

default (VPDN)

To reset a virtual private dialup network (VPDN) group or a VPDN subgroup to its default value, use the **default** command in VPDN group or VPDN subgroup mode.

```
default {accept-dialin | accept-dialout | authen before-forward | dialer | dnis | domain |
force-local-chap | initiate-to | l2f | l2tp | lcp renegotiation | local | multilink | pool-member |
request-dialin | request-dialout | rotary-group | source-ip | terminate-from |
virtual-template}
```

Syntax Description

accept-dialin	Removes the accept-dialin group from the VPDN group.
accept-dialout	Removes the accept-dialout group from the VPDN group.
authen before-forward	Removes the authen before-forward command from the VPDN group.
dialer	Removes the dialer command from the accept-dialout group.
dnis	Removes all dnis commands from the request-dialin group.
domain	Removes all domain commands from the request-dialin group.
force-local-chap	Removes the force-local-chap command from the VPDN group.
initiate-to	Removes all initiate-to commands from the VPDN group.
l2f	Removes all l2f commands from the VPDN group.
l2tp	Removes all l2tp commands from the VPDN group.
lcp renegotiation	Removes the lcp renegotiation command from the VPDN group.
local	Removes the local command from the VPDN group.
multilink	Removes all multilink commands from the VPDN group.
pool-member	Removes the pool-member command from the request-dialout group.
request-dialin	Removes the request-dialin group from the VPDN group.
request-dialout	Removes the request-dialout group from the VPDN group.
rotary-group	Removes the rotary-group command from the request-dialout group.
source-ip	Removes the source-ip command from the VPDN group.
terminate-from	Removes the terminate-from command from the VPDN group.
virtual-template	Removes the virtual-template command from the accept-dialin group.

Defaults

Disabled

Command Modes

VPDN group

VPDN subgroup

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

Using the **default** command without a keyword is the same as using the **no** form of this command.

Examples

The following example shows an LNS configured to accept L2F dial-in and L2TP dial-out:

```
vpdn-group 1
  accept dialin
  protocol l2f
  virtual-template 1
  request dialout
  protocol l2tp
  pool-member 1
  local name reuben
  terminate-from hostname cerise
  initiate-to ip 10.3.2.1
  l2f ignore-mid-sequence
  l2tp ip udp checksum
```

If you then issue the **default protocol** command in request-dialout mode, the configuration will look like this:

```
vpdn-group 1
  accept dialin
  protocol l2f
  virtual-template 1
  request dialout
  local name reuben
  terminate-from hostname cerise
  initiate-to ip 10.3.2.1
  l2f ignore-mid-sequence
```

If you issue the **no accept dialin** command when the LNS is configured as in the first example, the configuration will change to this:

```
vpdn-group 1
  request dialout
  protocol l2tp
  pool-member 1
  local name reuben
  initiate-to ip 10.3.2.1
  l2tp ip udp checksum
```

description (interface)

To add a description to an interface configuration, use the **description** command in interface configuration mode. To remove the description, use the **no** form of this command.

description *string*

no description

Syntax Description

<i>string</i>	Comment or a description to help you remember what is attached to this interface. This string is limited to 238 characters.
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Defaults

No description is added.

Command Modes

Interface configuration

Command History

Release	Modification
9.21	This command was introduced.

Usage Guidelines

The **description** command is meant solely as a comment to be put in the configuration to help you remember what certain interfaces are used for. The description appears in the output of the following EXEC commands: **more nvram:startup-config**, **show interfaces**, and **more system:running-config**.

Examples

The following example shows how to add a description for a T1 interface:

```
interface serial 0
description Fractional T1 line to Mountain View -- 128 kbps
```

Related Commands

Command	Description
more nvram:startup-config	Displays the startup configuration file contained in NVRAM or specified by the CONFIG_FILE environment variable.
more system:running-config	Displays the running configuration.
show interfaces	Displays statistics for all interfaces configured on the router or access server.

description (vpdn-group)

To add a description to a VPDN group, use the **description** command in VPDN group configuration mode. To remove the description, use the **no** form of this command.

description *string*

no description

Syntax	Description
<i>string</i>	Comment or a description about the VPDN group.

Defaults No description is added.

Command Modes VPDN group configuration

Command History	Release	Modification
	12.2	This command was introduced.

Examples The following example shows how to enter a description for a VPDN group:

```
vpdn-group 333
description This is a VPDN group at location 333
request-dialin
protocol l2tp
domain dotty.com
initiate-to ip 10.0.0.63
local name hooty.com
```

Related Commands	Command	Description
	vpdn-group	Defines a local, unique group name or number identifier.

dialer

To specify the dialer interface that an accept-dialout virtual private dialup network (VPDN) subgroup will use to dial out calls, use the **dialer** command in accept-dialout configuration mode. To remove the dialer interface from the accept-dialout VPDN subgroup, use the **no** form of this command.

dialer *dialer-interface*

no dialer

Syntax Description	<i>dialer-interface</i> Number of the dialer interface.
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Defaults	Disabled
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Command Modes	Accept-dialout configuration
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Command History	Release	Modification
	12.0(5)T	This command was introduced.

Usage Guidelines	<p>You must first enable Layer 2 Tunneling Protocol (L2TP) on the accept-dialout VPDN subgroup by using the protocol l2tp command before you can enable the dialer command. Removing the protocol command will remove the dialer command from the accept-dialout subgroup.</p>
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You can only specify one dialer per accept dialout group. Configuring a second **dialer** command will replace the first **dialer** command.

Examples	The following example creates an accept-dialout VPDN subgroup that uses dialer interface 2:
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```

VPDN-group 1
  accept dialout
  protocol l2tp
  dialer 2
  terminate-from hostname cerise

```

Related Commands	Command	Description
	accept-dialout	Accepts requests to tunnel L2TP dial-out calls and creates an accept-dialout VPDN subgroup.
	protocol (VPDN)	Specifies the L2TP that the VPDN subgroup will use.
	terminate-from	Specifies the host name of the remote LAC or LNS that will be required when accepting a VPDN tunnel.

dialer callback-secure

To enable callback security, use the **dialer callback-secure** command in interface configuration mode. To disable callback security, use the **no** form of this command.

dialer callback-secure

no dialer callback-secure

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Interface configuration

Release	Modification
11.0	This command was introduced.

Usage Guidelines This command affects those users that are not authorized to be called back through configuration of the **dialer callback-server** command. If the username (the *host-name* argument in the **dialer map** command) is not authorized for callback, the call will be disconnected if the **dialer callback-secure** command is configured.

Examples The following partial example configures BRI0 with the commands required to make it function as the callback server on the shared network. Callback security is enabled on BRI0, such that any user other than user1 will be disconnected and not called back.

```
interface BRI0
 ip address 172.19.1.9 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 172.19.1.8 name user1 class dial1 81012345678901
 dialer-group 1
 ppp callback accept
 ppp authentication chap
!
map-class dialer dial1
 dialer callback-server username
```

Related Commands	Command	Description
	dialer callback-server	Enables an interface to make return calls when callback is successfully negotiated.
	dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.
	ppp callback (DDR)	Enables a dialer interface that is not a DTR interface to function either as a callback client that requests callback or as a callback server that accepts callback requests.

dialer callback-server

To enable an interface to make return calls when callback is successfully negotiated, use the **dialer callback-server** command in interface configuration mode. To disable return calls, use the **no** form of this command.

dialer callback-server [username dialstring]

no dialer callback-server

Syntax Description

username	(Optional) Looks up the authenticated host name in a dialer map command. This is the default.
dialstring	(Optional) Identifies the return call during callback negotiation.

Defaults

Disabled. The default keyword is **username**.

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.

Examples

The following partial example configures BRI 0 to function as the callback server on the shared network:

```
interface BRI0
 ip address 172.19.1.9 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 172.19.1.8 name atlanta class dial1 81012345678901
 dialer-group 1
 ppp callback accept
 ppp authentication chap
!
map-class dialer dial1
 dialer callback-server username
```

Related Commands

Command	Description
dialer callback-secure	Enables callback security.
dialer enable-timeout	Sets the length of time an interface stays down after a call has completed or failed and before the interface is available to dial again.
dialer hold-queue	Allows interesting outgoing packets to be queued until a modem connection is established.
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.

Command	Description
map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.
ppp callback (DDR)	Enables a dialer interface that is not a DTR interface to function either as a callback client that requests callback or as a callback server that accepts callback requests.

dialer called

To configure dial-on-demand routing (DDR) to perform DNIS-plus-ISDN-subaddress binding for dialer profile interfaces, use the **dialer called** command in dial-on-demand routing configuration mode. To disable DNIS-plus-ISDN-subaddress binding, use the **no** form of this command.

dialer called *DNIS:subaddress*

no dialer called *DNIS:subaddress*

Syntax Description

DNIS:subaddress Dialed Number Identification Service or the called party number, a colon, and the ISDN subaddress.

Defaults

No default behavior or values.

Command Modes

Dial-on-demand routing configuration

Command History

Release	Modification
12.0(4)T	This command was introduced.

Usage Guidelines

If you have more than one DNIS-plus-ISDN-subaddress number to configure under the same dialer profile interface, you can configure multiple **dialer called** commands.

The parser accepts a **dialer called** command with a DNIS and without the subaddress; however, the call will fail. For a successful call, enter the DNIS, a colon, and the ISDN subaddress after the **dialer called** command.

Examples

The following example configures a dialer profile for a receiver with DNIS 12345 and ISDN subaddress 6789:

```
dialer called 12345:6789
```

Related Commands

Command	Description
dialer caller	Configures caller ID screening and, optionally, enables ISDN caller ID callback for legacy DDR or the dialer profiles DDR feature.

dialer caller

To configure caller ID screening for a dialer rotary group interface or to bind an incoming call to a particular dialer profile, and, optionally, to enable ISDN caller ID callback, use the **dialer caller** command in interface configuration mode. To disable this feature, use the **no** form of this command.

dialer caller *number* [**callback**]

no dialer caller *number* [**callback**]

Syntax Description

<i>number</i>	Remote telephone number for which to screen. Use a lower case letter x to represent a single “don’t care” digit. The maximum length of each number is 25 characters.
callback	(Optional) Enables callback.

Defaults

Caller ID screening, call binding, and ISDN caller ID callback are disabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

On a dialer rotary group interface, this command configures the Cisco IOS software to accept calls from the specified number or, used with the **callback** keyword, to reject incoming calls from the specified number but to initiate callback to the number.

When the optional **callback** keyword is used, the initial call is rejected (hence, not subject to tolls) and callback is initiated to the calling number.

When x’s are used in the callback number, dialer caller screening is based on a best match system that uses the number of x’s as a criterion. To make callback calls only to specified numbers or ranges of numbers but to accept any other incoming calls, make sure that the number of x’s in any configuration line that uses the **callback** keyword is less than the number of x’s in any configuration line that does not use the keyword.

For example, if you use at most four x’s in the configuration lines with the **callback** keyword, then to accept calls from other numbers use at least five x’s in a configuration line that does not use the **callback** keyword.



Note

Caller ID screening requires a local switch that is capable of delivering the caller ID to the router or access server. If you enable caller ID screening but do not have such a switch, no calls will be allowed in.

For dialer profiles, this command helps bind a dialer profile to—and thus configure—the interface used for a call. The dialer command acts as a binding command by associating an incoming call with a specified dialer profile if the caller ID presented by the call matches the dialer caller value.

**Note**

Incoming calls also can be bound to a dialer profile based on PPP name authentication, so in this instance the incoming call can be bound to the dialer profile even if the presented caller ID does not match the dialer caller value. To configure caller ID screening with dialer profiles, use the legacy **isdn caller** command.

Examples

In the following example, callback calls will be made only to numbers in the 555 and 556 exchanges, but any other number can call in:

```
dialer caller 408555xxxx callback
dialer caller 408556xxxx callback
dialer caller xxxxxx
```

Related Commands

Command	Description
isdn caller	Configures ISDN caller ID screening and, optionally, enables ISDN caller ID callback for legacy DDR.
show dialer	Displays general diagnostic information for interfaces configured for DDR.

dialer clid group

To create a Calling Line Identification (CLID) group in the resource pool and assign it a name, use the **dialer clid group** command in global configuration mode. To remove a CLID group from the resource pool, use the **no** form of this command.

dialer clid group *clid-group-name*

no dialer clid group *clid-group-name*

Syntax Description

clid-group-name Name of the CLID group created in the resource pool.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

Use the **dialer clid group** command to create a CLID group and assign it a name. The CLID group name must be the same as the name used when configuring the customer profile.

Customer profiles are configured with a DNIS and/or CLID group and call type. The DNIS and/or CLID and call type of the incoming call is used to find the appropriate customer profile.

Examples

The following example shows the command to configure a CLID group named **zot**. After you enter this command, the router prompt changes to the CLID configuration mode—`Router(config-clid-group)#`.

```
Router(config)# dialer clid group zot
Router(config-clid-group)#
```

Related Commands

Command	Description
number	Adds a DNIS number to a dialer DNIS group.
resource-pool call treatment discriminator	Configures a CLID group in a discriminator.

dialer congestion-threshold

To specify congestion threshold in connected links, use the **dialer congestion-threshold** command in interface configuration mode. To disable this function, use the **no** form of this command.

dialer congestion-threshold *links*

no dialer congestion-threshold

Syntax Description	<i>links</i>	Number of connected links for congestion threshold in the range 0 to 64,000.
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Defaults	The default number of connected links is 64,000.
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Command Modes	Interface configuration
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Command History	Release	Modification
	12.0(3)T	This command was introduced.

Usage Guidelines	This command is used to force the dialer to search for another uncongested system (the alternate network access server) in a stack group to dial out using Stack Group Bidding Protocol (SGBP).
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Examples	The following example sets the congestion threshold to five connected links on the Dialer interface 0:
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```
interface Dialer0
dialer aaa
dialer congestion-threshold 5
```

Related Commands	Command	Description
	dialer reserved-links	Reserves links for dial-in and dial-out.
sgbp dial-bids	Allows the stack group to bid for dial-out connection.	

dialer dnis group

To create a DNIS group, use the **dialer dnis group** command in global configuration mode. To remove a specific Dialed Number Identification Service (DNIS) group from the running configuration, use the **no** form of this command.

dialer dnis group *name*

no dialer dnis group *name*

Syntax Description

<i>name</i>	Name to assign to the DNIS group number.
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Defaults

A dialer DNIS group named default.

Command Modes

Global configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.

Usage Guidelines

Use the **dialer dnis group** global configuration command to create a DNIS group. This command enables you to create and populate a DNIS group, which is then added to a profile (customer or discriminator) by using the **dnis group** command within that profile's configuration mode.

Examples

The following example shows a specific DNIS group named modem-group1 being created with the options available for further configuration:

```
dialer dnis group modem-group1
```

```
Dialer Called Configuration Commands:
  call-type set call-type override
  default   Set a command to its defaults
  exit      Exit from dialer configuration mode
  help      Description of the interactive help system
  no        Negate a command or set its defaults
  number    Enter number in dnis group
```

In the following example, a customer profile called `isp_1` is created, a DNIS group called `dnis_isp_1` is associated with the customer profile, and DNIS numbers 1234 and 5678 are assigned to the DNIS group. Only DNIS numbers 1234 and 5678 are allocated physical resources by the `isp_1` customer profile, which counts and manages the resources for these two DNIS numbers and ignores all other DNIS numbers:

```
resource-pool profile customer isp_1
dnis group dnis_isp_1
exit
dialer dnis group dnis_isp_1
number 1234
number 5678
```

Related Commands

Command	Description
dnis group	Includes a group of DNIS numbers in a customer profile.
resource-pool profile	Creates a resource group for RPM.

dialer dns

To obtain a user profile name on a remote network using reverse Domain Name System (DNS), use the **dialer dns** command in interface configuration mode. To disable this function, use the **no** form of this command.

dialer dns

no dialer dns

Syntax Description

This command has no arguments or keywords.

Defaults

The reverse DNS function is disabled by default.

Command Modes

Interface configuration of a dialer rotary group leader

Command History

Release	Modification
12.0(3)T	This command was introduced.

Usage Guidelines

This command allows the dialer to use reverse DNS to get a profile name for accessing the authentication, authorization, and accounting (AAA) server. This command is not required when using named static routes.

Examples

The following example shows how to allow the dialer to use reverse DNS for name lookup:

```
interface dialer 0
dialer aaa
dialer dns
```

Related Commands

Command	Description
dialer aaa	Allows a dialer to access the AAA server for dialing information.

dialer dtr

To enable dial-on-demand routing (DDR) on an interface and specify that the serial line is connected by non-V.25*bis* modems using Electronic Industries Association (EIA) signalling only—specifically, the data terminal ready (DTR) signal—use the **dialer dtr** command in interface configuration mode. To disable DDR for the interface, use the **no** form of this command.

dialer dtr

no dialer dtr

Syntax Description This command has no arguments or keywords.

Defaults DTR dialing is disabled.

Command Modes Interface configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines A serial interface configured for DTR dialing can place calls only; it cannot accept them. When a local interface is configured for DTR dialing, the remote interface (that will be receiving the calls) can be configured for in-band dialing or not configured for anything but encapsulation, depending on the desired behavior. If the remote interface is expected to terminate a call when no traffic is transmitted for some time, it must be configured for in-band dialing (along with access lists and a dummy dialer string). If the remote interface is purely passive, no configuration is necessary.

Rotary groups cannot be configured for DTR dialing.

The **dialer map** and **dialer string** commands have no effect on DTR dialers.

Examples The following example enables DDR and specifies DTR dialing on an interface:

```
dialer dtr
```

Related Commands	Command	Description
	dialer in-band	Specifies that DDR is to be supported.
	dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	dialer string (legacy DDR)	Specifies the destination string (telephone number) to be called for interfaces calling a single site.

dialer enable-timeout

To set the length of time an interface stays down after a call has completed or failed and before it is available to dial again, use the **dialer enable-timeout** command in interface configuration mode. To return to the default value, use the **no** form of this command.

dialer enable-timeout *seconds*

no dialer enable-timeout

Syntax Description

<i>seconds</i>	Time in seconds that the Cisco IOS software waits before the next call can occur on the specific interface. Acceptable values are positive, nonzero integers in the range from 1 through 2147483. This value must be greater than the serial pulse interval for this interface, set via the pulse-time command.
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Defaults

15 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The **dialer enable-timeout** command can be configured as a line down timer, to keep serial asynchronous or synchronous interface lines down for a certain period of time, and as a callback timer for both serial interfaces and ISDN interfaces.

If your phone lines are often busy or down, you may need to enforce a certain period of time before the system repeats an attempt to make a connection with a remote site. Configuring this timeout can prevent outgoing lines and switching equipment from being needlessly overloaded. In this application, the **dialer enable-timeout** command applies to both inbound and outbound calls on serial interfaces only (not to calls on ISDN interfaces).

When the **dialer enable-timeout** command is configured on an ISDN interface, its only effect is to set a callback timer. ISDN interfaces are not held down after a call has failed or completed because these interfaces support several possible calls at a time.

Examples

The following example shows how to specify a timeout period of 30 seconds on asynchronous interface 1 before attempting another connection:

```
interface async 1
 dialer enable-timeout 30
```

The following example shows how to configure a BRI interface for legacy dial-on-demand routing (DDR) and ISDN caller ID callback:

```
interface bri 0
  description Connected to NTT 81012345678901
  ip address 10.1.1.7 255.255.255.0
  no ip mroute-cache
  encapsulation ppp
  isdn caller 81012345678902 callback
  dialer enable-timeout 2
  dialer map ip 10.1.1.8 name spanky 81012345678902
  dialer-group 1
  ppp authentication chap
```

The following examples show how to configure a PPP callback server and client.

PPP Callback Server

The PPP callback server is configured on an ISDN BRI interface and requires an enable timeout period and a map class to be defined.

```
interface bri 0
  ip address 10.1.1.7 255.255.255.0
  encapsulation ppp
  dialer callback-secure
  dialer enable-timeout 2
  dialer map ip 10.1.1.8 name atlanta class dial1 81012345678901
  dialer-group 1
  ppp callback accept
  ppp authentication chap
```

PPP Callback Client

The PPP callback client is also configured on an ISDN BRI interface, but does not require an enable timeout period or a map class to be defined.

```
map-class dialer dial1
dialer callback-server username
interface bri 0
  ip address 10.1.1.8 255.255.255.0
  encapsulation ppp
  dialer map ip 10.1.1.7 name dallas 81012345678902
  dialer-group 1
  ppp callback request
  ppp authentication chap
```

dialer fast-idle (interface)

To specify the amount of time that a line for which there is contention will stay idle before it is disconnected and the competing call is placed, use the **dialer fast-idle** command in interface configuration mode. To return to the default value, use the **no** form of this command.

dialer fast-idle *seconds*

no dialer fast-idle

Syntax Description

seconds Idle time, in seconds, that must occur on an interface before the line is disconnected. Acceptable values are positive, nonzero integers.

Defaults

20 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The dialer fast idle timer is activated if there is contention for a line. The dialer fast idle timer is activated if a line is busy, a packet for a different next hop address is received, and the busy line is required to send the competing packet.

If the line becomes idle for configured length of time, the current call is disconnected immediately and the new call is placed.

If the line has not yet been idle as long as the fast idle timeout period, the packet is dropped because there is no way to get through to the destination. After the packet is dropped, the fast idle timer remains active and the current call is disconnected as soon as it has been idle for as long as the fast idle timeout.

The fast idle timer will be restarted if, in the meanwhile, another packet is transmitted to the currently connected destination and it is classified as *interesting*.

This command applies to inbound and outbound calls.

Combining this command with the **dialer idle-timeout** command allows you to configure lines to stay up for a longer period of time when there is no contention, but to be reused more quickly when there are not enough lines for the current demand.

Examples

The following example specifies a fast idle timeout of 35 seconds on asynchronous interface 1:

```
interface async 1
 dialer fast-idle 35
```

Related Commands

Command	Description
dialer idle-timeout (interface)	Specifies the idle time before the line is disconnected.
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.

dialer fast-idle (map-class)

To specify the fast idle timer value to use when placing a call to any telephone number associated with a specified class, use the **dialer fast-idle** command in map-class dialer configuration mode. To reset the dialer fast-idle timer to the default, use the **no** form of this command.

dialer fast-idle *seconds*

no dialer fast-idle

Syntax Description

<i>seconds</i>	Number of seconds to wait before placing a different call.
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Defaults

Defaults to the fast idle timer value that is set for the interface.

Command Modes

Map-class dialer configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This fast idle timer is associated only with the map class, not the entire interface.

Examples

The following example specifies a dialer fast idle time of 10 seconds:

```
dialer string 4156884540 class Eng

! This map-class ensures that these calls use an ISDN speed of 56 kbps and a
! fast-idle time of 10 seconds.
map-class dialer Eng
  isdn speed 56
  dialer fast-idle 10
  dialer wait-for-carrier-time 30
```

Related Commands

Command	Description
dialer idle-timeout (interface)	Specifies the amount of time that a line for which there is contention will stay idle before it is disconnected and the competing call is placed.
dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.

dialer-group

To control access by configuring an interface to belong to a specific dialing group, use the **dialer-group** command in interface configuration mode. To remove an interface from the specified dialer access group, use the **no** form of this command.

dialer-group *group-number*

no dialer-group

Syntax Description

<i>group-number</i>	Number of the dialer access group to which the specific interface belongs. This access group is defined with the dialer-list command. Acceptable values are nonzero, positive integers between 1 and 10.
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Defaults

No access is predefined.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

An interface can be associated with a single dialer access group only; multiple **dialer-group** assignment is not allowed. A second dialer access group assignment will override the first. A dialer access group is defined with the **dialer-group** command. The **dialer-list** command associates an access list with a dialer access group.

Packets that match the dialer group specified trigger a connection request.

Examples

The following example specifies dialer access group number 1.

The destination address of the packet is evaluated against the access list specified in the associated **dialer-list** command. If it passes, either a call is initiated (if no connection has already been established) or the idle timer is reset (if a call is currently connected).

```
interface async 1
  dialer-group 1
access-list 101 deny igrp 0.0.0.0 255.255.255.255 255.255.255.255 0.0.0.0
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
dialer-list 1 protocol ip list 101
```

Related Commands

Command	Description
dialer-list protocol	Defines a DDR dialer list to control dialing by protocol or by a combination of protocol and an access list.

dialer hold-queue

To allow *interesting* outgoing packets to be queued until a modem connection is established, use the **dialer hold-queue** command in interface configuration mode. To disable the hold queue, use the **no** form of this command.

dialer hold-queue *packets* **timeout** *seconds*

no dialer hold-queue [*packets*]

Syntax Description

<i>packets</i>	Number of packets, in the range 1 to 100 packets, to hold in the queue. This argument is optional with the no form of this command.
timeout <i>seconds</i>	Amount of time, in seconds, to queue the packets.

Defaults

The outgoing packet queue is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

A dialer hold queue can be configured on any type of dialer, including in-band synchronous, asynchronous, data terminal ready (DTR), and ISDN dialers. Rotary groups can be configured with a dialer hold queue. If a rotary group is configured with a hold queue, all members of the group will be configured with a dialer hold queue and no individual member's hold queue can be altered.

If no hold queue is configured, packets are dropped during the time required to establish a connection. Setting *packets* to 0 using the **dialer hold-queue** command is equivalent to using the **no dialer hold-queue** command.

Examples

The following command configures a dialer hold queue to hold 10 packets:

```
dialer hold-queue 10 timeout 60
```

Related Commands

Command	Description
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.

dialer idle-timeout (interface)

To specify the duration of idle time before a line is disconnected, use the **dialer idle-timeout** command in interface configuration mode. To reset the idle timeout to the default, use the **no** form of this command.

dialer idle-timeout *seconds* [**inbound** | **either**]

no dialer idle-timeout

Syntax Description

<i>seconds</i>	Idle time, in seconds, that must occur on the interface before the line is disconnected. Acceptable values are positive, nonzero integers.
inbound	(Optional) Only inbound traffic will reset the idle timeout.
either	(Optional) Both inbound and outbound traffic will reset the idle timeout.

Defaults

Direction: outbound
Idle time: 120 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.1(1)T	The following keywords were added: <ul style="list-style-type: none"> • inbound • either

Usage Guidelines

This command is used on lines for which there is no contention. When contention occurs, the **dialer fast-idle** command is activated. For example, when a busy line is requested to send another packet to a different destination than it is currently connected to, line contention occurs and the **dialer fast-idle** command is activated.

By default, this command applies to inbound and outbound calls. For example, if a receiving system needs to make outgoing calls, you might configure it with a short idle timeout.

Only packets that match the dialer group reset the idle timer.

Use the **dialer idle-timeout** command to set a very high idle timer when Multilink PPP is configured and you want a multilink bundle to be connected indefinitely. (The **dialer-load threshold 1** command no longer keeps a multilink bundle of n links connected indefinitely and the **dialer-load threshold** command no longer keeps a multilink bundle of two links connected indefinitely.)

dialer idle-timeout (interface)**Examples**

The following example specifies an idle timeout of 3 minutes (180 seconds) on asynchronous interface 1. Because the **inbound** keyword is included, only inbound traffic that matches the dialer group will reset the idle timer.

```
interface async 1
 dialer idle-timeout 180 inbound
```

Related Commands

Command	Description
dialer fast-idle (interface)	Specifies the amount of time that a line for which there is contention will stay idle before it is disconnected and the competing call is placed.
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.

dialer in-band

To specify that dial-on-demand routing (DDR) is to be supported, use the **dialer in-band** command in interface configuration mode. To disable DDR for the interface, use the **no** form of this command.

dialer in-band [**no-parity** | **odd-parity**]

no dialer in-band

Syntax Description

no-parity	(Optional) No parity is to be applied to the dialer string that is sent out to the modem on synchronous interfaces.
odd-parity	(Optional) Dialed number has odd parity (7-bit ASCII characters with the eighth bit as the parity bit) on synchronous interfaces.

Defaults

Disabled. By default, no parity is applied to the dialer string.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The **dialer in-band** command specifies that chat scripts will be used on asynchronous interfaces and V.25bis will be used on synchronous interfaces. The parity keywords do not apply to asynchronous interfaces. The parity setting applies to the dialer string that is sent out to the modem. If you do not specify a parity, or if you specify no parity, no parity is applied to the output number. If odd parity is configured, the dialed number will have odd parity (7-bit ASCII characters with the eighth bit as the parity bit.) If an interface only accepts calls and does not place calls, the **dialer in-band** interface configuration command is the only command needed to configure it. If an interface is configured in this manner, with no dialer rotary groups, the idle timer never disconnects the line. It is up to the remote end (the end that placed the call) to disconnect the line based on idle time.

Examples

The following example specifies DDR for asynchronous interface 1:

```
interface async 1
dialer in-band
```

Related Commands

Command	Description
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
dialer string (legacy DDR)	Specifies the string (telephone number) to be called for interfaces calling a single site.

dialer isdn

To specify the bit rate used on the B channel associated with a specified map class and to specify whether to set up semipermanent connections for this map class, use the **dialer isdn** command in map-class dialer configuration mode. To remove the speed and connection settings, use the **no** form of this command.

dialer isdn [*speed speed*] [*spc*]

no dialer isdn [*speed speed*] [*spc*]

Syntax Description

speed <i>speed</i>	(Optional) Bit rate, in kilobytes per second (kbps), used on the ISDN B channel. Values are 56 and 64 . Defaults is 64.
spc	(Optional) ISDN semipermanent connection is used for calls associated with this map class.

Defaults

Bit rate is 64 kbps. Semipermanent connections are not set up.

Command Modes

Map-class dialer configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is valid for ISDN interfaces only.

Examples

The following example configures a speed of 56 kbps and no semipermanent connections for the Eng map class:

```
dialer string 4156884540 class Eng
```

```
! This map-class ensures that these calls use an ISDN speed of 56 kbps and that
! no semipermanent connection is set up.
```

```
map-class dialer Eng
dialer isdn speed 56
```

Related Commands

Command	Description
dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.

dialer isdn short-hold

To configure the router to disconnect a call at the end of the current charging period if the line has been idle for at least the specified minimum period, use the **dialer isdn short-hold** command in map-class dialer configuration mode. To reset the ISDN short-hold timer to the default period, use the **no** form of this command.

dialer isdn short-hold *seconds*

no dialer isdn short-hold

Syntax Description	<i>seconds</i>	Minimum number of seconds of idle time on the line. Default is 120 seconds.
--------------------	----------------	-----------------------------------------------------------------------------

Defaults	Disabled; the router uses a static idle timeout. When this command is enabled, the default short-hold timeout is 120 seconds.
----------	-------------------------------------------------------------------------------------------------------------------------------

Command Modes	Map-class dialer configuration
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Command History	Release	Modification
	11.3	This command was introduced.

Usage Guidelines	<p>This command is used for configuring ISDN Advice of Charge (AOC) on Cisco routers.</p> <p>Use the dialer isdn short-hold command if you subscribe to an ISDN AOC during-call service provided by the local ISDN network and want to use this option. The router uses the frequency at which the network sends the AOC-D message to determine the charging period. If the line has been idle for the short-hold timeout, the call disconnects at the end of the charging period. If the line has not been idle for at least that long, the call is maintained into the next charging period.</p>
------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Examples	<p>The following partial example configures the dialer map class Deutschland with a static idle timeout for outgoing calls. The static idle timer is to be used if for any reason the network does not provide charging information. It also configures a short-hold timeout to allow the router to determine dynamically whether to disconnect or continue the call at the end of the charging period.</p>
----------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

```
dialer map-class Deutschland
dialer idle-timeout 150
dialer isdn short-hold 120
```

Related Commands	Command	Description
	dialer map	Configures a serial interface or ISDN interface to call one or multiple sites, or to receive calls from multiple sites.
	dialer string (dialer profiles)	Specifies the string (telephone number) to be used when placing a call from an interface.
	dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
	map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.

dialer-list protocol

To define a dial-on-demand routing (DDR) dialer list for dialing by protocol or by a combination of a protocol and a previously defined access list, use the **dialer-list protocol** command in global configuration mode. To delete a dialer list, use the **no** form of this command.

```
dialer-list dialer-group protocol protocol-name { permit | deny | list access-list-number | access-group }
```

```
no dialer-list dialer-group [protocol protocol-name [list access-list-number | access-group ]]
```

Syntax Description		
<i>dialer-group</i>	Number of a dialer access group identified in any dialer-group interface configuration command.	
<i>protocol-name</i>	One of the following protocol keywords: appletalk , bridge , clns , clns_es , clns_is , decnet , decnet_router-L1 , decnet_router-L2 , decnet_node , ip , ipx , vines , or xns .	
permit	Permits access to an entire protocol.	
deny	Denies access to an entire protocol.	
list	Specifies that an access list will be used for defining a granularity finer than an entire protocol.	
<i>access-list-number</i>	Access list numbers specified in any DECnet, Banyan VINES, IP, Novell IPX, or XNS standard or extended access lists, including Novell IPX extended service access point (SAP) access lists and bridging types. See Table 7 for the supported access list types and numbers.	
<i>access-group</i>	Filter list name used in the clns filter-set and clns access-group commands.	

Defaults No dialer lists are defined.

Command Modes Global configuration

Command History	Release	Modification
	10.0	This command was introduced.
	10.3	The following keyword and arguments were added: <ul style="list-style-type: none"> list <i>access-list-number</i> and <i>access-group</i>

Usage Guidelines

The various **no** forms of this command have the following effects:

- The **no dialer-list 1** command deletes all lists configured with list 1, regardless of the keyword previously used (**permit**, **deny**, **protocol**, or **list**).
- The **no dialer-list 1 protocol protocol-name** command deletes all lists configured with list 1 and **protocol protocol-name**.
- The **no dialer-list 1 protocol protocol-name list access-list-number** command deletes the specified list.

The **dialer-list protocol** form of this command permits or denies access to an entire protocol. The **dialer-list protocol list** form of this command provides a finer permission granularity and also supports protocols that were not previously supported.

The **dialer-list protocol list** form of this command applies protocol access lists to dialer access groups to control dialing using DDR. The dialer access groups are defined with the **dialer-group** command.

[Table 7](#) lists the access list types and numbers that the **dialer-list protocol list** command supports. The table does not include ISO CLNS because that protocol uses filter names instead of predefined access list numbers.

Table 7 *dialer-list Command Supported Access List Types and Numbers*

Access List Type	Access List Number Range (Decimal)
AppleTalk	600–699
Banyan VINES (standard)	1–100
Banyan VINES (extended)	101–200
DECnet	300–399
IP (standard)	1–99
IP (extended)	100–199
Novell IPX (standard)	800–899
Novell IPX (extended)	900–999
Transparent Bridging	200–299
XNS	500–599

Examples

Dialing occurs when an interesting packet (one that matches access list specifications) needs to be output on an interface. Using the standard access list method, packets can be classified as interesting or uninteresting. In the following example, IGRP TCP/IP routing protocol updates are not classified as interesting and do not initiate calls:

```
access-list 101 deny igmp 0.0.0.0 255.255.255.255 255.255.255.255 0.0.0.0
```

The following example classifies all other IP packets as interesting and permits them to initiate calls:

```
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
```

Then the following command places list 101 into dialer access group 1:

```
dialer-list 1 protocol ip list 101
```

In the following example, DECnet access lists allow any DECnet packets with source area 10 and destination area 20 to trigger calls:

```
access-list 301 permit 10.0 0.1023 10.0 0.1023
access-list 301 permit 10.0 0.1023 20.0 0.1023
```

Then the following command places access list 301 into dialer access group 1:

```
dialer-list 1 protocol decnet list 301
```

In the following example, both IP and VINES access lists are defined. The IP access lists define IGRP packets as uninteresting, but permits all other IP packets to trigger calls. The VINES access lists do not allow Routing Table Protocol (RTP) routing updates to trigger calls, but allow any other data packets to trigger calls.

```
access-list 101 deny igmp 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
access-list 101 permit ip 0.0.0.0 255.255.255.255 0.0.0.0 255.255.255.255
!
vines access-list 107 deny RTP 00000000:0000 FFFFFFFF:FFFF 00000000:0000 FFFFFFFF:FFFF
vines access-list 107 permit IP 00000000:0000 FFFFFFFF:FFFF 00000000:0000 FFFFFFFF:FFFF
```

Then the following two commands place the IP and VINES access lists into dialer access group 1:

```
dialer-list 1 protocol ip list 101
dialer-list 1 protocol vines list 107
```

In the following example, a Connectionless Network Service (CLNS) filter is defined and then the filter is placed in dialer access group 1:

```
clns filter-set ddrline permit 47.0004.0001....
!
dialer-list 1 protocol clns list ddrline
```

Related Commands

Command	Description
access-list	Configures the access list mechanism for filtering frames by protocol type or vendor code.
clns filter-set	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.
vines access-list	Creates a VINES access list.

dialer load-threshold

To configure bandwidth on demand by setting the maximum load before the dialer places another call to a destination, use the **dialer load-threshold** command in interface configuration mode. To disable the setting, use the **no** form of this command.

dialer load-threshold *load* [**outbound** | **inbound** | **either**]

no dialer load-threshold

Syntax Description

<i>load</i>	Interface load used to determine whether to initiate another call or to drop a link to the destination. This argument represents a utilization percentage; it is a number between 1 and 255, where 255 is 100 percent.
outbound	(Optional) Calculates the actual load using outbound data only.
inbound	(Optional) Calculates the actual load using inbound data only.
either	(Optional) Sets the maximum calculated load as the larger of the outbound and inbound loads.

Defaults

No maximum load is predefined.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

When the cumulative load of all UP links (a number n) exceeds the load threshold the dialer adds an extra link and when the cumulative load of all UP links minus one ($n - 1$) is at or below load threshold then the dialer can bring down that one link. The dialer will make additional calls or drop links as necessary but will never interrupt an existing call to another destination.

The *load* argument is the calculated weighted average load value for the interface; 1 is unloaded and 255 is fully loaded. The load is calculated by the system dynamically, based on bandwidth. You can set the bandwidth for an interface in kilobits per second, using the **bandwidth** command.

The load calculation determines how much of the total bandwidth you are using. A *load* value of 255 means that you are using one hundred percent of the bandwidth. The load number is required.

See the description of the **bandwidth** command earlier in this guide for more information.

When multilink PPP is configured, the **dialer load-threshold 1** command no longer keeps a multilink bundle of n links connected indefinitely and the **dialer-load threshold 2** command no longer keeps a multilink bundle of 2 links connected indefinitely. If you want a multilink bundle to be connected indefinitely, you must set a high idle timer or make all traffic interesting.

When two connected routers are configured to dial out, only one router should have the **dialer max-call** or **dialer pool-member max-links** command configured. Otherwise, if both routers dial simultaneously, each will reject the incoming call when it exceeds the setting for the **max-links** argument. If the

maximum number of calls configured is one and dialing out is synchronized, no connection will come up or it will take many retries before the connection stays up. To prevent this problem, one of the following configurations is recommended:

- Use the **dialer max-call** command to restrict the number of connections, rather than the **dialer pool-member max-links** command. The result is the same and the **dialer max-call** command is easier to understand and configure.
- When two systems will dial each other and a maximum of one link is desired, configure the **dialer max-calls** command on only one side of the connection, not on both sides.
- Configure the **dialer load-threshold** command on only one side of the connection, either the local or remote router, and configure the **dialer max-call** command on the interface where the **dialer load-threshold** command is configured.



Note

Dial-on-demand (DDR) load balancing does not forward packets correctly when the system dials out via the **dialer load-threshold** command and more than one remote device is connected by either dial-out or dial-in. This problem typically occurs on a PRI with **dialer load-threshold** configured, but it may also occur on BRI or multiple DDR interfaces in a dialer rotary group when more than one remote device is connected. As a workaround, remove the **dialer load-threshold** command.

Examples

In the following example, if the load to a particular destination on an interface in dialer rotary group 5 exceeds interface load 200, the dialer will initiate another call to the destination:

```
interface dialer 5
 dialer load-threshold 200
```

Related Commands

Command	Description
bandwidth	Specifies the maximum aggregate bandwidth for H.323 traffic.
busyout	Creates a “host-failed” message that displays when a connection fails.
dialer max-call	Specifies the maximum number of calls to a remote destination that can be up at any one time for a dialer profile.
dialer pool-member max-links	Configures a physical interface to be a member of a dialer profile dialing pool.
dialer reserved-links	Includes a specified interface in a dialer rotary group.
interface dialer	Defines a dialer rotary group.

dialer map

To configure a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites, use a form of the **dialer map** command in interface configuration mode; all options are shown in the first form of this command. To delete a particular dialer map entry, use the **no** form of this command.

```
dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64] [broadcast]
[modem-script modem-regexp] [system-script system-regexp] [dial-string[:isdn-subaddress]]
```

```
no dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64]
[broadcast] [modem-script modem-regexp] [system-script system-regexp]
[dial-string[:isdn-subaddress]]
```

To configure a serial interface or ISDN interface to place a call to multiple sites and to authenticate calls from multiple sites, use the second form of the **dialer map** command:

```
dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64] [broadcast]
[dial-string[:isdn-subaddress]]
```

```
no dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64]
[broadcast] [dial-string[:isdn-subaddress]]
```

To configure a serial interface or ISDN interface to support bridging, use the third form of this command:

```
dialer map bridge [name host-name] [spc] [broadcast] [dial-string[:isdn-subaddress]]
```

```
no dialer map bridge [name host-name] [spc] [broadcast] [dial-string[:isdn-subaddress]]
```

To configure an asynchronous interface to place a call to a single site that requires a system script or that has no assigned modem script, or to multiple sites on a single line, on multiple lines, or on a dialer rotary group, use the fourth form of the **dialer map** command:

```
dialer map protocol next-hop-address [name host-name] [broadcast] [modem-script
modem-regexp] [system-script system-regexp] [dial-string]
```

```
no dialer map protocol next-hop-address [name host-name] [broadcast] [modem-script
modem-regexp] [system-script system-regexp] [dial-string]
```

Syntax Description

<i>protocol</i>	Protocol keywords; one of the following: appletalk , bridge , clns , decnet , ip , ipx , novell , snapshot , vines , and xns .
<i>next-hop-address</i>	Protocol address used to match against addresses to which packets are destined. This argument is not used with the bridge protocol keyword.
name	(Optional) The remote system with which the local router or access server communicates. Used for authenticating the remote system on incoming calls.
<i>host-name</i>	(Optional) Case-sensitive name or ID of the remote device (usually the host name). For routers with ISDN interfaces, if calling line identification—sometimes called CLI, but also known as caller ID and automatic number identification (ANI)—is provided, the <i>host-name</i> field can contain the number that the calling line ID provides.

spc	(Optional) Semipermanent connection between customer equipment and the exchange; used only in Germany for circuits between an ISDN BRI and a 1TR6 ISDN switch and in Australia for circuits between an ISDN PRI and a TS-014 switch.
speed 56 speed 64	(Optional) Keyword and value indicating the line speed in kilobits per second to use. Used for ISDN only. The default speed is speed 64 (64 kbps).
broadcast	(Optional) Broadcasts should be forwarded to this protocol address.
modem-script	(Optional) A modem script is used for the connection (for asynchronous interfaces).
<i>modem-regexp</i>	(Optional) Regular expression to which a modem script will be matched (for asynchronous interfaces).
system-script	(Optional) A system script is used for the connection (for asynchronous interfaces).
<i>system-regexp</i>	(Optional) Regular expression to which a system script will be matched (for asynchronous interfaces).
<i>dial-string[:isdn-subaddress]</i>	(Optional) Telephone number sent to the dialing device when it recognizes packets with the specified next hop address that matches the access lists defined, and the optional subaddress number used for ISDN multipoint connections. The dial string and ISDN subaddress, if used, must be the last item in the command line.

Defaults

No dialer map is configured. The default speed is 64 kbps. No scripts are defined for placing calls.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines**Usage Guidelines for Synchronous Interfaces**

Use the **dialer map** command with the **name** keyword but without the dial-string in configurations in which remote sites are calling a central site, but the central site is not calling the remote site. With this command, the local device will authenticate the remote site using Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP), which will transmit the remote site's host name to the central site. The central site will then use this name to authenticate the caller, and will use the next hop address to transmit packets to the remote site. Because there is no dialer string specified, the central site cannot call the remote router.

Usage Guidelines for ISDN Interfaces

Use the **dialer map** command with the **name** keyword in configurations in which remote sites are calling a central site, but the central site is not calling the remote site. With this command, the local device will authenticate the remote site using CHAP or PAP, which will transmit the remote site's host name to the

central site. The central site will then use this name to authenticate the caller, and will use the next hop address to transmit packets to the remote site. Because there is no dialer string specified, the central site cannot call the remote router.

For ISDN interfaces only, you can specify an optional speed parameter for **dialer map** commands if you also specify a dial string. This option informs the ISDN software whether it should place a call at 56 or 64 kbps. If you omit the ISDN speed parameter, the default is 64 kbps.

For routers with ISDN interfaces, if calling line identification (CLI)—also known as *caller ID* and *ANI*—is provided, the *host-name* field may contain the number that calling line ID provides.

Usage Guidelines for Asynchronous Interfaces

Specify chat scripts for a physical interface that is not part of a dialer rotary group if no chat script is specified for the line, or if an additional (system) chat script is required to log on to the remote system.

Configure a **dialer map** command for each remote destination for that interface.

You do not need to specify a system script under the following conditions:

- The modem script can be used to dial in and log on to the remote system.
- You are calling a system that does not require a login script—that is, a system that answers and immediately goes into protocol mode.

If you adhere to the chat script naming convention suggested in the description of the **chat-script** command, use the form [**modem-script** **modulation-type*] in the **dialer map** command; for example, **-v32bis*. This form allows you to specify the modulation type that is best for the system you are calling, and allows the modem type for the line to be specified by the **script dialer** command.

The period (.) is a wildcard that matches any character, and the asterisk (*) indicates that the preceding character can be duplicated multiple times. For more information about regular expressions, see the “Regular Expressions” appendix in this manual.

If a modem script is specified in the **dialer map** interface configuration command and a modem script specified in the **script dialer** line configuration command, the first chat script that matches both is used. If no script matches both, an error message is logged and the connection is not established. If there is no modem chat script specified for the line, the first chat script (that is, the one specified in the **chat-script** global configuration command) that matches the modem script’s regular expression is used. If there is a system script specified in the **dialer map** interface configuration command, the first chat script to match the regular expression is used.

The **modem-script** and **system-script** keywords and corresponding arguments are optional. They are ignored on synchronous interfaces.

If you have named your chat script according to the type of modem and modulation (for example, *codex-v32* or *telebit v32*), your regular expression could be **codex-.*** in the **script dialer** line configuration command, and ***-v32bis** in the modem script specified in the **dialer map** command for a system that you wish to connect to using V.32bis modulation.

The modem lines (specified by the argument *regex* in the **script dialer** line configuration command) would be set to one of the following regular expressions to match patterns, depending on the kind of modem you have:

- **codex-.***
- **telebit-.***
- **usr-.***

With an interface configured for Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP) and configured with the **name** *host-name* keyword and argument pair, the local device authenticates the remote site using CHAP, which transmits the remote site’s host name to

the central site. The central site then uses this name to authenticate the caller and uses the next hop address to transmit packets to the remote site. Because no dialer string is specified, the central site cannot call the remote router.

For routers with ISDN interfaces, if calling line identification CLI—also known as *caller ID* and *ANI*—is provided, the *host-name* field can contain the number that calling line ID provides.

Examples

The following example sets the dialer speed at 56 kbps to call a remote site at 172.19.2.5:

```
interface async 1
encapsulation ppp
ppp authentication chap
dialer map ip 172.19.2.5 speed 56
```

The following example shows a dialing chat script and a login chat script. The **dialer in-band** command enables DDR on asynchronous interface 10, and the **dialer map** command looks for the specified dialing and the login scripts and then uses those scripts to dial 95557890.

```
chat-script dial ABORT ERROR "" "AT Z" OK "ATDT \T" TIMEOUT 30 CONNECT \c
chat-script login ABORT invalid TIMEOUT 15 name: billw word: wewpass ">" "slip default"
interface async 10
dialer in-band
dialer map ip 10.55.0.1 modem-script dial system-script login 95557890
```

The following example, the remote site is calling the central site, and the central site is calling the remote site. The central router can use the name *ZZZ* to authenticate the remote router when they connect and also can use the dialer string 1415553434 to call the remote router if it is not currently connected.

```
interface async 1
dialer map ip 172.19.2.5 name ZZZ 1415553434
```

In the following example, a remote site is calling a central site, but the central site is not calling the remote site. The local device will authenticate the site that is calling in using CHAP. CHAP will cause the remote site's name, *YYY*, to be transmitted to the site it is calling. The central site will then use this name to authenticate the remote site.

```
interface async 1
encapsulation ppp
ppp authentication chap
dialer map ip 172.19.2.5 name YYY
```

Related Commands

Command	Description
chat-script	Places calls over a modem and logs in to remote systems.
ppp bap call	Sets PPP BACP call parameters.
virtual-profile aaa	Enables virtual profiles by AAA configuration.

dialer map (AOC)

To configure an ISDN interface to place a call to multiple sites, to authenticate calls from multiple sites, and to identify the class name that configures the ISDN Advice of Charge (AOC) short-hold idle timeout, use the following form of the **dialer map** command in interface configuration mode. To delete a particular dialer map entry, use the **no** form of this command.

```
dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64] [broadcast]
class class-name [dial-string[:isdn-subaddress]]
```

```
no dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64]
[broadcast] class class-name [dial-string[:isdn-subaddress]]
```

Syntax Description	
<i>protocol</i>	Protocol keywords; one of the following: appletalk , bridge , clns , decnet , ip , ipx , novell , snapshot , vines , and xns .
<i>next-hop-address</i>	Protocol address used to match against addresses to which packets are destined. This argument is not used with the bridge protocol keyword.
name <i>host-name</i>	(Optional) Case-sensitive name or ID of the remote device (usually the host name). For routers with ISDN interfaces, if calling line identification—sometimes called <i>CLI</i> , but also known as <i>caller ID</i> and <i>automatic number identification</i> (ANI)—is provided, the <i>host-name</i> field can contain the number that the calling line ID provides.
spc	(Optional) Semipermanent connection between customer equipment and the exchange; used only in Germany to configure connections between an ISDN BRI and a 1TR6 ISDN switch type.
speed 56 speed 64	(Optional) Line speed in kilobits per second to use. Used for ISDN only. The default is speed 64 (64 kbps).
broadcast	(Optional) Broadcasts should be forwarded to this protocol address.
class <i>class-name</i>	Name of the class that configures the ISDN AOC static dialer timeout period or the short-hold timeout period or both.
<i>dial-string[:isdn-subaddress]</i>	(Optional) Telephone number and optional ISDN subaddress used for ISDN multipoint connections that are sent to the dialing device when it recognizes packets with the specified next hop address that matches the access lists defined. The dial string and ISDN subaddress, if used, must be the last item in the command line.

Defaults No dialer map is configured. The default speed is 64 kbps. No default class name is provided.

Command Modes Interface configuration

Command History

Release	Modification
9.1	This command was introduced.
11.3	This command was introduced for ISDN Advice of Charge (AOC).

Usage Guidelines

This form of the **dialer map** command is used for configuring ISDN Advice of Charge (AOC) on Cisco routers.

For ISDN interfaces, use the **dialer map** command with the **name** keyword in configurations in which remote sites are calling a central site, but the central site is not calling the remote site. With this command, the local device will authenticate the remote site using CHAP or PAP, which will transmit the remote site's host name to the central site. The central site will then use this name to authenticate the caller, and will use the next hop address to transmit packets to the remote site. Because there is no dialer string specified, the central site cannot call the remote router.

For ISDN interfaces only, you can specify an optional speed parameter for **dialer map** commands if you also specify a dial string. This option informs the ISDN software whether it should place a call at 56 or 64 kbps. If you omit the ISDN speed parameter, the default is 64 kbps.

For routers with ISDN interfaces, if calling line identification (CLI)—also known as *caller ID* and *ANI*—is provided, the *host-name* field may contain the number that calling line ID provides.

Use the **dialer map** command with the **class** keyword for outgoing calls when the network provides ISDN Advice of Charge (AOC) information. Use the **map-class dialer** global command to identify the class name, the **dialer fast-idle** map-class command to define a fast idle timeout period for outgoing calls to the class, and the **dialer isdn short-hold** map-class command to define the minimum idle time to wait before disconnecting calls at the end of the charging period.

Examples

In the following legacy DDR example, a BRI interface is configured with dialer map classes to use for outgoing calls and a dialer idle timeout period to use for all incoming calls. All of the map classes are configured with dialer idle timeout periods that override the interface static dialer idle timeout for outgoing calls. Two map classes are also configured for an ISDN AOC short-hold idle timeout.

```
hostname A
!
username c2503isdn password 7 1511021F0725
username B password 7 110A1016141D29
username C password 7 1511021F072508
isdn switch-type basic-net3
!
interface bri 0
 ip address 10.0.0.35 255.0.0.0
 encapsulation ppp
 dialer idle-timeout 150
 dialer map ip 10.0.0.33 name c2503isdn class Iota 06966600050
 dialer map ip 10.0.0.40 name B class Beta 778578
 dialer map ip 10.0.0.45 name C class Kappa 778579
 ppp authentication chap
!
map-class dialer Kappa
 dialer idle-timeout 300
 dialer isdn short-hold 10
!
map-class dialer Iota
 dialer idle-timeout 300
!
```

■ dialer map (AOC)

```
map-class dialer Beta
dialer idle-timeout 300
dialer isdn short-hold 10
```

Related Commands

Command	Description
dialer isdn short-hold	Configures the router to disconnect a call at the end of the current charging period if the line has been idle for at least the specified minimum period.
map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.
ppp bap call	Sets PPP BACP call parameters.
virtual-profile aaa	Enables virtual profiles by AAA configuration.

dialer map (SPC)

To set up network addressing on an ISDN BRI interface to support semipermanent connections (if the ISDN switch supports such connections), use the following form of the **dialer map** command in interface configuration mode. To delete a particular dialer map entry, use the **no** form of this command.

```
dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64] [broadcast]
dial-string[:isdn-subaddress]
```

```
no dialer map protocol next-hop-address [name host-name] [spc] [speed 56 | speed 64]
[broadcast] dial-string[:isdn-subaddress]
```

Syntax Description		
<i>protocol</i>		Protocol keywords; one of the following: appletalk , bridge , clns , decnet , ip , ipx , novell , snapshot , vines , and xns .
<i>next-hop-address</i>		Protocol address used to match against addresses to which packets are destined. This argument is not used with the bridge protocol keyword.
name <i>host-name</i>		(Optional) Case-sensitive name or ID of the remote device (usually the host name). For routers with ISDN interfaces, if calling line identification—sometimes called <i>CLI</i> , but also known as <i>caller ID</i> and <i>automatic number identification</i> (ANI)—is provided, the <i>host-name</i> field can contain the number that the calling line ID provides.
spc		(Optional) Semipermanent connection between customer equipment and the exchange; used only in Germany to configure connections between an ISDN BRI and a 1TR6 ISDN switch type.
speed 56 speed 64		(Optional) Line speed in kilobits per second to use. Used for ISDN only. The default speed is 64 kbps.
broadcast		(Optional) Broadcasts are forwarded to this protocol address.
<i>dial-string[:isdn-subaddress]</i>		(Optional) Telephone number and optional ISDN subaddress used for ISDN multipoint connections that are sent to the dialing device when it recognizes packets with the specified next hop address that matches the access lists defined. The dial string and ISDN subaddress, if used, must be the last item in the command line.

Defaults No dialer map is configured. The default speed is 64 kbps. No default class name is provided.

Command Modes Interface configuration

Command History	Release	Modification
	9.1	This command was introduced for synchronous serial interfaces using V.25bis dialing.

Usage Guidelines

Typically, this implementation is applicable for BRI in Germany only.

For ISDN interfaces, use the **dialer map** command with the **name** keyword in configurations in which remote sites are calling a central site, but the central site is not calling the remote site. With this command, the local device will authenticate the remote site using CHAP or PAP, which will transmit the remote site's host name to the central site. The central site will then use this name to authenticate the caller, and will use the next hop address to transmit packets to the remote site. If no dialer string specified, the central site cannot call the remote router.

For ISDN interfaces only, you can specify an optional speed parameter for **dialer map** commands if you also specify a dial string. This option informs the ISDN software whether it should place a call at 56 or 64 kbps. If you omit the ISDN speed parameter, the default is 64 kbps.

For routers with ISDN interfaces, if calling line identification (CLI)—also known as *caller ID* and *ANI*—is provided, the *host-name* field may contain the number that calling line ID provides.

Examples

The following example configures the interface for semipermanent connections in Germany; the IP address and the phone number are provided.

```
dialer map ip 192.168.48.2 spc 49305555655:3789
```

Related Commands

Command	Description
dialer isdn short-hold	Configures the router to disconnect a call at the end of the current charging period if the line has been idle for at least the specified minimum period.
map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.
ppp bap call	Sets PPP BACP call parameters.
virtual-profile aaa	Enables virtual profiles by AAA configuration.

dialer map snapshot

To define a dialer map for Cisco's snapshot routing protocol on a client router connected to a dial-on-demand routing (DDR) interface, use the **dialer map snapshot** command in interface configuration mode. To delete one or more previously defined snapshot routing dialer maps, use the **no** form of this command.

dialer map snapshot *sequence-number dial-string*

no dialer map snapshot [*sequence-number*]

Syntax Description

<i>sequence-number</i>	A number in the range from 1 to 254, inclusive, that uniquely identifies a dialer map. (Optional for the no form.)
<i>dial-string</i>	Telephone number of a remote snapshot server to be called during an active period.

Defaults

No snapshot routing dialer map is defined.

Command Modes

Interface configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

Enter a command for each remote snapshot server router the client router should call during an active period.

Use the **no dialer map snapshot** form of this command to remove all previously defined snapshot dialer maps on the client router; use the **no dialer map snapshot** *sequence-number* form of this command to delete a specified dialer map.

Examples

The following examples define snapshot dialer maps on a client router:

```
dialer map snapshot 12 4151231234
dialer map snapshot 13 4151231245
```

The following example removes one of the previously defined snapshot routing dialer maps on the client router:

```
no dialer map snapshot 13
```

Related Commands

Command	Description
dialer reserved-links	Includes a specified interface in a dialer rotary group.
interface dialer	Defines a dialer rotary group.
snapshot client	Configures a client router for snapshot routing.

dialer max-call

To specify the maximum number of calls to a remote destination that can be up at any one time for a dialer profile, use the **dialer max-call** command in interface configuration mode.

dialer max-call *number*

Syntax Description	<i>number</i>	Maximum number of calls, ranging from 1 to 4096.
Defaults	No maximum number of calls is specified.	
Command Modes	Interface configuration	
Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines

The **dialer max-calls** command is used to specify the maximum number of calls for the dialer interface. This command applies to dialer interfaces only.

This command can be configured only if a dialer profile is enabled using the **dialer pool** command. The **dialer max-call** command cannot be used with legacy dial-on-demand routing (DDR).

When two connected routers are configured to dial out, only one router should have the **dialer max-call** or **dialer pool-member max-links** command configured. Otherwise, if both routers dial simultaneously, each will reject the incoming call when it exceeds the setting for the **max-links** argument. If the maximum number of calls configured is one and dialing out is synchronized, no connection will come up or it will take many retries before the connection stays up. To prevent this problem, one of the following configurations is recommended:

- Use the **dialer max-call** command to restrict the number of connections, rather than the **dialer pool-member max-links** command. The result is the same and the **dialer max-call** command is easier to understand and configure.
- When two systems will dial each other and a maximum of one link is desired, configure the **dialer max-calls** command on only one side of the connection, not on both sides.
- Configure the **dialer load-threshold** command on only one side of the connection, either the local or remote router, and configure the **dialer max-call** command on the interface where the **dialer load-threshold** command is configured.

Examples

The following example sets a maximum of six calls:

```
dialer max-call 6
```

Related Commands	Command	Description
	dialer isdn	Specifies the bit rate used on the B channel associated with a specified map class and specifies whether to set up semipermanent connections for this map class.
	dialer load-threshold	Configures bandwidth on demand by setting the maximum load before the dialer places another call to a destination.
	dialer pool	Specifies, for a dialer interface, which dialing pool to use to connect to a specific destination subnetwork.
	dialer pool-member max-links	Configures a physical interface to be a member of a dialer profile dialing pool.
	dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.

dialer outgoing

To configure the dialer map class for a Network Specific Facilities (NSF) dialing plan to support outgoing calls, use the **dialer outgoing** command in map-class dialer configuration mode.

dialer outgoing *class-name*

Syntax Description	<i>class-name</i>	Keyword for a specified AT&T Primary-4ESS NSF dialing plan. The following keywords are supported: sdn , megacomm , and accunet .
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Defaults	This command is disabled; no class name is provided.
-----------------	------------------------------------------------------

Command Modes	Map-class dialer configuration
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Command History	Release	Modification
	11.0	This command was introduced.

Usage Guidelines	Use this command only to define a dialer map class for an NSF call-by-call service offered by AT&T on Primary-4ESS ISDN switches. This command is not used for other vendors and switch types.
-------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Examples	<p>The following partial example shows a class called sdn to support the Software Defined Network (SDN) dialing plan. For a more complete example using all the related commands, see the map-class dialer command.</p> <pre>dialer outgoing sdn</pre>
-----------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Related Commands	Command	Description
	dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	dialer voice-call	Configures the dialer map class for an NSF dialing plan to support outgoing voice calls.
	isdn nsf-service	Configures NSF on an ISDN PRI for outgoing calls configured as voice calls.
	map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.

dialer pool

To specify, for a dialer interface, which dialing pool to use to connect to a specific destination subnetwork, use the **dialer pool** command in interface configuration mode. To remove the dialing pool assignment, use the **no** form of this command.

dialer pool *number*

no dialer pool *number*

Syntax Description

<i>number</i>	Dialing pool number, in the range 1 through 255.
---------------	--------------------------------------------------

Defaults

Disabled. No default number is specified.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command applies to dialer interfaces only.

Examples

The following example shows a dialer interface configuration that is linked to the physical interface configuration shown for BRI 1 in the **dialer pool-member** command section. Dialer interface 1 uses dialer pool 3, of which BRI 1 is a member.

```
! This is a dialer profile for reaching remote subnetwork 10.1.1.1.
interface Dialer1
 ip address 10.1.1.1 255.255.255.0
 encapsulation ppp
 dialer remote-name Smalluser
 dialer string 4540
 dialer pool 3
 dialer-group 1
```

The following example might accompany the previous dialer profile configuration example. Physical interface BRI 1 has a reserved channel in dialer pool 3. That channel is inactive until BRI 1 uses it to place calls.

```
interface BRI1
 encapsulation ppp
 dialer pool-member 1 priority 50
 dialer pool-member 2 priority 50
 ! BRI 1 has a reserved channel in dialer pool 3; the channel remains inactive
 ! until BRI 1 uses it to place calls.
 dialer pool-member 3 min-link 1
 ppp authentication chap
```

Related Commands	Command	Description
	dialer pool-member	Configures a physical interface to be a member of a dialer profiles dialing pool.
	dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.

dialer pool-member

To configure a physical interface to be a member of a dialer profile dialing pool, use the **dialer pool-member** command in interface configuration mode. To remove the configuration, use the **no** form of this command.

dialer pool-member *number* [**priority** *priority*] [**min-link** *minimum*] [**max-link** *maximum*]

no dialer pool-member *number*

Syntax Description

<i>number</i>	Dialing pool number, in the range 1 through 255.
priority <i>priority</i>	(Optional) Priority of this interface within the dialing pool. Valid values for the <i>priority</i> argument range from 1 (lowest) to 255 (highest). The default priority is 1. Interfaces with the highest priority are selected first for dialing out.
min-link <i>minimum</i>	(Optional) Minimum number of B channels on this interface that are reserved for this dialing pool. Valid values for the <i>minimum</i> argument range from 1 to 255. The default minimum is 1. A reserved channel is inactive until the specified interface uses it to place calls. This option applies to ISDN outgoing interfaces only.
max-link <i>maximum</i>	(Optional) Maximum number of B channels on this interface that can be used by this dialing pool. Valid values for the <i>minimum</i> argument range from 1 to 255. The default maximum is 255. This option applies to ISDN interfaces only, and can be configured on both incoming and outgoing calls.

Command Default

The interface is not a member of a dialer profile dialing pool.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command applies to asynchronous serial, synchronous serial, BRI, and PRI *physical* interfaces only. It does not apply to dialer interfaces.

The common number used in the **dialer pool** command and in the **dialer pool-member** command links the physical interface and dialer interface configurations.

The **min-link** keyword and value are used primarily for dial backup.

The Cisco IOS software provides the **dialer max-links** interface configuration command and the **max-link** keyword with the **dialer pool-member** command to specify a maximum number of links. When two linked systems are configured to dial out, only one system needs to have the maximum number of links configured. Otherwise, if both systems dial simultaneously, each will reject the incoming call

when it exceeds the specified maximum links. If maximum links is configured to 1 and the dialing out is synchronized, no connection will come up or it will take many retries before a connection stays up. Some suggestions for correcting this behavior follow:

- Use only the **dialer max-links** command to restrict the number of connections. The result is the same as configuring the **dialer pool-member** command with the **max-link** keyword.
- If two systems will dial each other and only one link is desired, configure the **dialer max-links** command on just one system.
- Configure the **dialer load-threshold** interface configuration command on only one side, either local or remote, and configure the **dialer max-links** command on the interface where the **dialer load-threshold** command was configured.

Examples

The following example for a 23-channel ISDN PRI T1 interface shows that only one channel is available for incoming calls and 22 channels are reserved for outgoing calls:

```
dialer pool-member 1 min-link 22 max-link 23
```

The following sample report from the **debug dialer EXEC** command indicates that once one incoming call has been received, the next incoming call is denied:

```
Incoming call id 0x3 rejected, exceeded max calls
.
.
.
Incoming call id 0x3 rejected, exceeded
```

The following example reserves 19 channels for an incoming call on a 23-channel ISDN PRI T1 interface:

```
dialer pool-member 1 min-link 5 max-link 24
```

The following example shows the configuration of one ISDN BRI interface to be a member of dialer pool 2 with priority 100:

```
interface BRI2
 encapsulation ppp
 dialer pool-member 2 priority 100
 ppp authentication chap
```

In the following example, BRI physical interface configuration BRI 1 has one reserved channel in dialer pool 3. That channel is inactive until BRI 1 uses it to place calls.

```
interface BRI1
 encapsulation ppp
 dialer pool-member 1 priority 50
 dialer pool-member 2 priority 50
 !BRI 1 has a reserved channel in dialer pool 3; the channel remains inactive
 !until BRI 1 uses it to place calls.
 dialer pool-member 3 min-link 1
 ppp authentication chap
```

Related Commands

Command	Description
dialer pool	Specifies for a dialer interface, which dialing pool to use to connect to a specific destination subnetwork.

dialer priority

To set the priority of an interface in a dialer rotary group, use the **dialer priority** command in interface configuration mode. To revert to the default setting, use the **no** form of this command.

dialer priority *number*

no dialer priority

Syntax Description	<i>number</i>	Priority of an interface in a dialer rotary group; the highest number indicates the highest priority. This is a number from 0 through 255. The default value is 0, the lowest priority.
---------------------------	---------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Defaults No priority is predefined. When priority is defined, the default value is 0.

Command Modes Interface configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines

This command is meaningful only for interfaces that are part of dialer rotary groups.

The value 0 indicates the lowest priority, and 255 indicates the highest priority. The **dialer priority** command controls which interfaces within a dialer rotary group will be used first. Higher priority interfaces (configured with higher *n* value) are used first.

The **dialer priority** command gives you the ability to tell the dialer rotary group which free interface (and, by extension for asynchronous interfaces, which modem) to use first. This command applies to outgoing calls only.

For example, a router or access server might have a selection of many modems, some of which are better performers than others. You might have a 19.2-kbps, two 4800-bps, three 1200-bps, and one 300-bps modem on interfaces in one dialer rotary group. You do not want the router or access server to make the call on the 300-baud modem if any of the faster modems are free. You want to use the highest-performance modems first, and the slowest modems last.

Examples In the following example, asynchronous interface 3 will be used after interfaces with higher priority and before interfaces with lower priority:

```
interface async 3
 dialer priority 5
```

Related Commands	Command	Description
	dialer reserved-links	Includes a specified interface in a dialer rotary group.
	interface dialer	Defines a dialer rotary group.

dialer redial

To configure redial after failed outbound dial attempts, use the **dialer redial** command in interface configuration mode. To disable redial, use the **no** form of this command.

dialer redial interval *time* **attempts** *number* [**re-enable** *disable-time*]

no dialer redial

Syntax	Description
interval <i>time</i>	Time, in seconds, between redial attempts. The time can range from 5 to 2147483 seconds.
attempts <i>number</i>	The maximum number of redial attempts to be performed. The number can range from 1 to 2147483.
re-enable <i>disable-time</i>	(Optional) Time, in seconds, for which the interface will be disabled if all redial attempts fail. The time can range from 5 to 2147483 seconds.

Defaults Disabled

Command Modes Interface configuration

Command History	Release	Modification
	12.1(2)	This command was introduced.

Usage Guidelines Use this command to customize the number of redial attempts to be made, the interval between redial attempts, and the amount of time the interface will be disabled if all redial attempts fail. The **re-enable** option can be applied only to serial dialers.

Examples The following example configures the dialer to make 5 redial attempts with an interval of 10 seconds between attempts. If all redial attempts fail, the interface will be disabled for 50 minutes.

```
dialer redial interval 10 attempts 5 re-enable 3000
```

Related Commands	Command	Description
	debug dialer events	Displays debugging information about the packets received on a dialer interface.
	dialer rotor	Specifies the method for identifying the outbound line to be used for ISDN or asynchronous DDR calls.

dialer remote-name

To specify the authentication name of the remote router on the destination subnetwork for a dialer interface, use the **dialer remote-name** command in interface configuration mode. To remove the specified name, use the **no** form of this command.

dialer remote-name *user-name*

no dialer remote-name

Syntax Description	<i>user-name</i>	Case-sensitive character string identifying the remote device; maximum length is 255 characters.
---------------------------	------------------	--------------------------------------------------------------------------------------------------

Command Default	No remote name is specified.
------------------------	------------------------------

Command Modes	Interface configuration
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Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines	<p>This command applies only to dialer interfaces.</p> <p>Only one remote name can be associated with a dialer interface at a time. You may change the name associated with the dialer interface by reissuing the dialer remote-name command. Issuing the no dialer remote-name command removes the remote name configuration.</p> <p>When using Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP) authentication, <i>user-name</i> is the name of the remote device that is authenticating.</p>
-------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Examples	The following partial example sets the name of the remote host to yourhost:
-----------------	-----------------------------------------------------------------------------

```
interface dialer 1
 dialer remote-name yourhost
```

Related Commands	Command	Description
	ppp bap call	Sets PPP BACP call parameters.

dialer reserved-links

To reserve links for dial-in and dial-out, use the **dialer reserved-links** command in interface configuration mode. To clear the link, use the **no** form of this command.

dialer reserved-links { *dialin-link* \ *dialout-link* }

no dialer reserved-links

Syntax Description

<i>dialin-link</i>	Link reserved for dial-in.
<i>dialout-link</i>	Link reserved for dial-out.

Defaults

By default, no links are reserved.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(3)T	This command was introduced.

Examples

The following example sets dial in reserved links to 1 and dialout reserved links to 0 on the Dialer0 interface:

```
interface Dialer0
 dialer aaa
 dialer reserved-links 1 0
```

Related Commands

Command	Description
dialer congestion-threshold	Specifies congestion threshold in connected links.
sgbp dial-bids	Allows the stack group to bid for dialout connection.

dialer rotary-group

To include a specified interface in a dialer rotary group, use the **dialer rotary-group** command in interface configuration mode. To remove the specified interface, use the **no** form of this command.

dialer rotary-group *number*

no dialer rotary-group *number*

Syntax Description	<i>number</i>	Number of the previously defined dialer interface in whose rotary group this interface is to be included. This is a number from 0 to 255. The dialer interface is defined by the interface dialer command.
---------------------------	---------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Defaults	No interfaces are included in a dialer rotary group.
-----------------	------------------------------------------------------

Command Modes	Interface configuration
----------------------	-------------------------

Command History	Release	Modification
	10.0	This command was introduced.

Examples The following example places asynchronous interfaces 1 and 2 into dialer rotary group 1, defined by the **interface dialer 1** command:

```
hostname central-site
! PPP encapsulation is enabled for interface dialer 1.
interface dialer 1
  encapsulation ppp
  dialer in-band
  ip address 172.18.2.1 255.255.255.0
  ip address 172.16.4.1 255.255.255.0 secondary
!
! The first dialer map command allows the central site and remote site YYY
! to call each other and allows the central site to authenticate site YYY
! when it calls in. The second dialer map command, with no dialer string,
! allows the central site to authenticate remote site ZZZ when it calls in, but
! the central site cannot call remote site ZZZ (no phone number).
dialer map ip 172.18.2.5 name YYY 14155553434
dialer map ip 172.16.4.5 name ZZZ
!
! The DTR pulse signals for three seconds on the interfaces in dialer
! group 1. This holds the DTR low so the modem can recognize that DTR has been
! dropped.
pulse-time 3
!
! Interfaces async 1 and async 2 are placed in dialer rotary group 1.
! All of the interface configuration commands (the encapsulation and dialer
! map commands shown earlier in this example) applied to interface
! dialer 1 apply to the physical interfaces assigned to the dialer group.
!
```

dialer rotary-group

```
interface async 1
  dialer rotary-group 1
interface async 2
  dialer rotary-group 1
```

Related Commands

Command	Description
interface dialer	Defines a dialer rotary group.

dialer rotor

To specify the method for identifying the outbound line to be used for ISDN or asynchronous dial-on-demand routing (DDR) calls, use the **dialer rotor** command in interface configuration mode. To remove the specified method, use the **no** form of this command.

dialer rotor { **priority** | **best** }

no dialer rotor { **priority** | **best** }

Syntax Description

priority	Selects the first outbound line with the highest priority; this is the selection criterion that was previously used.
best	Selects the outbound line with the most recent success. If that line also has the most recent failure, then it will try the line with the least recent failure. If that line also has the most recent failure, it will then try an as-of-yet untried outbound line.

Defaults

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command allows the router to skip outbound ISDN BRI and asynchronous lines that have problems. This command would not be useful for ISDN PRI, unless your local telephone service provider has problems keeping your lines properly configured.

Related Commands

Command	Description
dialer priority	Sets the priority of an interface in a dialer rotary group.

dialer string

To specify the string (telephone number) to be called for interfaces calling a single site, use the **dialer string** command in interface configuration mode. To delete the dialer string specified for the interface, use the **no** form of this command.

dialer string *dial-string*[:*isdn-subaddress*]

no dialer string

Syntax Description

<i>dial-string</i>	String of characters to be sent to a DCE device.
<i>:isdn-subaddress</i>	(Optional) ISDN subaddress.

Defaults

No strings are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

To use this command on an asynchronous interface, you must define a modem chat script for the associated line by using the **script dialer** command. A script must be used to implement dialing.

Dialers configured as **in-band** pass the string to the external dialing device. Specify one **dialer string** command per interface.

To specify multiple strings, use the **dialer map** command. In general, you include a **dialer string** or **dialer map** command if you intend to use a specific interface to initiate a DDR call.



Note

If a **dialer string** command is specified without a **dialer-group** command with access lists defined, dialing is never initiated. If the **debug dialer** command is enabled, an error message is displayed indicating that dialing never will occur.

The string of characters specified for the *dial-string* argument is the default number used under the following conditions:

- A **dialer map** command is not included in the interface configuration.
- The next hop address specified in a packet is not included in any of the **dialer map** interface configuration commands recorded—assuming that the destination address passes any access lists specified for DDR with the **dialer-list** command.

ITU-T V.25bis Options

On synchronous interfaces, depending on the type of modem you are using, International Telecommunication Union Telecommunication (ITU-T) Standardization Sector V.25bis options might be supported as *dial-string* parameters of the **dialer string** command. Supported options are listed in Table 8. The functions of the parameters are nation specific, and they may have different implementations in your country. These options apply only if you have enabled DDR with the **dialer in-band** command. Refer to the operation manual for your modem for a list of supported options.



Note

The ITU-T carries out the functions of the former Consultative Committee for International Telegraph and Telephone (CCITT).

Table 8 ITU-T V.25bis Options

Option	Description
:	Wait tone.
<	Pause. Usage and duration of this parameter vary by country.
=	Separator 3. For national use.
>	Separator 4. For national use.
P	Dialing to be continued in pulse mode. Optionally accepted parameter.
T	Tone. Dialing to be continued in Dual Tone Multifrequency (DTMF) mode. Optionally accepted parameter.
&	Flash. (The flash duration varies by country.) Optionally accepted parameter.

Examples

The following example specifies a dial-on-demand routing (DDR) telephone number to be tone-dialed on interface *async 1* using the **dialer string** command:

```
interface async 1
dialer string T14085553434
```

Related Commands

Command	Description
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.
dialer in-band	Specifies that DDR is to be supported.
dialer-list protocol	Defines a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list.
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
script dialer	Specifies a default modem chat script.

dialer string (dialer profiles)

To specify the string (telephone number) to be used when placing a call from an interface, use the **dialer string** command in interface configuration mode. To delete the telephone number specified for the interface, use the **no** form of this command.

dialer string *dial-string* [**class** *class-name*]

no dialer string

Syntax Description

<i>dial-string</i>	Telephone number to be sent to a DCE device.
class <i>class-name</i>	(Optional) Dialer map class associated with this telephone number.

Defaults

No telephone numbers and class names are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

When you use dialer profiles for DDR, use the **dialer string class** form of this command to define a map class for a specific dialer profile.

Dialer profiles make it unnecessary to use dialer maps to configure DDR.



Note

If a **dialer string** command is specified without a **dialer-group** command with access lists defined, dialing is never initiated. If the **debug dialer** command is enabled, an error message is displayed indicating that dialing never will occur.

Examples

The following example specifies that the dial string 4159991234 be used in calls to destinations defined by the map class sf:

```
dialer string 4159991234 class sf
```

Related Commands

Command	Description
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.
dialer wait-for-carrier-time (map-class)	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
interface dialer	Defines a dialer rotary group.

dialer string (legacy DDR)

To specify the destination string (telephone number) to be called for interfaces calling a single site, use the **dialer string** command in interface configuration mode. To delete the dialer string specified for the interface, use the **no** form of this command.

dialer string *dial-string[:isdn-subaddress]*

no dialer string

Syntax Description

<i>dial-string</i>	String of characters to be sent to a DCE device.
<i>:isdn-subaddress</i>	(Optional) ISDN subaddress.

Defaults

No strings are predefined.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

To use this command on an asynchronous interface, you must define a modem chat script for the associated line by using the **script dialer** command. A script must be used to implement dialing.

Dialers configured as **in-band** pass the string to the external dialing device. Specify one **dialer string** command per interface.

In general, you include a **dialer string** command if you intend to use a specific interface to initiate a dial-on-demand routing (DDR) call.



Note

If a **dialer string** command is specified without a **dialer-group** command with access lists defined, dialing is never initiated. If the **debug dialer** command is enabled, an error message is displayed indicating that dialing never will occur.

The string of characters specified for the *dial-string* argument is the default number used under the following conditions:

- A **dialer map** command is not included in the interface configuration.
- The next hop address specified in a packet is not included in any of the **dialer map** command in interface configuration modes recorded—assuming that the destination address passes any access lists specified for DDR with the **dialer-list** command.

ITU-T V.25bis Options

On synchronous interfaces, depending on the type of modem you are using, International Telecommunication Union Telecommunication (ITU-T) Standardization Sector V.25bis options might be supported as *dial-string* parameters of the **dialer string** command. Supported options are listed in [Table 8](#). The functions of the parameters are nation specific, and they may have different implementations in your country. These options apply only if you have enabled DDR with the **dialer in-band** command. Refer to the operation manual for your modem for a list of supported options.

**Note**

The ITU-T carries out the functions of the former Consultative Committee for International Telegraph and Telephone (CCITT).

Examples

The following example specifies a DDR telephone number to be tone-dialed on asynchronous interface 1 using the **dialer string** command:

```
interface async 1
dialer string T14085553434
```

Related Commands

Command	Description
dialer-group	Controls access by configuring an interface to belong to a specific dialing group.
dialer in-band	Specifies that DDR is to be supported.
dialer-list protocol	Defines a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list.
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
script dialer	Specifies a default modem chat script.

dialer voice-call

To configure the dialer map class for a Network Specific Facilities (NSF) dialing plan to support outgoing voice calls, use the **dialer voice-call** command in map-class dialer configuration mode.

dialer voice-call

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Map-class dialer configuration

Command History	Release	Modification
	11.0	This command was introduced.

Examples The following partial example defines a dialer map class to support the SDN dialing plan and to support outgoing voice calls. For a more complete example using all the related commands, see the **map-class dialer** command.

```
map-class dialer sdnplan
  dialer voice-call
  dialer outgoing sdn
```

Related Commands	Command	Description
	dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	dialer outgoing	Configures the dialer map class for a NSF dialing plan to support outgoing calls.
	map-class dialer	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.

dialer vpdn

To enable a dialer profile or dial-on-demand routing (DDR) dialer to use Layer 2 Tunnel Protocol (L2TP) dialout, use the **dialer vpdn** command in interface configuration mode. To disable L2TP dialout on a dialer profile or DDR dialer, use the **no** form of this command.

dialer vpdn

no dialer vpdn

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Interface configuration

Command History

Release	Modification
12.0(5)T	This command was introduced.

Usage Guidelines

The **dialer vpdn** command must be configured on the LNSs dialer interface to enable L2TP dialout. This command enables the dialer to place a VPDN call.

Examples

The following example shows how to configure the dialer interface and VPDN group on an LNS for L2TP dialout:

```
interface Dialer2
 ip address 172.16.2.3 255.255.255.128
 encapsulation ppp
 dialer remote-name reuben
 dialer string 5551234
 dialer vpdn
 dialer pool 1
 dialer-group 1
 ppp authentication chap

vpdn-group 1
 request-dialout
 protocol l2tp
 pool-member 1
 initiate-to ip 172.21.9.4
```

Related Commands	Command	Description
	dialer aaa	Allows a dialer to access the AAA server for dialing information.
	request-dialout	Enables an LNS to request VPDN dial-out calls by using L2TP.

dialer wait-for-carrier-time (interface)

To specify the length of time the interface waits for a carrier, use the **dialer wait-for-carrier-time** command in interface configuration mode. To reset the carrier wait time value to the default, use the **no** form of this command.

dialer wait-for-carrier-time *seconds*

no dialer wait-for-carrier-time

Syntax Description	<i>seconds</i>	Number of seconds that the interface waits for the carrier to come up when a call is placed. Acceptable values are positive, nonzero integers.
---------------------------	----------------	------------------------------------------------------------------------------------------------------------------------------------------------

Defaults	30 seconds
-----------------	------------

Command Modes	Interface configuration
----------------------	-------------------------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines

On asynchronous interfaces, the **dialer wait-for-carrier-time** command sets the total time allowed for the chat script to run.

If a carrier signal is not detected in this amount of time, the interface is disabled until the enable timeout occurs (configured with the **dialer enable-timeout** command).

Do not use this command for BRI and leased-line interfaces.

Examples

The following example specifies a carrier wait time of 45 seconds on asynchronous interface 1:

```
interface async 1
dialer wait-for-carrier-time 45
```

Related Commands	Command	Description
	dialer enable-timeout	Sets the length of time an interface stays down after a call has completed or failed and before the interface is available to dial again.

dialer wait-for-carrier-time (map-class)

To specify the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class, use the **dialer wait-for-carrier-time** command in map-class dialer configuration mode. To reset the carrier wait time value to the default, use the **no** form of this command.

dialer wait-for-carrier-time *seconds*

no dialer wait-for-carrier-time

Syntax Description	<i>seconds</i>	Number of seconds that the interface waits for the carrier to come up when a call is placed. Acceptable values are positive, nonzero integers. The default is 30 seconds.
---------------------------	----------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Defaults	30 seconds
-----------------	------------

Command Modes	Map-class dialer configuration
----------------------	--------------------------------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines

You can define different dialer map classes with different wait-for-carrier times to suit the different types of lines and interfaces. For example, you must define a longer wait time for a map class used by serial interfaces than for one used by ISDN interfaces.

Do not use this command for BRI and leased-line interfaces.

Examples

The following example specifies a carrier wait time of 20 seconds for the Eng class on the Dialer2 interface:

```
interface Dialer2
 ip address 10.2.2.2 255.255.255.0
 encapsulation ppp
 dialer remote-name Mediumuser
 dialer string 5264540 class Eng
 dialer wait-for-carrier-time 20
 dialer load-threshold 50 either
 dialer pool 1
 dialer-group 2
```

dialer watch-disable

To set a delay time to the backup interface, use the **dialer watch-disable** command in interface configuration mode. To disable this feature, use the **no** form of this command.

dialer watch-disable *timeout*

no dialer watch-disable

Syntax Description	<i>timeout</i>	The timeout value in seconds.
--------------------	----------------	-------------------------------

Defaults	Disabled
----------	----------

Command Modes	Interface configuration
---------------	-------------------------

Command History	Release	Modification
	11.3 T	This command was introduced.

Usage Guidelines	This command is used to add a delay time to the backup interface. The delay time delays the time it takes for the backup interface to disconnect after the primary interface recovers.
------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Examples	The following example forces a 6-second delay to the backup interface once the primary interface recovers:
----------	------------------------------------------------------------------------------------------------------------

```
interface bri0
 ip address 10.1.1.2 255.255.255.0
 encapsulation ppp
 dialer map ip 10.3.1.1 255.255.255.0 name hubble 5551234
 dialer-group 1
 dialer watch-group 1
 dialer watch-disable 6
```

Related Commands	Command	Description
	show dialer dnis	Displays general diagnostic information for ISDN BRI interfaces configured for DDR.

dialer watch-group

To enable dial-on-demand routing (DDR) backup on an interface using Dialer Watch, configure the interface using the **dialer watch-group** command in interface configuration mode. To disable this feature, use the **no** form of this command.

dialer watch-group *group-number*

no dialer watch-group *group-number*

Syntax Description

<i>group-number</i>	Group number assigned that will point to a globally defined list of IP addresses to watch. The valid range is 1 to 255.
---------------------	-------------------------------------------------------------------------------------------------------------------------

Defaults

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
11.3 T	This command was introduced.

Usage Guidelines

Use the **dialer watch-group** command on the secondary interface you want to enable DDR backup.

The dialer watch group number points to a globally defined list (the **dialer watch-list** command) that contains the IP addresses to be watched. If you use the **dialer watch-group** command you must also use the **dialer watch-list** command.

You must configure the standard commands required to enable the router to perform DDR in addition to the Dialer Watch commands. Refer to Cisco IOS Release 12.1 configuration guides and command references for additional information.

The **dialer watch-group** and **dialer watch-list** commands can be added in any order.

Examples

The following example configures BRI interface 0 as the backup interface:

```
interface bri0
 ip address 10.1.1.2 255.255.255.0
 encapsulation ppp
 dialer watch-group 1
```

Related Commands

Command	Description
dialer watch-list	Adds the list of IP addresses to be monitored for Dialer Watch.

dialer watch-list

To add to the list of IP addresses to be monitored for Dialer Watch or to configure the router to dial the backup link if the primary link fails during initial startup, use the **dialer watch-list** command in global configuration mode. To disable these features, use the **no** form of this command.

```
dialer watch-list group-number {ip ip-address address-mask | delay route-check initial time}
```

```
no dialer watch-list group-number {ip ip-address address-mask | delay route-check initial time}
```

Syntax Description

<i>group-number</i>	Group number assigned to the list. Valid group numbers are between 1 and 255.
ip	IP is the only routed protocol supported for Dialer Watch.
<i>ip-address</i>	IP address or address range to be applied to the list.
<i>address-mask</i>	IP address mask to be applied to the list.
delay route-check initial time	Time, in seconds, after which the router ensures that the primary route is up once initial startup is complete.

Defaults

Disabled

Command Modes

Global configuration

Command History

Release	Modification
11.3 T	This command was introduced.
12.1(3)T	The delay route-check initial time keywords and argument were introduced.

Usage Guidelines

Use this command to add all IP addresses or networks you want monitored. There is no software limit to the number of protocol addresses that can be added to the group. The **dialer watch-list** and **dialer watch-group** commands can be added in any order.

Use this command with the **dialer watch-group** interface configuration command. The number of the group list must match the group number. For example, if you use **dialer watch-group 1**, you must also use **dialer watch-list 1**.

Address matching is exact; therefore, you must apply the specific IP address and mask range for the networks you want monitored. Use the **show ip route** command to verify that the route you are watching exists in the routing table. The route configured for the Dialer Watch feature must match the one in the routing table exactly. This includes verifying that both the network and the masks are identical. You must configure the standard commands required to enable the router to perform dial-on-demand routing (DDR) in addition to configuring the Dialer Watch commands. Refer to Cisco IOS configuration guides and command references for additional information.

The Dialer Watch feature is triggered only when the primary route is removed from the routing table. If the primary link fails to come up during initial startup of the router, the route is never added to the routing table and will not be watched. Enabling the **delay route-check initial time** option of the **dialer watch-list** command ensures that the router will dial the backup link if a primary link fails during initial startup.

Examples

The following example adds the IP addresses to be watched:

```
dialer watch-list 1 ip 10.1.1.0 255.255.255.0
dialer watch-list 1 ip 10.31.1.0 255.255.255.0
dialer watch-list 1 ip 10.12.1.0 255.255.255.0
```

Related Commands

Command	Description
dialer watch-group	Enables DDR backup on an interface using Dialer Watch.
show ip route	Displays all static IP routes, or those installed using the AAA route download function.

dial-peer cor custom

To specify that named class of restrictions (COR) apply to dial peers, use the **dial-peer cor custom** command in global configuration mode.

dial-peer cor custom

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or keywords.

Command Modes Global configuration

Command History	Release	Modification
	12.1(3)T	This command was introduced.

Usage Guidelines You must use the **dial-peer cor custom** command and the **name** command to define the names of capabilities before you can specify COR rules and apply them to specific dial peers. Examples of possible names might include the following: call1900, call527, call9, and call911.



Note

You can define a maximum of 64 COR names.

Examples The following example defines two COR names:

```
dial-peer cor custom
 name 900blackhole
 name CatchAll
```

Related Commands	Command	Description
	name (dial peer cor custom)	Provides a name for a custom COR.

dial-peer cor list

To define a class of restrictions (COR) list name, use the **dial-peer cor list** command in global configuration mode. To remove a previously defined COR list name, use the **no** form of this command.

dial-peer cor list *list-name*

no dial-peer cor list *list-name*

Syntax Description	<i>list-name</i>	List name that is applied to incoming or outgoing calls to specific numbers or exchanges.
---------------------------	------------------	-------------------------------------------------------------------------------------------

Defaults	No default behavior or keywords.
-----------------	----------------------------------

Command Modes	Global configuration
----------------------	----------------------

Command History	Release	Modification
	12.1(3)T	This command was introduced.

Usage Guidelines	A COR list defines a capability set that is used in the COR checking between incoming and outgoing dial peers.
-------------------------	----------------------------------------------------------------------------------------------------------------

Examples The following example adds two members to the COR list named list1:

```
dial-peer cor list list1
  member 900block
  member 800_call
```

Related Commands	Command	Description
		dial-peer cor custom
	member (dial peer cor list)	Adds a member to a dial peer COR list.
	name (dial peer cor custom)	Provides a name for a custom COR.

dial-shelf split backplane-ds0

To connect two router shelves to a dial shelf, use the **dial-shelf split backplane-ds0** command in global configuration mode. To remove the connection, use the **no** form of this command.

dial-shelf split backplane-ds0 {*predefined-option* | **userdefined** *option*}

no dial-shelf split backplane-ds0

Syntax Description

predefined-option Predefined backplane DS-0 pairs. See [Table 9](#) for a list of these options.

userdefined option Number of backplane DS-0 interfaces used by the router shelf that you define, in the range 128 to 2048.

Defaults

[Table 9](#) lists the predefined options.

Table 9 *dial-shelf split backplane ds-0 Predefined Options*

Option Pair	Router Shelf 1			Router Shelf 2			Total
	Option	Maximum Calls	Unused T1	Option	Maximum Calls	Unused T1	
1	2ct3cas	1344		1ct3cas	672		2016
2	part2ct1ct3cas	1152	4	part1ct1ct3cas	888	3	2040
3	2ct3isdn	1288		part1ct1ct3isdn_b	644	7	1932
4	part2ct1ct3isdn	1150	2	part1ct1ct3isdn	897	1	2047
5 ¹	3ce1	960		3ce1	960		1920
6	Default (no option entered)	1/2 of current input		Default (no option entered)	1/2 of current input		
7	no dial-shelf backplane-ds0	1024		no dial-shelf backplane-ds0	1024		2048

1. This option is used to revert to the default for an environment that uses six E1 lines.

Command Modes

Global configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

The options for this command come in pairs and vary according to the desired configuration. You will need to log in to each router shelf and separately configure the routers for the intended load. In most circumstances, it is recommended that the predefined options remain selected. These options are designed to be matched pairs, as seen in [Table 9](#). You can select the **userdefined** keyword and define your own split, if needed.

The **dial-shelf split slot** command must be defined for the **dial-shelf split backplane-ds0** command to be active.

Even if your system is already using a split dial shelf configuration, configuring one router shelf to handle two T3 trunks and the other router to handle the third trunk requires you to take the entire access server out of service. Busyout all connections before attempting to reconfigure. The configuration must be changed to set up one pool of TDM resources that can be used by either DMM cards or UPC and a second pool of two streams that contains TDM resources that can be used only by UPCs.

You may have more trunk capacity than 2048 calls. It is your decision how to provision the trunks so the backplane capacity is not exceeded. If more calls come in than backplane DS0 capacity for that half of the split, the call will be rejected and an error message printed for each call. This cannot be detected while a new configuration is being built because the router cannot tell which T1 trunks are provisioned and which are not. The user may want some trunks in hot standby.

The DMM, HMM, and VoIP cards can use only 1792 DS0 of the available 2048 backplane DS0. The UPC and trunk cards can use the full 2048 backplane DS0.

The **show tdm splitbackplane** command shows the resources in two groups, the first 1792 accessible to all cards, and the remaining 256 accessible only to UPC and trunk cards.

Examples

The following example shows how to configure two router shelves. Refer to [Table 9](#) to interpret the options specified.

Configure router shelf 1 to run two CT3 interfaces with channel-associated signaling (CAS) and the ability to answer 1344 calls:

```
dial-shelf split backplane-ds0 2ct3cas
```

Configure router shelf 2 to run one CT3 interface with CAS on the second router shelf and the ability to answer 672 calls:

```
dial-shelf split backplane-ds0 1ct3cas
```

The total calls configured for the system are 2036 (1344 plus 672).

Related Commands

Command	Description
dial-shelf split slots	Configures split dial shelves.
show tdm splitbackplane	Displays modem and PRI channel assignments with streams and channels on the modem side as assigned to the unit and channels on the PRI side of the TDM assignment.

dial-shelf split slots

To configure split dial shelves, use the **dial-shelf split slots** command in global configuration mode. To change the router shelf to normal mode, if a router is in split mode and the other router shelf has already relinquished control of all dial shelf slots or is switched off, use the **no** form of this command.

dial-shelf split slots *slot-numbers*

no dial-shelf split slots

Syntax Description

slot-numbers List of the dial shelf slot numbers that the router owns in the range 0 to 11, separated by spaces. Slot ownership for each of the two router shelves is configured individually using the **dial-shelf split slots** command.

Defaults

No default behavior or keywords.

Command Modes

Global configuration

Command History

Release	Modification
11.3(8)AA	This command was introduced.

Usage Guidelines

You allocate the slots in the dial shelf between the two router shelves to achieve the desired configuration. The two router shelves are both configured to run in split mode by means of the **dial-shelf split slots** command. While a router is in split mode, additional slots can be added to the set that the router owns by re-entering the **dial-shelf split slots** command listing the new slots. The effect of entering two or more **dial-shelf split slots** commands with different slot numbers is cumulative.

Slots must be explicitly removed from the list of router-owned slots with the **dial-shelf split slots remove** command.

A single router can also be configured in split mode, but with no slots owned, by using the **dial-shelf split slots none** command.

When you configure a Cisco AS5800 system to operate in split mode, it is the same as having two Cisco AS5800 systems with each having a separate set of feature boards assigned to its router; they just happen to be sharing a single dial shelf. Modem pooling, for example, is the same as if you had two separate Cisco AS5800 systems. Router shelf 1 has a modem pool that consists of all the modem cards that reside in slots owned by router shelf 1. The same situation applies to router shelf 2.

Examples

The following example would configure the router shelf to own slots 0 through 2 and 6 through 8.

```
dial-shelf split slots 0 1 2 6 7 8
```

In this example, the other router shelf could be configured to own the other slots: 3, 4, 5, 9, 10, and 11.

Related Commands

Command	Description
dial-shelf split backplane-ds0	Connects two router shelves to a dial shelf.
dial-shelf split slots none	Configures the router in dial shelf split mode but with no slots owned.
dial-shelf split slots remove	Removes slots configured in split mode.

dial-shelf split slots none

To configure the router in dial shelf split mode but with no slots owned, use the **dial-shelf split slots none** command in global configuration mode.

dial-shelf split slots none

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or keywords.

Command Modes Global configuration

Command History	Release	Modification
	11.3(8)AA	This command was introduced.

Usage Guidelines The **dial-shelf split slots none** command is useful for configuring a single router in split mode, but with no slots owned.

Examples The following example changes dial shelf slot ownership. The router will no longer have ownership of any dial shelf slots.

```
dial-shelf split slots none
```

Related Commands	Command	Description
	dial-shelf split slots remove	Removes slots configured in split mode.

dial-shelf split slots remove

To remove slots configured in split mode, use the **dial-shelf split slots remove** command in global configuration mode.

dial-shelf split slots remove *slot-numbers*

Syntax Description	<i>slot-numbers</i>	List of the dial shelf slot numbers to be removed ,separated by spaces, in the range 0 to 11.
---------------------------	---------------------	-----------------------------------------------------------------------------------------------

Defaults	No default behavior or keywords.
-----------------	----------------------------------

Command Modes	Global configuration
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Command History	Release	Modification
	11.3(8)AA	This command was introduced.

Usage Guidelines

To move a slot from the control of one router shelf to the others, the router releasing the slot should be modified first by entering the **dial-shelf split slots remove** command, specifying the slot numbers to be released. The released slots can then be added to the slot set of the other router by re-entering the **dial-shelf split slots** command including the new slot numbers.

The router shelf that is losing the slot frees any resources and clears any state associated with the card in the slot it is relinquishing. The dial shelf controller (DSC) reconfigures its hub to ignore traffic from that slot, and if there is a card in the slot it will be reset. This ensures that the card frees up any TDM resource it might be using and allows it to restart under control of the router shelf that is subsequently configured to own the slot.

Examples

The following example removes dial shelf slot 8 from the list of owned dial shelf slots:

```
dial-shelf split slots remove 8
```

The effect of multiple commands is cumulative.

Related Commands	Command	Description
	dial-shelf split slots none	Configures the router in dial shelf split mode but with no slots owned.

dial-tdm-clock

To configure the clock source and priority of the clock source used by the time-division multiplexing (TDM) bus on the dial shelf of the Cisco AS5800, use the **dial-tdm-clock** command in global configuration mode. To return the clock source and priority to the default values, use the **no** form of this command.

dial-tdm-clock *priority number* { **external** { **e1** | **t1** } [**120ohm**] | **freerun** | **trunk-slot** *slot port port* }

no dial-tdm-clock *priority number* { **external** { **e1** | **t1** } [**120ohm**] | **freerun** | **trunk-slot** *slot port port* }

Syntax Description

priority <i>number</i>	Priority of the clock source. The range is 1 to 50. Priority 1 is the highest priority and 50 is the lowest.
external	Priority of an external clock source. The external clock source is connected to the front panel of the dial shelf controller (DSC) card.
{ e1 t1 } [120ohm]	Priority of the E1 (2.048 MHz) or T1 (1.54 MHz) external clock source. The default value of the external coaxial cable impedance is 75 ohm. Specify the 120ohm option if a 120 ohm coaxial cable is connected.
freerun	Priority of the local oscillator clock source.
trunk-slot <i>slot</i>	Priority of the trunk card to provide the clock source. The slot number is from 0 to 5 (these are the only slots capable of providing clock sources).
port <i>port</i>	Controller number on the trunk used to provide the clock source. The port number is from 0 to 28. The T1 and E1 trunk cards each have 12 ports. The T3 trunk card has 28 ports.

Defaults

If no clock sources are specified, the software selects the first available good clock source on a trunk port.

Command Modes

Global configuration

Command History

Release	Modification
11.3(2)AA	This command was introduced.

Usage Guidelines

The TDM bus in the backplane on the dial shelf must be synchronized to the T1/E1 clocks on the trunk cards. The Dial Shelf Controller (DSC) card on the dial shelf provides hardware logic to accept multiple clock sources as input and use one of them as the primary source to generate a stable, PPL synchronized output clock.

The input clock can be any of the following sources:

- Trunk port in slots 0 through 5 (up to 12 can be selected (two per slot))
- An external T1 or E1 clock source fed directly through a connector on the DSC card
- A free running clock from an oscillator in the clocking hardware on the DSC card

The clock commands are listed in the configuration file with the highest priority listed first.

If the current primary clock source is good, specifying another clock source of higher priority does not cause the clock source to switch to the higher priority clock source. The new higher priority clock source is used as a backup clock source. This prevents switching of the clock source as you enter multiple **dial-tdm-clock priority** configuration commands in random order. Also, it is important not to disturb the existing clock source as long as it is good. To force the new higher priority clock source to take over from a currently good primary clock source, configure the new clock source and use the **no dial-tdm-clock priority** command to remove the current primary clock source.

To display the current primary and backup clocks along with their priorities, use the **show dial-shelf clocks EXEC** command.

Examples

In the following example, an external clock source is set at priority 1 and the trunk card in slot 4 port 1 is set at priority 5:

```
configure terminal
dial-tdm-clock priority 1 external t1
dial-tdm-clock priority 5 trunk-slot 4 port 1
exit
```

Related Commands

Command	Description
show dial-shelf	Displays information about the types of cards in nonowned dial shelf slots.

disconnect

To disconnect a line, use the **disconnect** command in EXEC mode.

disconnect [*connection*]

Syntax Description	<i>connection</i> (Optional) Number of the line or name of the active network connection to be disconnected.
---------------------------	--------------------------------------------------------------------------------------------------------------

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines	Do not disconnect a line to end a session. Instead, log off the host, so that the Cisco IOS software can clear the connection. Then end the session. If you cannot log out of an active session, disconnect the line.
-------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Examples	In the following example, the user disconnects from the device Slab to return to the router:
-----------------	----------------------------------------------------------------------------------------------

```
Slab% disconnect
Connection closed by remote host

Router#
```

Related Commands	Command	Description
	login (EXEC)	Enables or changes a login user name.

dnis (VPDN)

To specify the Dialed Number Identification Service (DNIS) group name or DNIS number of users that are to be forwarded to a tunnel server using a virtual private dialup network (VPDN), use the **dnis** command in request dial-in VPDN subgroup configuration mode. To remove a DNIS group or number from a VPDN group, use the **no** form of this command.

```
dnis {dnis-group-name | dnis-number}
```

```
no dnis {dnis-group-name | dnis-number}
```

Syntax Description

<i>dnis-group-name</i>	DNIS group name used when resource pool management (RPM) is enabled and the VPDN group is configured under the incoming customer profile.
<i>dnis-number</i>	DNIS group number used when RPM is disabled, or when a call is associated with a customer profile without any VPDN group configured for the customer profile.

Defaults

Disabled

Command Modes

Request dial-in VPDN subgroup configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.

Usage Guidelines

You must specify a tunneling protocol using the **protocol** command in request dial-in VPDN subgroup configuration mode before issuing the **dnis** command. Removing or changing the **protocol** command configuration removes any existing **dnis** command configuration from the request dial-in VPDN subgroup.

You can configure a VPDN group to tunnel multiple DNIS group names and DNIS numbers by issuing multiple instances of the **dnis** command.

VPDN groups can also be configured to tunnel users based on domain name using the **domain** command.

Examples

The following example configures a VPDN group to tunnel calls from multiple DNIS numbers and from the domain cisco.com to the tunnel server at 10.1.1.1 using the Layer 2 Forwarding (L2F) protocol:

```
Router(config)# vpdn-group users
Router(config-vpdn)# request dialin
Router(config-vpdn-req-in)# protocol l2f
Router(config-vpdn-req-in)# dnis 1234
Router(config-vpdn-req-in)# dnis 5678
Router(config-vpdn-req-in)# domain cisco.com
!
Router(config-vpdn)# initiate-to 10.1.1.1
```

Related Commands	Command	Description
	dialer dnis group	Creates a DNIS group.
	domain	Specifies the domain name of users that are to be forwarded to a tunnel server using VPDN.
	dnis group	Includes a group of DNIS numbers in a customer profile.
	protocol (VPDN)	Specifies the tunneling protocol that the VPDN subgroup will use.
	request-dialin	Creates a request dial-in VPDN subgroup that configures a NAS to request the establishment of a dial-in tunnel to a tunnel server, and enters request dial-in VPDN subgroup configuration mode.

dnis group

To include a group of Dialed Number Identification Service (DNIS) numbers in a customer profile, use the **dnis group** command in customer profile configuration mode. To remove a DNIS group from a customer profile, use the **no** form of this command.

```
dnis group { default | name name }
```

```
no dnis group { default | name name }
```

Syntax Description

default	Allows a specified customer profile to accept all DNIS numbers coming into the access server. For example, a stray DNIS number not listed in any customer profile passes through this default DNIS group. Most customer profiles do not have this option configured.
name	Assigns a name to a DNIS group.
<i>name</i>	DNIS group name. It can have up to 23 characters.

Defaults

No DNIS groups are associated with a customer profile.

Command Modes

Customer profile configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.

Usage Guidelines

Use the **dnis group** customer profile configuration command to include a group of DNIS numbers in a customer profile or discriminator.

Examples

The following example includes the DNIS group called customer1dnis in the customer1 customer profile:

```
resource-pool profile customer customer1
dnis group customer1dnis
```

Related Commands

Command	Description
dialer dnis group	Creates a DNIS group.
resource-pool profile customer	Creates a customer profile.

domain

To specify the domain name of users that are to be forwarded to a tunnel server using a virtual private dialup network (VPDN), use the **domain** command in request dial-in VPDN subgroup configuration mode. To remove a domain from a VPDN group or subgroup, use the **no** form of this command.

domain *domain-name*

no domain [*domain-name*]

Syntax Description

domain-name Case-sensitive name of the domain that will be tunneled.

Defaults

Disabled

Command Modes

Request dial-in VPDN subgroup configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.

Usage Guidelines

You must specify a tunneling protocol using the **protocol** command in request dial-in VPDN subgroup configuration mode before issuing the **domain** command. Removing or changing the **protocol** command configuration removes any existing **domain** command configuration from the request dial-in VPDN subgroup.

You can configure a request dial-in VPDN subgroup to tunnel calls from multiple domain names by issuing multiple instances of the **domain** command.

VPDN groups can also be configured to tunnel users based on Dialed Number Identification Service (DNIS) group names or DNIS numbers using the **dnis** command.

Examples

The following example configures VPDN group 1 to request a dial-in Layer 2 Tunnel Protocol (L2TP) tunnel to IP address 10.99.67.76 when it receives a PPP call from a username with the domain name cisco1.com, the domain name cisco2.com, or the DNIS number 4321:

```
Router(config)# vpdn-group 1
Router(config-vpdn)# request-dialin
Router(config-vpdn-req-in)# protocol l2tp
Router(config-vpdn-req-in)# domain cisco1.com
Router(config-vpdn-req-in)# domain cisco2.com
Router(config-vpdn-req-in)# dnis 4321
!
Router(config-vpdn)# initiate-to ip 10.99.67.76
```

Related Commands	Command	Description
	dnis	Specifies the DNIS group name or DNIS number of users that are to be forwarded to a tunnel server using VPDN.
	protocol (VPDN)	Specifies the tunneling protocol that the VPDN subgroup will use.
	request-dialin	Creates a request dial-in VPDN subgroup that configures a NAS to request the establishment of a dial-in tunnel to a tunnel server, and enters request dial-in VPDN subgroup configuration mode.

ds0 busyout (channel)

To busyout one or more digital signal level 0s (DS0s), use the **ds0 busyout** command in controller configuration mode. To cancel busyout on a DS0, use the **no** form of this command.

ds0 busyout *ds0*

no ds0 busyout *ds0*

Syntax Description

ds0 DS0 number listed as a single channel or channel range. The range of numbers can be from 1 to 24 for T1. For example, from 1 to 10, or from 10 to 24.

Defaults

Busyout is disabled.

Command Modes

Controller configuration

Command History

Release	Modification
11.3(2)AA	This command was introduced, and supported T1 and T3 only.
12.0	This command was integrated into Cisco IOS Release 12.0, and supported the E1 and DMM HMM (Double Modem Module [12] Hex Modem Module [6]).

Usage Guidelines

Use the **ds0 busyout** command when you to busyout a one or more DS0s (channels). If there is an active call, the software waits until the call terminates by a disconnection; then the DS0 is busied out. First you must specify the T1 line (port) containing the 24 DS0s, using the **controller T1** command.

To busyout all DS0s on a trunk card or all modems on a modem card, use the **busyout** privileged EXEC command.

To display the busyout information, use the **show busyout** privileged EXEC command.



Note

The **ds0 busyout** command only applies to **cas-group** command configurations for channel-associated signalling. This command has no effect on **pri-group** command configurations.

Examples

In this example, the controller T1 is configured with cas-group (channel-associated signalling). The following example removes DS0s 1 through 10 from dialup services. These DS0s are assigned to the T1 port (line) in shelf 6, slot 0, port 0:

```
controller t1 6/0/0
 ds0 busyout 1-10
 exit
```

Related Commands

Command	Description
busyout	Informs the central-office switch that a channel is out of service.
modem busyout	Disables a modem from dialing or answering calls whereby the disabling action is not executed until the active modem returns to an idle state.
modem busyout-threshold	Maintains a balance between the number of DS0s and modems.
modem shutdown	Abruptly shuts down an active or idle modem installed in an access server or router.
show busyout	Displays the busyout status for a card on the dial shelf.
show dial-shelf	Displays information about the dial shelf, including clocking information.

ds0 busyout-threshold

To define a threshold to maintain a balance between the number of DS0s and modems, use the **ds0 busyout-threshold** command in global configuration mode. To remove the threshold, use the **no** form of this command.

Cisco AS5300 and AS5800 Access Servers Only

ds0 busyout-threshold *threshold-number*

no ds0 busyout-threshold *threshold-number*



Note

This command is the same as the **modem busyout-threshold** command for the Cisco AS5350 and AS5400 access servers.

Syntax Description

<i>threshold-number</i>	Number of modems that are free when the router should enforce the stipulation that the number of free DS0 lines is less than or equal to the number of modems.
-------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------

Command Modes

Global configuration

Command History

Release	Modification
11.3(2)AA	This command was introduced as modem busyout-threshold .
12.2	This command was changed to ds0 busyout-threshold for the Cisco AS5300 and AS5800 access servers.

Usage Guidelines

The **ds0 busyout-threshold** command functionality is also often termed **autobusyout**. This command applies to all DS0 lines coming into the router and counts all free modems in all pools.

The **ds0 busyout-threshold** command periodically checks to see if the number of free modems is less than the user specified threshold and if it is it ensures the number of free DS0 channels is less than or equal to the number of modems.

This command should only be used where excess calls to one router are forwarded by the exchange to an additional router on the same exchange group number.

Since the **ds0 busyout-threshold** command checks only periodically, the threshold should be greater than the number of calls the user expects to receive in 1 minute plus a safety margin. For example, if the user receives an average of 10 calls per minute, then a threshold of 20 would be advised. Very small thresholds should be avoided since they do not allow sufficient time for the exchange to respond to out-of-service notifications from the router, and callers may receive busy signals when free modems are all used.

**Caution**

The number of DS0 lines in normal operating conditions should be approximately equal to the number of modems (for example, within 30). If it is not, this will cause a lot of messaging traffic to the exchange and may cause active calls to be dropped. This is not a concern for short periods, that is, when modem cards are replaced.

On T3 controllers, any contained T1 controllers that are not in use should be undeclared to remove them from the **autobusyout** list.

Examples

The following example shows how you might configure the **ds0 busyout-threshold** command:

```
ds0 busyout-threshold 30
```

Related Commands

Command	Description
busyout	Informs the central-office switch that a channel is out-of-service.
ds0 busyout (channel)	Forces a DS0 timeslot on a controller into the busyout state.
modem busyout	Disables a modem from dialing or answering calls whereby the disabling action is not executed until the active modem returns to an idle state.
modem shutdown	Abruptly shuts down an active or idle modem installed in an access server or router.

ds0-group (controller e1)

To define E1 channels for compressed voice calls and the channel-associated signaling (CAS) method by which the router connects to the PBX or PSTN, enter the **ds0-group** command in controller configuration mode. To remove the group and signaling setting, use the **no** form of this command.

ds0-group *channel* *timeslots range* **type** *signal*

no ds0-group *channel* *timeslots range* **type** *signal*

Syntax Description

<i>channel</i>	Specifies a single channel group number. Replace the <i>channel</i> variable with a number from 0 through 30.
timeslots <i>range</i>	Specifies a time-slot range, which can be from 1 through 31. You can specify a time-slot range (for example, 1-31), individual time-slots separated by commas (for example 1, 3, 5), or a combination of the two (for example 1-14, 15, 17-31). The sixteenth time slot is reserved for out-of-band signaling.
type <i>signal</i>	Specifies the type of channel-associated signaling. Configure the signal type that your central office uses. Replace the <i>signal</i> argument with one of the following signal types: <ul style="list-style-type: none"> • r2-analog [r2-compelled [ani] r2-non-compelled [ani] r2-semi-compelled [ani]] • r2-digital [r2-compelled [ani] r2-non-compelled [ani] r2-semi-compelled [ani]] • r2-pulse [r2-compelled [ani] r2-non-compelled [ani] r2-semi-compelled [ani]]

The following descriptions are provided for the previous three R2 syntax bullets:

r2-analog—Specifies R2 ITU Q411 analog line signaling, which reflects the on/off switching of a tone in frequency-division multiplexing circuits (before TDM circuits were created). The tone is used for line signaling.

r2-digital—Specifies R2 ITU Q421 digital line signaling, which is the most common signaling configuration. The A and B bits are used for line signaling.

r2-pulse—Specifies R2 ITU supplement 7 pulse line signaling, which is a transmitted pulse that indicates a change in the line state.

r2-compelled [ani]—Specifies R2 compelled register signaling. You can also specify provisioning the ANI address option.

r2-non-compelled [ani]—Specifies R2 noncompelled register signaling.

r2-semi-compelled [ani]—Specifies R2 semicompelled register signaling.

Defaults

No channel-associated signaling is configured on the controller. All R2 signaling types have DNIS turned on by default.

Command Modes Controller configuration

Command History	Release	Modification
	11.3 MA	The command was introduced as the voice-group command on the Cisco MC3810 concentrator.
	12.0(5)XK and 12.0(7)T	The command was implemented on the Cisco 2600 and Cisco 3600 series with a different name and some keyword modifications.
	12.1(2)XH and 12.1(3)T	The command was modified for E1 R2 signaling.
	12.2	The command was modified to exclude sas keywords. The Special Access Station (SAS) CAS options of sas-loop-start and sas-ground-start are not supported as a type of signaling for the DS0 group.

Usage Guidelines Use this command to configure support for incoming and outgoing call signals (such as on-hook and off-hook) on each E1 controller.

If you specify the time-slot range 1-31, the system software automatically uses the sixteenth time slot to transmit the channel-associated signaling.

The signaling you configure on the access server must match the signaling used by the central office. For example, if the central office switch is forwarding R2 analog signaling to a Cisco 2600 or 3600 series router, the E1 controller on the router must also be configured for R2 analog signaling (**r2-analog**).

All R2 signaling options have DNIS support turned on by default. If you enable the **ani** option, the collection of DNIS information is still performed. Specifying the **ani** option does not disable DNIS. DNIS is the number being called. ANI is the caller's number. For example, if you are configuring router A to call router B, the DNIS number is router B and the ANI number is router A. ANI is very similar to Caller ID.

To customize the R2 signaling parameters, refer to the **cas-custom** controller configuration command. When you enable the **ds0-group** command, the **cas-custom** command is automatically set up to be polled for configuration information. However, unless you enable or turn on specific features with the **ds0-custom** command, the cas-custom feature has an empty set of signaling parameters.

DNIS is automatically collected for modem pools and R2 tone signaling. You do not need to specify the collection of DNIS information with the **ds0-group** command. However, if you are using non-R2 tone signaling, the system must be manually configured to collect DNIS information. For non-R2 CAS signaling, DNIS collection is done only for E&M-fgb.

Examples In most cases, you will configure the same channel-associated signaling on each E1 controller. The following examples configure signaling and customized parameters on controller E1 2 using the **ds0-group** and **cas-custom** controller configuration commands.

The actual channel-associated signaling is configured on the sixteenth time slot, which is the reason why this time slot does not come up in the following output.

```
Router(config)# controller e1 2
Router(config-controller)# ds0-group 1 timeslots 1-31 type r2-digital r2-compelled ani
Router(config-controller)#
```

```
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 1 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 2 is up
```

ds0-group (controller e1)

```

%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 3 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 4 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 5 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 6 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 7 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 8 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 9 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 10 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 11 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 12 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 13 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 14 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 15 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 17 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 18 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 19 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 20 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 21 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 22 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 23 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 24 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 25 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 26 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 27 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 28 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 29 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 30 is up
%DSX0-5-RBSLINEUP: RBS of controller 0 timeslot 31 is up

```

The following example shows all the supported E1 signaling types on a Cisco 2600 or 3600 series router.

```
Router(config-controller)# ds0-group 1 timeslots 1-31 type ?
```

```

e&m-fgb          E & M Type II FGB
e&m-fgd          E & M Type II FGD
e&m-immediate-start E & M Immediate Start
fxs-ground-start FXS Ground Start
fxs-loop-start   FXS Loop Start
p7              P7 Switch
r2-analog       R2 ITU Q411
r2-digital      R2 ITU Q421
r2-pulse        R2 ITU Supplement 7

```

```
Router(config-controller)# cas-group 1 timeslots 1-31 type r2-analog ?
```

```

r2-compelled      R2 Compelled Register Signalling
r2-non-compelled  R2 Non Compelled Register Signalling
r2-semi-compelled R2 Semi Compelled Register Signalling
<cr>

```

R2 signaling parameters can be customized with the **cas-custom** controller configuration command:

```
Router(config-controller)# cas-custom 1  
Router(config-ctrl-cas)# ?
```

CAS custom commands:

caller-digits	Digits to be collected before requesting CallerID
category	Category signal
country	Country Name
default	Set a command to its defaults
exit	Exit from cas custom mode
invert-abcd	invert the ABCD bits before tx and after rx
metering	R2 network is sending metering signal
nc-congestion	Non Compelled Congestion signal
no	Negate a command or set its defaults