The commands that are affected by these requirements include the following:

- **net** (router configuration command)
- **clns is-neighbor** (interface configuration command)
- **clns es-neighbor** (interface configuration command)
- **clns route** (global configuration command)

Examples　　The following example defines names to NSAPs:

```
clns host cisco1 39.0001.0000.0c00.1111.00
clns host cisco2 39.0002.0000.0c00.1111.00
router iso-igrp
 net cisco1
!
interface ethernet 0
 clns net cisco2
```

	Command	Description
Related Commands	**clns es-neighbor**	Defines all end systems that will be used when you manually specify the NSAP-to-SNPA mapping.
	clns is-neighbor	Defines all intermediate systems that will be used when you manually specify the NSAP-to-SNPA mapping.
	net	Configures a NET for a CLNS routing process.

clns is-neighbor

To manually define adjacencies for intermediate systems, use the **clns is-neighbor** command in interface configuration mode. To delete the specified IS neighbor, use the **no** form of this command.

clns is-neighbor *nsap snpa*

no clns is-neighbor *nsap*

Syntax Description

nsap	NSAP of a specific intermediate system to enter as neighbor to a specific data link address.
snpa	Data link address.

Defaults

No intermediate systems are listed.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When you do use the **clns is-neighbor** command, you will have to manually specify the NSAP-to-SNPA mapping for the adjacencies. The subnetwork point of attachments (SNPAs) are the MAC addresses. The SNPA of the end system will depend upon what type of interface is being used to provide connectively. On LANs, the SNPA will be a MAC address.

It is sometimes preferable for a router to have a neighbor entry statically configured rather than learned through ES-IS, ISO IGRP, or IS-IS. This interface configuration command enters an IS neighbor.

Examples

The following example defines an IS neighbor on Ethernet interface 0:

```
interface ethernet 0
 clns is-neighbor 47.0004.004D.0055.0000.0C00.A45B.00 0000.0C00.A45B
```

Related Commands

Command	Description
clns es-neighbor	Defines all end systems that will be used when you manually specify the NSAP-to-SNPA mapping.
clns host	Defines a name-to-NSAP mapping that can then be used with commands requiring NSAPs.
show clns is-neighbors	Displays IS-IS related information for IS-IS router adjacencies.

clns mtu

To set the maximum transmission unit (MTU) packet size for the interface, use the **clns mtu** command in interface configuration mode. To restore the default and maximum packet size, use the **no** form of this command.

> **clns mtu** *bytes*

> **no clns mtu**

Syntax Description

bytes	Maximum packet size in bytes. The minimum value is 512; the default and maximum packet size depend on the interface type.

Defaults Depends on interface type

Command Modes Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines All interfaces have a default maximum packet size. You can set the MTU size of the packets sent on the interface with the **mtu** interface configuration command.

All routers on a physical medium must have the same protocol MTU in order to operate.

The CTR card does not support the switching of frames larger than 4472 bytes. Interoperability problems can occur if CTR cards are intermixed with other Token Ring cards on the same network. These problems can be minimized by lowering the CLNS MTUs to be the same on all routers on the network with the **clns mtu** command.

> **Note** Changing the MTU value with the **mtu** interface configuration command can affect the CLNS MTU value. If the CLNS MTU is at its maximum given the interface MTU, the CLNS MTU will change with the interface MTU. However, the reverse is not true; changing the CLNS MTU value has no effect on the value for the **mtu** interface configuration command.

Examples The following example sets the MTU packet size to 1000 bytes:

```
interface ethernet 0
 clns mtu 1000
```

Related Commands	Command	Description
	mtu	Adjusts the maximum packet size or MTU size.

clns net (global)

To assign a static address for a router, use the **clns net** command in global configuration mode. If the Cisco IOS software is configured to support ISO CLNS, but is not configured to dynamically route CLNS packets using ISO IGRP or IS-IS, use this command to assign an address to the router. To remove any previously configured NET or NSAP address, use the **no** form of this command.

clns net {*net-address* | *name*}

no clns net {*net-address* | *name*}

Syntax Description

net-address	NET address. Refer to the "Usage Guidelines" section.
name	CLNS host name to be associated with this interface.

Defaults

No static address is assigned.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

A CLNS packet sent to any of the defined NSAPs or NETs will be received by the router. The Cisco IOS software chooses the NET to use when it sends a packet with the following algorithm:

- If no dynamic routing protocol is running, use the NET defined for the outgoing interface if it exists; otherwise, use the NET defined for the router.
- If ISO IGRP is running, use the NET of the routing process that is running on this interface.
- If IS-IS is running, use the NET of the IS-IS routing process that is running on this interface.

Examples

The following example assigns a static address:

```
clns net 49.0001.aa00.0400.9105.00
```

clns packet-lifetime

To specify the initial lifetime for locally generated packets, use the **clns packet-lifetime** command in global configuration mode. To remove the parameter's settings, use the **no** form of this command.

clns packet-lifetime *seconds*

no clns packet-lifetime

Syntax Description	*seconds* Packet lifetime in seconds.

Defaults 32 seconds

Command Modes Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples The following example sets a packet lifetime of 120 seconds:

```
clns packet-lifetime 120
```

Related Commands

Command	Description
clns want-erpdu	Specifies whether to request ERPDUs on packets sourced by the router.

clns rdpdu-interval

To determine the minimum interval time between redirect PDUs (RDPDUs), use the **clns rdpdu-interval** command in interface configuration mode. To turn off the interval rate and effectively set no limit between RDPDUs, use the **no** form of this command or a *milliseconds* value of zero.

clns rdpdu-interval *milliseconds*

no clns rdpdu-interval *milliseconds*

Syntax Description	*milliseconds*	Minimum interval time in milliseconds between RDPDUs.

Defaults 100 ms

Command Modes Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines RDPDUs are rate-limited and are not sent more frequently than one per interface per 100 ms. There is no need to change the default. This setting will work fine for most networks.

Examples The following example sets an interval of 50 ms:

```
interface ethernet 0
 clns rdpdu-interval 50
```

Related Commands

Command	Description
clns send-rdpdu	Allows CLNS to send RPDUs when a better route for a given host is known.

clns route (create)

To create an interface static route, use this form of the **clns route** command in global configuration mode. To remove this route, use the **no** form of this command.

clns route *nsap-prefix type number* [*snpa-address*]

no clns route *nsap-prefix*

Syntax Description

nsap-prefix	Network service access point prefix. This value is entered into a static routing table and used to match the beginning of a destination NSAP. The longest NSAP-prefix entry that matches is used.
type	Interface type.
number	Interface number.
snpa-address	(Optional) Specific subnetwork point of attachment (SNPA) address. Optional for serial links; required for multiaccess networks.

Defaults

No interface static routes are created.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

CLNS static routes will not be used to route traffic to a destination for which there is a dynamic route, if that destination is within the domain (ISO-IGRP) or area (IS-IS) of the router.

Note If you do not specify an SNPA address when you have a multiaccess network, you will receive an error message indicating a bad SNPA.

Examples

The following example creates a static route for an Ethernet interface:

```
clns route 39.0002 ethernet 3 aa00.0400.1111
```

The following example creates a static route for a serial interface:

```
clns route 39.0002 serial 0
```

Related Commands	Command	Description
	clns route (enter)	Enters a specific static route.
	clns route default	Configures a default zero-length prefix rather than typing an NSAP prefix.
	clns route discard	Explicitly tells a router to discard packets with NSAP addresses that match the specified nsap-prefix.

clns route (enter)

To enter a specific static route, use this form of the **clns route** command in global configuration mode. NSAPs that start with *nsap-prefix* are forwarded to *next-hop-net* or the *name* of the next hop. To remove this route, use the **no** form of this command.

clns route *nsap-prefix* {*next-hop-net* | *name*}

no clns route *nsap-prefix*

Syntax Description

nsap-prefix	Network service access point prefix. This value is entered into a static routing table and used to match the beginning of a destination NSAP. The longest NSAP-prefix entry that matches is used.
next-hop-net	Next-hop NET. This value is used to establish the next hop of the route for forwarding packets.
name	Name of the next hop node. This value can be used instead of the next-hop NET to establish the next hop of the route for forwarding packets.

Defaults

No static route is entered.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

CLNS static routes will not be used to route traffic to a destination for which there is a dynamic route, if that destination is within the domain (ISO-IGRP) or area (IS-IS) of the router.

Examples

The following example forwards all packets toward the specified route:

```
clns route 39.840F 47.0005.80FF.FF00.0123.4567.89AB.00
```

Related Commands	Command	Description
	clns route (create)	Creates an interface static route.
	clns route default	Configures a default zero-length prefix rather than typing an NSAP prefix.
	clns route discard	Explicitly tells a router to discard packets with NSAP addresses that match the specified nsap-prefix.

clns route default discard

To assign a default discard route and automatically discard packets with NSAP addresses that do not match any existing routes, use the **clns route default discard** command in global configuration mode. To remove the default discard route, use the **no** form of this command.

clns route default discard

no clns route default discard

Syntax Description   This command has no arguments or keywords.

Defaults   Disabled

Command Modes   Global configuration

Command History

Release	Modification
11.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The only time you would use this command is if you are using static routing and ES-IS and you wish disable ES-IS and therefore reduce the router to using purely static routing. Using this command will reduce the functionality of the router by forcing ISO CLNS to ignore all nodes that were learned through ES-IS.

Note   This command will have little or no affect if you are using a dynamic routing process such as IS-IS or ISO-IGRP, as the router will discard any packets for which it does not have a route, even if this command has not been entered.

Examples   The following example assigns a default discard route:

```
clns route default discard
```

When you enter the enter the **show clns route** command, you will see the following default discard route information:

```
Router# show clns route

Codes: C - connected, S - static, d - DecnetIV
I - ISO-IGRP, i - IS-IS, e - ES-IS
S Default Prefix [10/0], Discard Entry
```

Related Commands	Command	Description
	clns route discard	Explicitly tells a router to discard packets with NSAP addresses that match the specified nsap-prefix.
	show clns route	Displays all of the destinations to which this router knows how to route packets.

clns route default

To configure a default zero-length prefix rather than type an NSAP prefix, use the **clns route default** command in global configuration mode. To remove this route, use the **no** form of this command.

clns route default *type number*

no clns route default

Syntax Description

type	Interface type. Specify the interface type immediately followed by the interface number; there is no space between the two.
number	Interface number.

Defaults   No default prefix is configured.

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example configures a default zero-length prefix:

```
clns route default ethernet0
```

Related Commands

Command	Description
clns route (interface static route)	Creates an interface static route.
clns route (enter)	Enters a specific static route.
clns route discard	Explicitly tells a router to discard packets with NSAP addresses that match the specified nsap-prefix.

clns route discard

To explicitly tell a router to discard packets with NSAP addresses that match the specified *nsap-prefix*, use the **clns route discard** command in global configuration mode. To remove this route, use the **no** form of this command.

clns route *nsap-prefix* **discard**

no clns route *nsap-prefix*

Syntax Description		
nsap-prefix		Network service access point prefix. This value is entered into a static routing table and used to match the beginning of a destination NSAP. The longest NSAP-prefix entry that matches is used.
discard		The router discards packets with NSAPs that match the specified value for the *nsap-prefix* argument.

Defaults   No NSAP addresses are identified.

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The **decnet advertise** command and the **clns route discard** command work together when DECnet Phase IV/V conversion is enabled. Any packet with the specified CLNS NSAP prefix causes CLNS to behave as if no route were found. Because DECnet Phase IV/V conversion is enabled, the route is then looked up in the Phase IV routing table. The router that is advertising the DECnet Phase IV route converts the packet to OSI and sends it to the router that is advertising the CLNS discard static route. Once it gets there, the packet is converted back to Phase IV.

CLNS discard routes cannot be used to discard packets that are addressed to a destination for which there is a dynamic route, if that destination is within the domain (ISO IGRP) or area (IS-IS) of the router.

Examples   The following example discards packets with a destination NSAP address that matches the prefix 47.0005:

```
clns route 47.0005 discard
```

Related Commands	Command	Description
	clns route (enter)	Enters a specific static route.
	clns route (interface static route)	Creates an interface static route.
	clns route default	Configures a default zero-length prefix rather than typing an NSAP prefix.
	decnet advertise	Configures border routers to propagate Phase IV areas through an OSI backbone.

clns route-cache

To allow fast switching through the cache, use the **clns route-cache** command in interface configuration mode. To disable fast switching, use the **no** form of this command.

clns route-cache

no clns route-cache

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The cache still exists and is used after the **no clns route-cache** command is used; the software just does not do fast switching through the cache.

Examples   The following example allows fast switching through the cache:

```
interface ethernet 0
 clns route-cache
```

clns router isis

To configure an Intermediate System-to-Intermediate System (IS-IS) routing process for ISO Connectionless Network Service Protocol (CLNS) on a specified interface and to attach an area designator to the routing process, use the **clns router isis** command in interface configuration mode. To disable IS-IS for ISO CLNS, use the **no** form of the command.

clns router isis *area-tag*

no clns router isis *area-tag*

Syntax Description	*area-tag*	Required for multiarea IS-IS configuration. Optional for conventional IS-IS configuration.
		Defines a meaningful name for an area routing process. If not specified, a null tag is assumed. It must be unique among all CLNS router processes for a given router. The *area-tag* argument is used later as a reference to this area routing process.
		Each area in a multiarea configuration should have a non-null area tag to facilitate identification of the area.

Defaults No routing processes are specified.

Command Modes Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.0(5)T	Multiarea functionality for ISO CLNS was added, changing the way the *tag* argument (now *area-tag*) is used.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines Before the IS-IS router process is useful, a network entity title (NET) must be assigned with the **net** command and some interfaces must be enabled with IS-IS.

If you have IS-IS running and at least one ISO-IGRP process, the IS-IS process and the ISO-IGRP process cannot both be configured without an area tag. The null tag can be used by only one process. If you run ISO-IGRP and IS-IS, a null tag can be used for IS-IS, but not for ISO-Interior Gateway Routing Protocol (IGRP) at the same time. However, each area in an IS-IS multiarea configuration should have a non-null area tag to facilitate identification of the area.

Note The IS-IS multiarea feature is not supported for IP.

You can configure only one process to perform Level 2 (interarea) routing. If Level 2 routing is configured on any process, all additional processes are automatically configured as Level 1. You can configure this process to perform intra-area (Level 1) routing at the same time. You can configure up to 29 additional processes as Level 1-only processes. Use the **is-type** command to remove Level 2 routing from a router instance. You can then use the **is-type** command to enable Level 2 routing on some other IS-IS router instance.

Note The CPU memory required to run 29 Level 1 ISIS processes will probably not be present in low-end platforms unless the routing information and area topology are limited.

An interface cannot be part of more than one area, except in the case where the associated routing process is performing both Level 1 and Level 2 routing. On media (such as WAN media, for example) where subinterfaces are supported, different subinterfaces could be configured for different areas.

Examples The following example enables IS-IS routing for ISO CLNS on Ethernet interface 0:

```
router isis cisco
 net 39.0001.0000.0c00.1111.00
interface ethernet 0
 clns router isis cisco
```

The following example shows an IS-IS configuration with two Level 1 areas and one Level 1-2 area:

```
clns routing

...

interface Tunnel529
 clns router isis BB

interface Ethernet1
 clns router isis A3253-01
!
interface Ethernet2
 clns router isis A3253-02

...

router isis BB                        ! Defaults to "is-type level-1-2"
 net 49.2222.0000.0000.0005.00
!
router isis A3253-01
 net 49.0553.0001.0000.0000.0005.00
 is-type level-1
!
router isis A3253-02
 net 49.0553.0002.0000.0000.0005.00
 is-type level-1
```

Related Commands

Command	Description
router isis	Enables the IS-IS routing protocol and specifies an IS-IS process for IP.

clns router iso-igrp

To specify ISO IGRP routing on a specified interface, use the **clns router iso-igrp** command in interface configuration mode. To disable ISO IGRP routing for the system, use the **no** form of the global configuration command with the appropriate tag.

clns router iso-igrp *tag* [**level 2**]

no clns router iso-igrp *tag*

Syntax Description	

tag	Meaningful name for routing process. It must be unique among all CLNS router processes for a given router. This tag should be the same as defined for the routing process in the **router iso-igrp** global configuration command.
level 2	(Optional) Allows the interface to advertise Level 2 information.

Defaults   ISO IGRP routing is not specified on any interface.

Command Modes   Interface configuration

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   If you want this interface to advertise Level 2 information only, use the **level 2** keyword. This option reduces the amount of router-to-router traffic by telling Cisco IOS software to send out only Level 2 routing updates on certain interfaces. Level 1 information is not passed on the interfaces for which the Level 2 option is set.

Examples   In the following example, the interface advertises Level 2 information only on serial interface 0:

```
router iso-igrp marketing
 net 49.0001.0000.0c00.1111.00
interface serial 0
 clns router iso-igrp marketing level 2
```

Related Commands	Command	Description
	router iso-igrp	Identifies the area the router will work in and informs it that it will route dynamically using the ISO IGRP protocol.

clns routing

To enable routing of CLNS packets, use the **clns routing** command in global configuration mode. To disable CLNS routing, use the **no** form of this command.

clns routing

no clns routing

Syntax Description   This command has no arguments or keywords.

Defaults   Disabled

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples   The following example enables routing of CLNS packets:

```
clns routing
```

Related Commands

Command	Description
clns security pass-through	Allows Cisco IOS software to pass packets that have security options set.

clns security pass-through

To allow Cisco IOS software to pass packets that have security options set, use the **clns security pass-through** command in global configuration mode. To disable this function, use the **no** form of this command.

clns security pass-through

no clns security pass-through

Syntax Description

This command has no arguments or keywords.

Defaults

The software discards any packets it sees as set with security options.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example allows Cisco IOS software to pass packets that have security options set:

```
clns routing
router iso-igrp
 net 47.0004.004d.0001.0000.0c11.1111.00
clns security pass-through
```

Related Commands

Command	Description
clns routing	Enables routing of CLNS packets.

clns send-erpdu

To allow CLNS to send an error PDU when the routing software detects an error in a data PDU, use the **clns send-erpdu** command in interface configuration mode. To disable this function, use the **no** form of this command.

clns send-erpdu

no clns send-erpdu

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   When a CLNS packet comes in, the routing software looks in the routing table for the next hop. If it does not find the next hop, the packet is discarded and an ERPDU can be sent to the original source/sender of the packet that was discarded.

Examples   The following example allows CLNS to send an error PDU when it detects an error in a data PDU:

```
interface ethernet 0
 clns send-erpdu
```

Related Commands

Command	Description
clns erpdu-interval	Determines the minimum interval time, in milliseconds, between error ERPDUs.

clns send-rdpdu

To allow CLNS to redirect PDUs (RDPDUs) when a better route for a given host is known, use the **clns send-rdpdu** command in interface configuration mode. To disable this function, use the **no** form of this command.

clns send-rdpdu

no clns send-rdpdu

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   If a packet is sent out on the same interface it came in on, an RDPDU can also be sent to the sender of the packet.

Examples   The following example allows CLNS to send RDPDUs:

```
interface ethernet 0
 clns send-rdpdu
```

Related Commands

Command	Description
clns erpdu-interval	Determines the minimum interval time (in milliseconds) between RDPDUs.

clns split-horizon

To implement split horizon for ISO IGRP updates, use the **clns split-horizon** command in interface configuration mode. To disable this function, use the **no** form of this command.

clns split-horizon

no clns split-horizon

Syntax Description   This command has no arguments or keywords.

Defaults   For all LAN interfaces—enabled

For WAN interfaces on X.25, Frame Relay, or SMDS networks—disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Normally, routers that are connected to broadcast-type OSI networks and that use distance vector routing protocols employ the split-horizon mechanism to prevent routing loops. Split-horizon blocks information about routes from being advertised by a router out any interface from which that information originated. This behavior usually optimizes communications among multiple routers, particularly when links are broken. However, with nonbroadcast networks, such as Frame Relay and SMDS, situations can arise for which this behavior is less than ideal. For all interfaces except those for which either Frame Relay or SMDS encapsulation is enabled, the default condition for this command is for split horizon to be enabled.

If your configuration includes either the **encapsulation frame-relay** or **encapsulation smds** interface configuration commands, the default is for split horizon to be disabled. Split horizon is not disabled by default for interfaces using any of the X.25 encapsulations.

For networks that include links over X.25 PSNs, the **neighbor** interface configuration command can be used to defeat the split horizon feature. You can as an alternative explicitly specify the **no clns split-horizon** command in your configuration. However, if you do so, you must similarly disable split horizon for all routers in any relevant multicast groups on that network.

Split horizon for ISO IGRP defaults to off for X.25, SMDS, and Frame Relay. Thereby, destinations are advertised out the interface for which the router has a destination.

In general, changing the state of the default for this interface configuration command is not recommended, unless you are certain that your application requires making a change in order to properly advertise routes. Remember that if split horizon is disabled on a serial interface (and that interface is attached to a packet-switched network), you must disable split horizon for all routers in any relevant multicast groups on that network.

Examples   The following example disables split horizon on a serial link connected to an X.25 network:

```
interface serial 0
 encapsulation x25
 no clns split-horizon
```

clns template-alias

To build a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets, use one or more **clns template-alias** commands in global configuration mode. To delete the alias, use the **no** form of this command.

clns template-alias *name template*

no clns template-alias *name*

Syntax Description	*name*	Alphanumeric name to apply as an alias for the template.
	template	Address template, as defined in the "Usage Guidelines" section.

Defaults   No alias list is defined.

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Address templates are "pattern forms" that match one or more CLNS addresses. They can be simple single CLNS addresses, which match just themselves, or contain *wildcards*, *prefixes*, and *suffixes*, allowing a single template to match many addresses.

The simplest address template matches just a single address, as shown in this example:

```
47.0005.1234.5678.9abc.def0.00
```

Wildcard digits, which can match any value, are indicated with asterisks (*). The following template matches the above address and any other 12-byte long address that starts with 47.0005.1234.5678:

```
47.0005.1234.5678.****.****.**
```

Because OSI addresses are variable in length, it is often useful to build templates that match addresses that share a common prefix. The following template matches any address of any length that begins with the prefix 47.0005.1234.5678:

```
47.0005.1234.5678...
```

In other instances, matching a suffix of the address is also important, such as when matching system IDs. The following template matches any address that ends with the suffix 0000.0c01.2345.00:

```
...0000.0c01.2345.00
```

In other cases, you might want to match addresses on a single-bit granularity, rather than half-byte (four-bit, or *nibble*) granularity. This pattern matching is supported by allowing the hex digits that represent four bits to be replaced by groups of four binary bits, represented by 0s and 1s. These four binary digits are enclosed within parentheses. The following template matches any address that starts with 47.0005 followed by the binary bits 10. The final two binary bits in the nibble can be either 0 or 1, and are represented with asterisks.

```
47.0005.(10**)...
```

Use this command to define aliases for commonly referenced address templates. The use of these aliases reduces the chances for typographical error in the creation of CLNS filter sets.

Examples

The following command defines a filter set called COMPLEX-PREFIX for the last example given in the "Usage Guidelines" section:

```
clns template-alias COMPLEX-PREFIX 47.0005.(10**)...
```

Related Commands

Command	Description
clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.

clns want-erpdu

To specify whether to request ERPDUs on packets sourced by the router, use the **clns want-erpdu** command in global configuration mode. To remove the parameter's settings, use the **no** form of this command.

clns want-erpdu

no clns want-erpdu

Syntax Description This command has no arguments or keywords.

Defaults To request ERPDUs

Command Modes Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines This command has no effect on routing packets (ES-IS, ISO IGRP, and IS-IS) sourced by the system. It applies to pings and trace route packets.

Examples The following example requests ERPDUs on packets sourced by the router:

```
clns want-erpdu
```

Related Commands

Command	Description
clns packet-lifetime	Specifies the initial lifetime for locally generated packets.

ctunnel destination

To configure the destination parameter for an IP over CLNS tunnel (CTunnel), use the **ctunnel destination** command in interface configuration mode. To remove the destination parameter, use the **no** form of this command.

> **ctunnel destination** *nsap-address*

> **no ctunnel destination** *nsap-address*

Syntax Description

nsap-address	NSAP address for the CTunnel destination.

Defaults

No default behavior or values.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When creating an IP over CLNS tunnel, you must first create the virtual interface by using the **interface ctunnel** command. Once you have created the virtual interface, the order in which you configure the destination parameter by using the **ctunnel destination** command and set the IP address for that destination parameter by using the **ip address** command does not matter.

Addresses in the ISO network architecture are referred to as network service access point (NSAP) addresses and network entity titles (NETs). Each node in an OSI network has one or more NETs. In addition, each node has many NSAP addresses. Each NSAP address differs from one of the NETs for that node in only the last byte. This byte is called the *N-selector*. Its function is similar to the port number in other protocol suites.

When a CTunnel interface is being configured, the N-selector of the destination NSAP address is set automatically by the router. Regardless of the value you enter for the N-selector byte, the router will select the appropriate value. You will see the value that was chosen by the router when you enter the **show interfaces ctunnel** command.

Examples

The following example configures a CTunnel from one router to another and shows the CTunnel destination set to 49.0001.1111.1111.1111.00.

```
interface ctunnel 301
 ip address 10.0.0.3 255.255.255.0
 ctunnel destination 49.0001.1111.1111.1111.00
```

Related Commands	Command	Description
	clns routing	Enables routing of CLNS packets.
	debug ctunnel	Displays debug messages for the IP over a CLNS Tunnel feature.
	interface ctunnel	Creates a virtual interface to transport IP over a CLNS tunnel.
	ip address	Sets a primary or secondary IP address for an interface.
	ip routing	Enables IP routing.

ctunnel mode

To transport IPv4 and IPv6 packets over Connectionless Network Service (CLNS) tunnel (CTunnel), use the **ctunnel mode** command in interface configuration mode. To return the ctunnel to the default **cisco** mode, use the **no** form of this command.

> **ctunnel mode** [**gre** | **cisco**]

> **no ctunnel mode**

Syntax Description		
gre	(Optional) Sets the ctunnel mode to Generic Routing Encapsulation (GRE) for transporting IPv6 packets over the CLNS network.	
cisco	(Optional) Returns the ctunnel mode to the default cisco.	

Command Default   Cisco encapsulation

Command Modes   Interface configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   GRE tunneling of IPv4 and IPv6 packets through CLNS-only networks enables Cisco ctunnels to interoperate with networking equipment from other vendors. This feature provides compliance with RFC 3147, *Generic Routing Encapsulation over CLNS Networks*, which should allow interoperation between Cisco equipment and that of other vendors. in which the same standard is implemented.

RFC 3147 specifies the use of GRE when tunneling packets. The implementation of this feature does not include support for GRE header fields such as those used to specify checksums, keys, or sequencing. Any packets received which specify the use of these features will be dropped.

The default ctunnel mode continues to use the standard Cisco encapsulation. Both ends of the tunnel must be configured with the same mode for it to work. If you want to tunnel ipv6 packets you must use the new gre mode.

Examples

The following example configures a CTunnel from one router to another and shows the CTunnel destination set to 49.0001.1111.1111.1111.00. The ctunnel mode is set to gre to transport IPv6 packets.

```
interface ctunnel 301
 ipv6 address 2001:0DB8:1111:2222::2/64
 ctunnel destination 49.0001.1111.1111.1111.00
 ctunnel mode gre
```

Related Commands

Command	Description
clns routing	Enables routing of CLNS packets.
ctunnel destination	Specifies the destination for the CTunnel.
debug ctunnel	Displays debug messages for the IP over a CLNS Tunnel feature.
interface ctunnel	Creates a virtual interface to transport IP over a CLNS tunnel.
ip address	Sets a primary or secondary IP address for an interface.

distance (ISO CLNS)

To configure the administrative distance for CLNS routes learned, use the **distance** command in router configuration mode. To restore the administrative distance to the default, use the **no** form of this command.

> **distance** *value* [**clns**]

> **no distance** *value* [**clns**]

Syntax Description	*value*	Administrative distance, indicating the trustworthiness of a routing information source. This argument has a numerical value between 0 and 255. A higher relative value indicates a lower trustworthiness rating. Preference is given to routes with smaller values.
	clns	(Optional) CLNS-derived routes for IS-IS.

Defaults

Static routes—10

ISO IGRP routes—100

IS-IS routes—110

Command Modes

Router configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When multiple routing processes are running in the same router for CLNS, it is possible for the same route to be advertised by more than one routing process.

If the router is forwarding packets, dynamic routes will always take priority over static routes, unless the router is routing to a destination outside of its domain and area. The router first will look for an ISO IGRP route within its own area, then for an ISO IGRP route within its own domain, and finally for an IS-IS route within its own area, until it finds a matching route. If a matching route still has not been found, the router will check its prefix table, which contains static routes and routes to destinations outside the area (ISO IGRP), domain (ISO IGRP), and area (IS-IS) routes for that router. When the router is using its prefix table, it will choose the route that has the lowest administrative distance.

Note The administrative distance for CLNS routes that you have configured by entering the **distance** command will take effect only when routes are entered into the routing prefix table.
If you want an ISO IGRP prefix route to override a static route, you must set the administrative distance for the routing process to be lower than 10 (assigned administrative distance for static routes). You cannot change the assigned administrative distance for static routes.

The **show clns protocol** EXEC command displays the default administrative distance for a specified routing process.

Examples In the following example, the distance value for CLNS routes learned is 90. Preference is given to these CLNS routes rather than routes with the default administrative distance value of 110.

```
router isis
 distance 90 clns
```

ignore-lsp-errors

To allow the router to ignore Intermediate System-to-Intermediate System (IS-IS) link-state packets that are received with internal checksum errors rather than purging the link-state packets, use the **ignore-lsp-errors** command in router configuration mode. To disable this function, use the **no** form of this command.

ignore-lsp-errors

no ignore-lsp-errors

Syntax Description   This command has no arguments or keywords.

Defaults   This command is enabled by default; that is, corrupted LSPs are dropped instead of purged for network stability.

Command Modes   Router configuration

Command History

Release	Modification
11.1	This command was introduced.
12.0	This command is now enabled by default.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   The IS-IS protocol definition requires that a received link-state packet with an incorrect data-link checksum be purged by the receiver, which causes the initiator of the packet to regenerate it. However, if a network has a link that causes data corruption while still delivering link-state packets with correct data link checksums, a continuous cycle of purging and regenerating large numbers of packets can occur. Because this could render the network nonfunctional, use the **ignore-lsp-errors command** to ignore these link-state packets rather than purge the packets.

Link-state packets are used by the receiving routers to maintain their routing tables.

If you want to explicitly purge the corrupted LSPs, issue the **no ignore-lsp-errors** command.

Examples   The following example instructs the router to ignore link-state packets that have internal checksum errors:

```
router isis
 ignore-lsp-errors
```

interface ctunnel

To create a virtual interface to transport IP over a CLNS tunnel (CTunnel), use the **interface ctunnel** command in global configuration mode. To remove the virtual interface, use the **no** form of this command.

interface ctunnel *interface-number*

no interface ctunnel *interface-number*

Syntax Description

interface-number	CTunnel interface number (a number from 0 through 2,147,483,647).

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

When configuring an IP over CLNS tunnel, you must first create a virtual interface. In the following example, the **interface ctunnel** command is used to create the virtual interface.

Examples

The following example configures a CTunnel from one router to another and shows the CTunnel destination set to 49.0001.1111.1111.1111.00:

```
interface ctunnel 301
 ip address 10.0.0.3 255.255.255.0
 ctunnel destination 49.0001.1111.1111.1111.00
```

Related Commands

Command	Description
clns routing	Enables routing of CLNS packets.
ctunnel destination	Configures the destination parameter for a CLNS tunnel.
debug ctunnel	Displays debug messages for the IP over a CLNS Tunnel feature.
ip address	Sets a primary or secondary IP address for an interface.
ip routing	Enables IP routing.

ip domain-lookup nsap

To allow Domain Name System (DNS) queries for CLNS addresses, use the **ip domain-lookup nsap** command in global configuration mode. To disable this function, use the **no** form of this command.

ip domain-lookup nsap

no ip domain-lookup nsap

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   With both IP and ISO CLNS enabled on a router, this feature allows you to discover a CLNS address without having to specify a full CLNS address given a host name. This feature is useful for the ISO CLNS **ping** EXEC command and when making CLNS Telnet connections.

Examples   The following example disables DNS queries of CLNS addresses:

```
no ip domain-lookup nsap
```

Related Commands

Command	Description
ip domain-lookup	Enables the IP DNS-based host name-to-address translation.
ping (privileged)	Diagnoses basic network connectivity on AppleTalk, CLNS, DECnet, IP, or Novell IPX networks.
redistribute (ISO CLNS)	Redistributes routing information from one domain into another routing domain.

isis adjacency-filter

To filter the establishment of Intermediate System-to-Intermediate System (IS-IS) adjacencies, use the **isis adjacency-filter** command in interface configuration mode. To disable filtering of the establishment of IS-IS adjacencies, use the **no** form of this command.

isis adjacency-filter *name* [**match-all**]

no isis adjacency-filter *name* [**match-all**]

Syntax Description	*name*	Name of the filter set or expression to apply.
	match-all	(Optional) All NSAP addresses must match the filter in order to accept the adjacency. If not specified (the default), only one address need match the filter in order for the adjacency to be accepted.

Defaults Disabled

Command Modes Interface configuration

Command History	Release	Modification
	10.0	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines Filtering is performed by building NSAP addresses out of incoming IS-IS hello packets by combining each area address in the hello with the system ID. Each of these NSAP addresses is then passed through the filter. If any one NSAP matches, the filter is considered "passed," unless the **match-all** keyword was specified, in which case all addresses must pass. The functionality of the **match-all** keyword is useful in performing "negative tests," such as accepting an adjacency only if a particular address is *not* present.

Filtering is performed on full NSAP addresses. If filtering should only be performed on system IDs, or any other substring of the full NSAP address, the wildcard matching capabilities of filter sets should be used to ignore the insignificant portions of the NSAP addresses.

Filter sets and expressions are described in this manual in the descriptions for the **clns filter-expr**, **clns filter-set**, and **clns template-alias** global configuration commands.

Examples The following example builds a filter that accepts adjacencies with only two systems, based only on their system IDs:

```
clns filter-set ourfriends ...0000.0c00.1234.**
clns filter-set ourfriends ...0000.0c00.125a.**
```

```
!
interface ethernet 0
 isis adjacency-filter ourfriends
```

Related Commands	Command	Description
	clns adjacency-filter	Filters the establishment of CLNS ES and IS adjacencies.
	clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
	clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
	clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.
	iso-igrp adjacency-filter	Filters the establishment of ISO IGRP adjacencies.

iso-igrp adjacency-filter

To filter the establishment of ISO IGRP adjacencies, use the **iso-igrp adjacency-filter** command in interface configuration mode. To disable filtering of the establishment of ISO IGRP adjacencies, use the **no** form of this command.

iso-igrp adjacency-filter *name*

no iso-igrp adjacency-filter *name*

Syntax Description	*name* Name of the filter set or expression to apply.

Defaults   Disabled

Command Modes   Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines   Filtering is performed on full NSAP addresses. If filtering should only be performed on system IDs, or any other substring of the full NSAP address, the wildcard matching capabilities of filter sets should be used to ignore the insignificant portions of the NSAP addresses.

For descriptions of filter sets and expressions, refer to the **clns filter-expr**, **clns filter-set**, and **clns template-alias** global configuration commands.

Examples   The following example builds a filter that accepts adjacencies with only two systems, based only on their system IDs:

```
clns filter-set ourfriends ...0000.0c00.1234.**
clns filter-set ourfriends ...0000.0c00.125a.**
!
interface ethernet 0
 iso-igrp adjacency-filter ourfriends
```

Related Commands	**Command**	**Description**
	clns adjacency-filter	Filters the establishment of CLNS ES and IS adjacencies.
	clns filter-expr	Combines CLNS filter sets and CLNS address templates to create complex logical NSAP pattern-matching expressions.
	clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
	clns template-alias	Builds a list of alphanumeric aliases of CLNS address templates for use in the definition of CLNS filter sets.
	isis adjacency-filter	Filters the establishment of IS-IS adjacencies.

lsp-mtu (ISO CLNS)

To set the maximum transmission unit (MTU) size of Intermediate System-to-Intermediate System (IS-IS) link-state packets (LSPs), use the **lsp-mtu** command in router configuration mode. To disable this function, use the **no** form of this command.

lsp-mtu *size*

no lsp-mtu

Syntax Description	*size*	Maximum packet size in bytes. The size must be less than or equal to the smallest MTU of any link in the network. The default size is 1497 bytes.

Defaults 1497 bytes

Command Modes Router configuration

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines Under normal conditions, the default MTU size should be sufficient. However, if the MTU of a link is below 1500 bytes, the link-state packet MTU must be lowered accordingly on each router in the network. If this is not done, routing becomes unpredictable.

Note This rule applies for all routers in a network. If any link in the network has a reduced MTU, all routers must be changed, not just the routers directly connected to the link.

Caution The CLNS MTU of a link (which is the applicable value for IS-IS, even if it is being used to route IP) may differ from the IP MTU. To be certain about a link MTU as it pertains to IS-IS, use the **show clns interface** command to display the value.

Examples The following example sets the MTU size to 1300 bytes:

```
router isis
 lsp-mtu 1300
```

Related Commands	Command	Description
	clns mtu	Sets the MTU packet size for the interface.
	mtu	Adjusts the maximum packet size or MTU size.