

# debounce-time rai

To configure a timer that prevents E1 or STM-1 trunk lines from being torn down in response to brief line outages, use the **debounce-time rai** command in controller configuration mode. To restore the default timer value, use the **no** form of this command.

**debounce-time rai** *milliseconds*

**no debounce-time rai** *milliseconds*

## Syntax Description

*milliseconds*

Time, in milliseconds (ms), to wait before tearing down an E1 or STM-1 line after receiving a Receive Alarm Indication (RAI) signal.

### AS5800

- E1 lines—Valid values range from 500 to 7000 ms. The value entered must be a multiple of 50. The default value is 500 ms.

### AS5850

- E1 lines—Valid values range from 1000 to 7000 ms. The value entered must be a multiple of 50. The default value is 1000 ms.
- STM-1 lines—Valid values range from 2000 to 7000 ms. The value entered must be a multiple of 50. The default value is 2000 ms.

## Command Default

The default value for the timer is used:

- E1 lines on the AS5800—500 ms
- E1 lines on the AS5850—1000 ms
- STM-1 lines on the AS5850—2000 ms

## Command Modes

Controller configuration

## Command History

Release	Modification
12.2(2)XB5	This command was introduced on the Cisco AS5800 and the route switch controller (RSC) Cisco AS5850.
12.2(11)T	Support for this command on the Cisco AS5800 and the RSC Cisco AS5850 was integrated into Cisco IOS Release 12.2(11)T.
12.3(7)XI	Support for this command was added for the enhanced RSC (ERSC) Cisco AS5850.
12.3(4)T	Support for the ERSC Cisco AS5850 was integrated into Cisco IOS Release 12.3(4)T.

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**Usage Guidelines**

Use the **debounce-time rai** command to configure a timer that allows Awaiting Info (I) calls to ignore brief trunk outages. When a Receive Alarm Indication (RAI) signal is received, the access server will wait the configured interval before tearing down the line.

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**Examples**

The following example configures an E1 controller to wait for 5250 ms before tearing down an E1 trunk line:

```
Router(config)# controller e1 1/0/0
Router(config-controller)# debounce-time rai 5250
```

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**Related Commands**

Command	Description
<b>controller</b>	Configures a T1, E1, or J1 controller and enters controller configuration mode.

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## default (VPDN)

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

**default** *command*

### Syntax Description

<i>command</i>	The command to be removed or reset from the VPDN group or VPDN subgroup configuration. <a href="#">Table 5</a> lists some of the commands that can be issued with the <b>default</b> command.
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### Command Default

No default behavior or values.

### Command Modes

VPDN group configuration  
VPDN subgroup configuration  
VPDN template configuration

### Command History

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

### Usage Guidelines

Use the **default** command to remove or reset a specific command configuration in a VPDN group, VPDN subgroup, or VPDN template configuration. Issuing **default** *command* is the same as issuing the **no** form of the command specified with the *command* argument.

[Table 5](#) lists some of the commands that can be removed or reset using the **default** command, and the configuration modes that the **default** command must be issued in. Some commands may not be available unless a particular configuration is present on the router.

For a complete list of the commands available for use with the **default** command, use the **default ?** command in the desired configuration mode.

Some commands have required keywords or arguments that must be included in the **default** command statement. You may issue **default** *command* ? to determine what keywords and arguments are required. For complete command syntax, see the command documentation in the *Cisco IOS Dial Technologies Command Reference*.

**Table 5** Command Options for the default (VPDN) Command

Command Name	Configuration Mode
<b>accept-dialin</b>	VPDN group configuration mode.
<b>accept-dialout</b>	VPDN group configuration mode.
<b>authen before-forward</b>	VPDN group configuration mode.
<b>dialer</b>	Accept-dialout VPDN subgroup configuration mode.

Table 5 Command Options for the default (VPDN) Command (continued)

Command Name	Configuration Mode
<b>dnis</b>	Request-dialin VPDN subgroup configuration mode.
<b>domain</b>	Request-dialin VPDN subgroup configuration mode.
<b>force-local-chap</b>	VPDN group configuration mode.
<b>initiate-to</b>	VPDN group configuration mode.
<b>lcp renegotiation</b>	VPDN group configuration mode.
<b>local name</b>	VPDN group configuration mode.
<b>multilink</b>	VPDN group configuration mode.
<b>pool-member</b>	Request-dialout VPDN subgroup configuration mode.
<b>protocol</b>	Any VPDN subgroup configuration mode.
<b>multihop</b>	Request-dialin VPDN subgroup configuration mode.
<b>request-dialin</b>	VPDN group configuration mode.
<b>request-dialout</b>	VPDN group configuration mode.
<b>rotary-group</b>	Request-dialout VPDN subgroup configuration mode.
<b>session-limit</b>	VPDN group configuration mode.
<b>source-ip</b>	VPDN group configuration mode.
<b>terminate-from</b>	VPDN group configuration mode.
<b>virtual-template</b>	Accept-dialin VPDN subgroup configuration mode.

## Examples

The following example shows the running configuration of a tunnel server VPDN group configured to accept Layer 2 Forwarding (L2F) dial-in calls and to place Layer 2 Tunnel Protocol (L2TP) dial-out calls:

```
Router# show running-config
!
vpdn-group group1
  accept-dialin
  protocol l2f
  virtual-template 1
  request-dialout
  protocol l2tp
  pool-member 1
  terminate-from hostname myhost
  initiate-to ip 10.3.2.1
  local name router32
  l2f ignore-mid-sequence
  l2tp ip udp checksum
!
```

If you issue the **default virtual-template** command in accept-dialin VPDN subgroup configuration mode, the **virtual-template** command configuration is removed from the VPDN subgroup:

```
Router(config-vpdn-req-out)# default virtual-template
!
Router# show running-config
!
vpdn-group group1
  accept-dialin
  protocol l2f
```

```

request-dialout
  protocol l2tp
  pool-member 1
terminate-from hostname myhost
initiate-to ip 10.3.2.1
local name router32
l2f ignore-mid-sequence
l2tp ip udp checksum
!
```

If you issue the **default accept-dialin** command in VPDN group configuration mode, the accept-dialin VPDN subgroup configuration is removed from the VPDN group along with all configurations that require an accept-dialin VPDN subgroup:

```

Router(config-vpdn)# default accept-dialin
!
Router# show running-config
!
vpdn-group group1
  request dialout
  protocol l2tp
  pool-member 1
  local name router32
  initiate-to ip 10.3.2.1
  l2tp ip udp checksum
```

The following example enters VPDN template configuration mode and uses the command line help system to find the commands available to use with the **default** command:

```

Router(config)# vpdn-template 1
Router(config-vpdn-templ)# default ?

  description  Description for this VPDN group
  group        Items grouped for all attached vpdn-groups
  ip           IP settings for tunnel
  l2f         L2F specific commands
  l2tp        L2TP specific commands
  local       Local information
  pptp       PPTP specific commands
  redirect    Call redirection options
  relay       Relay options configuration
  vpn        VPN ID/VRF name
```

The following example uses the command line help system to show that a value must be entered for the *number* argument when the **default session-limit** command is issued in VPDN group configuration mode:

```

Router(config-vpdn)# default session-limit ?

<0-32767> Max number of sessions
```

#### Related Commands

Command	Description
<b>accept-dialin</b>	Creates an accept dial-in VPDN subgroup that configures a tunnel server to accept requests from a NAS to tunnel dial-in calls, and enters accept-dialin VPDN subgroup configuration mode.
<b>accept-dialout</b>	Creates an accept dial-out VPDN subgroup that configures a NAS to accept requests from a tunnel server to tunnel L2TP dial-out calls, and enters accept-dialout VPDN subgroup configuration mode.

Command	Description
<b>request-dialin</b>	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-dialin VPDN subgroup configuration mode.
<b>request-dialout</b>	Creates a request dial-out VPDN subgroup that configures a tunnel server to request the establishment of dial-out L2TP tunnels to a NAS, and enters request-dialout VPDN subgroup configuration mode.
<b>vpdn-group</b>	Creates a VPDN group and enters VPDN group configuration mode.
<b>vpdn-template</b>	Enters VPDN template configuration mode, where a template for VPDN groups can be configured.

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

## description (VPDN group)

To add a description to a virtual private dialup network (VPDN) group, use the **description** command in VPDN group or VPDN template configuration mode. To remove the description, use the **no** form of this command.

**description** *string*

**no description**

<b>Syntax Description</b>	<i>string</i>	Comment or a description about the VPDN group.
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<b>Command Default</b>	No description is associated with the VPDN group.	
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<b>Command Modes</b>	VPDN group configuration VPDN template configuration	
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2	This command was introduced.

<b>Examples</b>	The following example shows how to enter a description for a VPDN group:
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```
vpdn-group 333
description This is a VPDN group at location 333
request-dialin
protocol l2tp
domain cisco2.com
exit
initiate-to ip 10.0.0.63
local name cisco.com
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>vpdn-group</b>	Creates a VPDN group and enters VPDN group configuration mode.
	<b>vpdn-template</b>	Creates a VPDN template and enters VPDN template configuration mode.

# 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**

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

<b>Usage Guidelines</b>	<p>You must first enable Layer 2 Tunneling Protocol (L2TP) on the accept-dialout VPDN subgroup by using the <b>protocol l2tp</b> command before you can enable the <b>dialer</b> command. Removing the <b>protocol</b> command will remove the <b>dialer</b> 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.

<b>Examples</b>	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
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>accept-dialout</b>	Accepts requests to tunnel L2TP dial-out calls and creates an accept-dialout VPDN subgroup.
	<b>protocol (VPDN)</b>	Specifies the L2TP that the VPDN subgroup will use.
	<b>terminate-from</b>	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

Command History	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
	<b>dialer callback-server</b>	Enables an interface to make return calls when callback is successfully negotiated.
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	<b>map-class dialer</b>	Defines a class of shared configuration parameters associated with the <b>dialer map</b> command for outgoing calls from an ISDN interface and for PPP callback.
	<b>ppp callback (DDR)</b>	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	Parameter	Description
	<b>username</b>	(Optional) Looks up the authenticated host name in a <b>dialer map</b> command. This is the default.
	<b>dialstring</b>	(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
	<b>dialer callback-secure</b>	Enables callback security.
	<b>dialer enable-timeout</b>	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.
	<b>dialer hold-queue</b>	Allows interesting outgoing packets to be queued until a modem connection is established.
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.

Command	Description
<b>map-class dialer</b>	Defines a class of shared configuration parameters associated with the dialer map command for outgoing calls from an ISDN interface and for PPP callback.
<b>ppp callback (DDR)</b>	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*

<b>Syntax Description</b>	<i>DNIS:subaddress</i> Dialed Number Identification Service or the called party number, a colon, and the ISDN subaddress.	
<b>Defaults</b>	No default behavior or values.	
<b>Command Modes</b>	Dial-on-demand routing configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(4)T	This command was introduced.
<b>Usage Guidelines</b>	<p>If you have more than one DNIS-plus-ISDN-subaddress number to configure under the same dialer profile interface, you can configure multiple <b>dialer called</b> commands.</p> <p>The parser accepts a <b>dialer called</b> 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 <b>dialer called</b> command.</p>	
<b>Examples</b>	<p>The following example configures a dialer profile for a receiver with DNIS 12345 and ISDN subaddress 6789:</p> <pre>dialer called 12345:6789</pre>	
<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>dialer caller</b>	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.
<b>callback</b>	(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
<b>isdn caller</b>	Configures ISDN caller ID screening and, optionally, enables ISDN caller ID callback for legacy DDR.
<b>show dialer</b>	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
```

## Related Commands

Command	Description
<b>number</b>	Adds a DNIS number to a dialer DNIS group.
<b>resource-pool call treatment discriminator</b>	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**

<b>Syntax Description</b>	<i>links</i>	Number of connected links for congestion threshold in the range from 0 to 64,000.
<b>Defaults</b>	The default number of connected links is 64,000.	
<b>Command Modes</b>	Interface configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(3)T	This command was introduced.
<b>Usage Guidelines</b>	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).	
<b>Examples</b>	The following example sets the congestion threshold to five connected links on the Dialer interface 0: <pre>interface Dialer0   dialer aaa   dialer congestion-threshold 5</pre>	
<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>dialer reserved-links</b>	Reserves links for dial-in and dial-out.
	<b>sgbp dial-bids</b>	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
<b>dnis group</b>	Includes a group of DNIS numbers in a customer profile.
<b>resource-pool profile</b>	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
	<b>dialer aaa</b>	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) signaling 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:

```
Router(config-if)# dialer dtr
```

Related Commands	Command	Description
	<b>dialer in-band</b>	Specifies that DDR is to be supported.
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	<b>dialer string (legacy DDR)</b>	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**

<b>Syntax Description</b>	<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 <b>pulse-time</b> command.
---------------------------	----------------	---

<b>Defaults</b>	15 seconds
-----------------	------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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**

<b>Syntax Description</b>	<i>seconds</i>	Idle time, in seconds, that must occur on an interface before the line is disconnected. Acceptable values are positive, nonzero integers.
---------------------------	----------------	---

<b>Defaults</b>	20 seconds
-----------------	------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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**

<b>Command</b>	<b>Description</b>
<b>dialer idle-timeout (interface)</b>	Specifies the idle time before the line is disconnected.
<b>dialer map</b>	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.
----------------	--

## 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
<b>dialer idle-timeout (interface)</b>	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.
<b>dialer wait-for-carrier-time (map-class)</b>	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
<b>map-class dialer</b>	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**

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

<b>Defaults</b>	No access is predefined.
-----------------	--------------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<table border="1"> <thead> <tr> <th style="border-right: none;">Release</th> <th style="border-left: none;">Modification</th> </tr> </thead> <tbody> <tr> <td style="border-right: none;">10.0</td> <td style="border-left: none;">This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	10.0	This command was introduced.
Release	Modification				
10.0	This command was introduced.				

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

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

<b>Examples</b>	<p>The following example specifies dialer access group number 1.</p> <p>The destination address of the packet is evaluated against the access list specified in the associated <b>dialer-list</b> 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).</p>
-----------------	--

```
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
```

<b>Related Commands</b>	<table border="1"> <thead> <tr> <th style="border-right: none;">Command</th> <th style="border-left: none;">Description</th> </tr> </thead> <tbody> <tr> <td style="border-right: none;"><b>dialer-list protocol (Dial)</b></td> <td style="border-left: none;">Defines a DDR dialer list to control dialing by protocol or by a combination of protocol and an access list.</td> </tr> </tbody> </table>	Command	Description	<b>dialer-list protocol (Dial)</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of protocol and an access list.
Command	Description				
<b>dialer-list protocol (Dial)</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of protocol and an access list.				

# dialer-group (template)

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

**dialer-group** *dialer-list-number*

**no dialer-group**

<b>Syntax Description</b>	<i>dialer-list-number</i>	Number of the dialer access group to which the specific interface belongs. This access group is defined with the <b>dialer-list</b> command. Acceptable values are positive numbers from 1 to 128.
---------------------------	---------------------------	--

<b>Defaults</b>	No access is predefined.
-----------------	--------------------------

<b>Command Modes</b>	Template configuration
----------------------	------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(4)T	This command was introduced for Resource Pool Manager (RPM) template configuration.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and support was added for the Cisco AS5300, Cisco AS5400 and Cisco AS5800.	

**Usage Guidelines**

An interface can be associated with only a single dialer access group; 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** template configuration command. The **dialer-list** command associates an access list with a dialer access group. For Cisco IOS Release 12.2(4)T, the number of dialer groups that can be configured was increased from 10 to 128.

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).

```
template template1
dialer-group 1
```

Related Commands	Command	Description
	<b>dialer-list protocol</b>	Defines a 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 from 1 to 100 packets, to hold in the queue. This argument is optional with the <b>no</b> form of this command.
<b>timeout</b> <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:

```
Router(config-if)# dialer hold-queue 10 timeout 60
```

## Related Commands

Command	Description
<b>dialer-group</b>	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.
	<b>inbound</b>	(Optional) Only inbound traffic will reset the idle timeout.
	<b>either</b>	(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"> <li>• <b>inbound</b></li> <li>• <b>either</b></li> </ul>

Usage Guidelines	
	<p>This command is used on lines for which there is no contention. When contention occurs, the <b>dialer fast-idle</b> 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 <b>dialer fast-idle</b> command is activated.</p> <p>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.</p> <p>Only packets that match the dialer group reset the idle timer.</p> <p>Use the <b>dialer idle-timeout</b> command to set a very high idle timer when Multilink PPP is configured and you want a multilink bundle to be connected indefinitely. (The <b>dialer-load threshold 1</b> command no longer keeps a multilink bundle of n links connected indefinitely and the <b>dialer-load threshold</b> command no longer keeps a multilink bundle of two links connected indefinitely.)</p>

---

**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
<b>dialer fast-idle (interface)</b>	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.
<b>dialer-group</b>	Controls access by configuring an interface to belong to a specific dialing group.

# dialer idle-timeout (template)

To set the dialer idle timeout period in a virtual template interface, use the **dialer idle-timeout** command in template configuration mode. To change the dialer idle timeout, use the **no** form of this command.

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

**no dialer idle-timeout** *seconds* [**inbound** | **either**]

Syntax Description		
	<i>seconds</i>	Resets the idle timer after the period specified, in seconds.
	<b>inbound</b>	(Optional) Resets the idle timer after the period specified based only on inbound traffic.
	<b>either</b>	(Optional) Resets the idle timer after the period specified based on either inbound or outbound traffic.

**Defaults** No default behavior or values.

**Command Modes** Template configuration

Command History	Release	Modification
	12.2(4)T	This command was introduced for Resource Pool Manager (RPM) template configuration.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and support was added for the Cisco AS5300, Cisco AS5400 and Cisco AS5800.

**Usage Guidelines** The **dialer idle-timeout** command allows the dialer idle timeout period to be specified in an RPM customer profile and applied on a per-dialed number identification service (DNIS) basis. The dialer idle timer configuration set in this command will override dialer idle timer configurations for dialer, group asynchronous, and virtual template interfaces, unless a per-user configuration is received from an authentication, authorization, and accounting (AAA) per-user interface configuration. In this case, the settings from the AAA per-user interface configuration take precedence over the local interface configuration.

The **dialer idle-timeout** command works well with Multilink PPP (MLP) and Multichassis Multilink PPP (MMP) when the master bundle interface is not a virtual access (projected) interface. For virtual access interfaces where the dialer idle timer cannot be used, you can classify traffic that resets the PPP idle timer using the **ip idle-group** commands.

**Examples** The following example sets the idle timeout period in an RPM customer profile template to 45 seconds:

```
template template 1
dialer idle-timeout 45
```

**dialer idle-timeout (template)**

The following example sets the idle timeout period in an RPM customer profile template to 60 seconds and resets the idle timer based on either inbound or outbound traffic:

```
template template 1
dialer idle-timeout 60 either
```

The following example sets the idle timeout period in an RPM customer profile template to 100 seconds and resets the idle timer based only on inbound traffic:

```
template template 1
dialer idle-timeout 100 inbound
```

**Related Commands**

Command	Description
<b>dialer-group (template)</b>	Controls access by configuring a virtual template interface to belong to a specific dialing group.
<b>ip idle-group</b>	Configures interesting traffic on an interface for the PPP idle timer.
<b>template</b>	Accesses the template configuration mode for configuring a particular customer profile template.

# 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	
<b>no-parity</b>	(Optional) No parity is to be applied to the dialer string that is sent out to the modem on synchronous interfaces.
<b>odd-parity</b>	(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
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	<b>dialer string (legacy DDR)</b>	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

<b>speed</b> <i>speed</i>	(Optional) Bit rate, in kilobytes per second (kbps), used on the ISDN B channel. Values are <b>56</b> and <b>64</b> . Defaults is 64.
<b>spc</b>	(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
<b>dialer wait-for-carrier-time</b> ( <b>map-class</b> )	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**

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

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

<b>Command Modes</b>	Map-class dialer configuration
----------------------	--------------------------------

<b>Command History</b>	Release	Modification
	11.3	This command was introduced.

<b>Usage Guidelines</b>	<p>This command is used for configuring ISDN Advice of Charge (AOC) on Cisco routers.</p> <p>Use the <b>dialer isdn short-hold</b> 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>
-------------------------	---

<b>Examples</b>	<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
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites, or to receive calls from multiple sites.
	<b>dialer string (dialer profiles)</b>	Specifies the string (telephone number) to be used when placing a call from an interface.
	<b>dialer wait-for-carrier-time (map-class)</b>	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
	<b>map-class dialer</b>	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 (Dial)

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 <b>dialer-group</b> interface or template configuration command. Up to 128 dialer groups can be configured.	
<i>protocol-name</i>	One of the following protocol keywords: <b>appletalk</b> , <b>bridge</b> , <b>clns</b> , <b>clns_es</b> , <b>clns_is</b> , <b>decnet</b> , <b>decnet_router-L1</b> , <b>decnet_router-L2</b> , <b>decnet_node</b> , <b>ip</b> , <b>ipx</b> , or <b>ipv6</b> .	
<b>permit</b>	Permits access to an entire protocol.	
<b>deny</b>	Denies access to an entire protocol.	
<b>list</b>	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, IP, or Novell IPX standard or extended access lists, including Novell IPX extended service access point (SAP) access lists and bridging types. See <a href="#">Table 6</a> for the supported access list types and numbers.	
<i>access-group</i>	Filter list name used in the <b>clns filter-set</b> and <b>clns access-group</b> commands.	

**Defaults** No dialer lists are defined.

**Command Modes** Global configuration

Command History	Release	Modification
	10.0	This command was introduced.
	10.3	The <b>list</b> keyword and the <i>access-list-number</i> and <i>access-group</i> arguments were added.
	12.2(2)T	The <b>ipv6</b> protocol keyword was added.
	12.2(4)T	The number of dialer groups that can be configured was increased to 128.
	12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and support was added for the Cisco AS5300, Cisco AS5400, and Cisco AS5800.
	12.2(13)T	The <b>igrp</b> , <b>vines</b> , and <b>xns</b> arguments were removed because the Interior Gateway Routing Protocol (IGRP), Banyan Systems Virtual Integrated Network Service (VINES), and the Xerox Network System (XNS) are no longer available in Cisco IOS software.

**Usage Guidelines**

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

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

The **dialer-list protocol** command permits or denies access to an entire protocol.

The **dialer-list protocol** command with the optional **list** keyword provides finer permission granularity and also supports protocols that were not previously supported. This command also 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 6 lists the access list types and numbers that the **dialer-list protocol** command supports. The table does not include International Organization for Standardization Connectionless Network Service (ISO CLNS) because that protocol uses filter names instead of predefined access list numbers.

**Table 6** *dialer-list protocol Command Supported Access List Types and Numbers*

Access List Type	Access List Number Range (Decimal)
AppleTalk	600–699
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

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

```
access-list 101 permit ip 10.0.0.0 255.255.255.255 10.0.0.0 255.255.255.255
```

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, a 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
```

The following example configures an IPv6 access list named list2 and places the access list in dialer access group 1:

```
ipv6 access-list list2 deny fec0:0:0:2::/64 any
ipv6 access-list list2 permit any any
!
dialer-list 1 protocol ipv6 list list2
```

#### Related Commands

Command	Description
<b>access-list</b>	Configures the access list mechanism for filtering frames by protocol type or vendor code.
<b>clns filter-set</b>	Builds a list of CLNS address templates with associated permit and deny conditions for use in CLNS filter expressions.
<b>dialer-group (template)</b>	Controls access by configuring a virtual template interface to belong to a specific dialing group.
<b>ipv6 access-list</b>	Defines an IPv6 access list and sets deny or permit conditions for the defined 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.
<b>outbound</b>	(Optional) Calculates the actual load using outbound data only.
<b>inbound</b>	(Optional) Calculates the actual load using inbound data only.
<b>either</b>	(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
<b>bandwidth</b>	Specifies the maximum aggregate bandwidth for H.323 traffic.
<b>busyout</b>	Creates a “host-failed” message that displays when a connection fails.
<b>dialer max-call</b>	Specifies the maximum number of calls to a remote destination that can be up at any one time for a dialer profile.
<b>dialer pool-member max-links</b>	Configures a physical interface to be a member of a dialer profile dialing pool.
<b>dialer reserved-links</b>	Includes a specified interface in a dialer rotary group.
<b>interface dialer</b>	Defines a dialer rotary group.

# dialer map

To configure a serial or ISDN interface to call multiple sites or to receive calls from multiple sites, use the **dialer map** command in interface configuration mode. Several options for using this command are possible; see the following description and the “Examples” section. To delete a particular dialer map entry, use the **no** form of this command.

## Complete Syntax

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

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

## Dialer Map for an Asynchronous Interface

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 following form of the **dialer map** interface configuration command:

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

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

## Dialer Map for ISDN Interface and ISDN AOC Short-Hold Idle Timeout

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** interface configuration command:

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

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

## Dialer Map for German and Australian SPC

The following command syntax is 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. To set up network addressing on an ISDN BRI interface to support semipermanent connection between customer equipment and the exchange, use the following form of the **dialer map** interface configuration command:

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

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

#### Dialer Map for MPLS VPN

To configure a serial or ISDN interface to support an IP-based VPN routing and forwarding instance (VFR)-aware dialer map for a Multiprotocol Label Switching (MPLS) VPN, use the following form of the **dialer map** interface configuration command:

**dialer map ip** *protocol-next-hop-address vrf vrf-name name host-name dial-string*

**no dialer map ip** *protocol-next-hop-address vrf vrf-name name host-name dial-string*

#### Dialer Map for Bridging

To configure a serial or ISDN interface to support bridging, use the following form of the **dialer map** interface configuration command:

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

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

#### Syntax Description

<i>protocol-keyword</i>	Enter one of the protocol keywords listed followed by an appropriate address (for example, the <b>clns</b> keyword is followed by a network service access point, or NSAP, address):
<i>protocol-next-hop-address</i>	<ul style="list-style-type: none"> <li>• <b>appletalk</b>—AppleTalk</li> <li>• <b>bridge</b>—Bridging (no address is required)</li> <li>• <b>clns</b>—Cisco IOS Connectionless Network Service (CLNS)</li> <li>• <b>decnet</b>—DECnet</li> <li>• <b>hpr</b>—High Performance Routing</li> <li>• <b>ip</b>—IP</li> <li>• <b>ipx</b>—Internetwork Packet Exchange</li> <li>• <b>llc2</b>—Logical Link Control, type 2</li> <li>• <b>netbios</b>—NetBIOS</li> <li>• <b>pppoe</b>—PPP over Ethernet</li> <li>• <b>snapshot</b>—Snapshot routing protocol; refer to the <b>dialer map snapshot</b> command description for use of this keyword</li> </ul>
<b>broadcast</b>	(Optional) Forwards broadcasts to the address specified with the <i>protocol-next-hop-address</i> argument.
<b>class</b> <i>dialer-map-class-name</i>	(Optional) Dialer map class name.
<b>modem-script</b> <i>modem-regular-expression</i>	(Optional) Modem script name to be used for the connection (asynchronous interfaces only).
<b>vrf</b> <i>vrf-name</i>	(Optional) VPN routing/forwarding instance (VRF) for use with a VRF-aware dialer map in an MPLS VPN. Provide a dial string after the VRF name.

<b>name</b> <i>host-name</i>	(Optional) The remote system with which the local router or access server communicates. Used for authenticating the remote system on incoming calls. The <i>host-name</i> argument is a case-sensitive name or ID of the remote device. 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> argument can contain the number that the calling line ID provides.
<b>spc</b>	(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.
<b>speed 56</b>   <b>speed 64</b>	(Optional) Keyword and value indicating the line speed in kbps to use. Used for ISDN only. The default speed is <b>speed 64</b> (64 kbps).
<b>system-script</b> <i>system-regular-expression</i>	(Optional) System script name to be used for the connection (asynchronous interfaces only).
<i>dial-string[:isdn-subaddress]</i>	(Optional) Dial string (telephone number) sent to the dialing device when it recognizes packets with the specified address that matches the configured access lists, and the optional subaddress number used for ISDN multipoint connections (colon required for separating numbers). The dial string and ISDN subaddress, when used, must be the last item in the command line.

**Defaults**

For all forms of the command, 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
9.1	This command was introduced for synchronous serial interfaces using V.25bis dialing.
10.0	This command was enhanced to support asynchronous and ISDN interfaces.
11.3	This command was enhanced to support ISDN AOC.
12.2(8)T	The <b>vrf</b> <i>vrf-name</i> keyword and argument were added.
12.2(13)T	The <b>vines</b> and <b>xns</b> arguments were removed because Banyan Systems' Virtual Integrated Network Service (VINES) and the Xerox Network System (XNS) are no longer available in Cisco IOS software.

## Usage Guidelines

### Usage Guidelines for Asynchronous Interfaces

Configure a **dialer map** command for each remote destination for an asynchronous interface. Specify chat scripts for a physical interface that is not part of a dialer rotary group when no chat script is specified for the line, or when a system chat script is required to log in to the remote system. However, you need *not* specify a system script under the following conditions:

- The modem script can be used to dial in and log in 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, refer to the “Regular Expressions” appendix in the *Cisco IOS Dial Technologies Configuration Guide*.

If a modem script is specified in the **dialer map** interface configuration command and a modem script is 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 regular expression of the modem script 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 to which you want to connect using V.32bis modulation.

The modem lines (specified by the *regular-expression* argument 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-.\***

### 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 send 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 send packets to the remote site. Because no dialer string is specified, the central site cannot call the remote router.

### Usage Guidelines for ISDN Interfaces and ISDN AOC

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 send the remote site 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 send packets to the remote site. Because no dialer string is 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 CLI is provided, the *host-name* field may contain the number that calling line ID provides.

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

### Usage Guidelines for MPLS VPN

Beginning with Cisco IOS Release 12.2(8)T, dialer software became capable of being “VRF-aware for MPLS VPN,” meaning that it can distinguish between two destinations with the same IP address using information stored in a VRF. When the **dialer map** command is configured with the **vrf** keyword in an MPLS VPN, the dialer software looks up a map for the next hop address using the next hop address and the VRF name configured. Once dial-out takes place and authentication is complete, a virtual profile interface is created. The VRF is installed on the virtual profile interface using the following per-user authentication, authorization, and accounting (AAA) interface command:

```
cisco-avpair "lcp:interface-config=ip vrf forwarding vrf-name"
```

Data transfer occurs as defined by the virtual profile dialer. When an IP route for a particular VRF points to the dialer (configured using the **ip route** global configuration command), the dialer uses the VRF-aware dialer map to get the dial string and IP address, and to bring up the connection. Once the user is authenticated, a virtual access interface is created and the user details are downloaded from the AAA server, and finally, the appropriate IP VRF command is applied on the virtual access interface.

## Examples

### Asynchronous Interface 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 dial-on-demand routing (DDR) on asynchronous interface 10, and the **dialer map** command looks for the specified dialing and the login scripts, then uses those scripts to dial the string 95550190.

```
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 95550190
```

In the following example, the remote site is calling the central site, and the central site is calling the remote site. The central router uses the name *ZZZ* to authenticate the remote router when connection is made, and uses the dialer string 14155550134 to call the remote router if it is not currently connected.

```
interface async 1
dialer map ip 172.19.2.5 name ZZZ 14155550134
```

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 causes the remote site name, *YYY*, to be sent 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
```

### ISDN AOC Short-Hold Idle Timeout Example

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 IA password 7 1533121F0725
username IB password 7 110A1016262D29
username IC password 7 1533121F072508
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 IA class One 06966600050
  dialer map ip 10.0.0.40 name IB class Two 778578
  dialer map ip 10.0.0.45 name IC class Three 778579
  ppp authentication chap
!
map-class dialer Three
  dialer idle-timeout 300
  dialer isdn short-hold 10
!
map-class dialer One
  dialer idle-timeout 300
!
map-class dialer Two
  dialer idle-timeout 300
  dialer isdn short-hold 10
```

### SPC Example

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 49305550155:3789
```

### MPLS VPN Example

In the following partial example, the number to be dialed is based on the VRF name and destination IP address configured. The VRF is identified based on the incoming interface of the packet, and is used with the destination IP address to determine the number to be dialed, as defined in the **dialer map** command.



#### Note

The **virtual-profile aaa** command is required only if you are using a Cisco IOS Release prior to 12.2(8)T. Effective with Cisco Release 12.2(8)T and above, the support for the **virtual-profile aaa** command is not available in Cisco IOS Software.

```
virtual-profile virtual-template 1
virtual-profile aaa
!
interface virtual-template 1
 ip unnumbered loopback0
 ppp authentication chap
 ppp multilink
.
.
.
interface dialer 1
 dialer map ip 10.9.9.9 vrf new_vrf name new_name 5550145
 dialer map ip 10.9.9.9 vrf branch_vrf name branch_name 5550156
 ppp authentication chap
 ppp multilink
.
.
.
ip route vrf vrfgreen_vrf 10.9.9.9 255.255.255.255 dialer1
ip route vrf vrfyellow_vrf 10.9.9.9 255.255.255.255 dialer1
```

#### Related Commands

Command	Description
<b>chat-script</b>	Places calls over a modem and logs in to remote systems.
<b>dialer idle-timeout (map-class)</b>	Specifies the fast idle timer value to use when placing a call to any telephone number associated with a specified class.
<b>dialer isdn short-hold</b>	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.
<b>dialer map snapshot</b>	Defines a dialer map for the snapshot routing protocol on a client router connected to a DDR interface.
<b>ip route</b>	Establishes static IP routes, and pairs an IP address with a VRF-aware dialer map.
<b>map-class dialer</b>	Defines a class of shared configuration parameters associated with the <b>dialer map</b> command for outgoing calls from an ISDN interface and for PPP callback.
<b>ppp bap call</b>	Sets PPP BACP call parameters.

# 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 <b>no</b> 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**

<b>Command</b>	<b>Description</b>
<b>dialer reserved-links</b>	Includes a specified interface in a dialer rotary group.
<b>interface dialer</b>	Defines a dialer rotary group.
<b>snapshot client</b>	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*

<b>Syntax Description</b>	<i>number</i>	Maximum number of calls, ranging from 1 to 4096.
---------------------------	---------------	--

<b>Defaults</b>	No maximum number of calls is specified.
-----------------	--

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

<b>Usage Guidelines</b>	The <b>dialer max-calls</b> 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.

<b>Examples</b>	The following example sets a maximum of six calls:
-----------------	--

```
dialer max-call 6
```

Related Commands	Command	Description
	<b>dialer isdn</b>	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.
	<b>dialer load-threshold</b>	Configures bandwidth on demand by setting the maximum load before the dialer places another call to a destination.
	<b>dialer pool</b>	Specifies, for a dialer interface, which dialing pool to use to connect to a specific destination subnetwork.
	<b>dialer pool-member max-links</b>	Configures a physical interface to be a member of a dialer profile dialing pool.
	<b>dialer wait-for-carrier-time (map-class)</b>	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.

# dialer order

To specify the dialing order when multiple dial strings are configured, use the **dialer order** command in interface configuration mode. To change or remove the dialing order, use the **no** form of this command.

**dialer order** [**sequential** | **round-robin** | **last-successful**]

**no dialer order** [**sequential** | **round-robin** | **last-successful**]

## Syntax Description

<b>sequential</b>	(Optional) Always starts dialing the first dial string configured in a list of multiple strings, and continues to the next dial string when a call fails. This keyword allows dial string order to be prioritized, and is the default.
<b>round-robin</b>	(Optional) Always starts dialing using the dial string that follows the most recently used dial string. If no calls have previously been made, the dialer uses the first dial string. When a call fails, the dialer tries the next dial string until all dial strings have been tried. This keyword allows calls to be shared equally among the configured dial strings. However, if the dial strings are associated with multiple ISDN B channels on the same remote device, a call may be placed to bring up a second B channel without trying to call the number associated with the first B channel.
<b>last-successful</b>	(Optional) Always starts dialing using the most recently successful dial string, and continues to the next dial string in a list when a call fails. This keyword reduces the time needed to find a dial string that successfully completes a call when the dial strings are not likely to be equally successful.

## Defaults

Dial order is sequential.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2(8)T	This command was introduced.

## Usage Guidelines

The **dialer order** command keywords can be configured on a per-interface basis. The configuration rules are as follows:

- The keyword you configure applies to dial strings configured on an interface by the **dialer map** and **dialer string** configuration commands.
- The keyword you configure for a dialer interface is effective for all destinations defined by that interface.

You can use the **dialer order** command in configurations that apply to both legacy dialers and dialer profiles. The command is also compatible with the following dialer features and protocols:

- Dialer redial
- Dialer Watch feature

- Dialer Persistent feature
- Bandwidth Allocation Control Protocol (BACP)
- Bandwidth on demand
- Multilink PPP

## Examples

The following legacy dialer configuration shows how to set the dialing software to try the telephone number of the last successful call when starting a new call, rather than the first telephone number in the list (555-4004):

```
interface Serial0/0
 ip address 10.2.1.130 255.255.255.0
 encapsulation ppp
 dialer in-band
 dialer map ip 10.2.1.131 name jones1 modem-script scr-3 5554004
 dialer map ip 10.2.1.131 name jones1 modem-script scr-3 5554005
 dialer map ip 10.2.1.131 name jones1 modem-script scr-3 5554006
 dialer-group 1
 dialer order last-successful
```

If in a previous attempt to dial network 10.2.1.131 the telephone number 555-4006 was successful, because the dial order is set to **last-successful**, the next attempt to dial network 10.2.1.131 will start again with the 555-4006 telephone number.

The following dialer profile configuration shows how to set the dialing software to try the telephone number that occurs after the most recently used dial string when starting a new call, rather than the first telephone number in the list (1904):

```
interface Dialer0
 ip address 10.1.1.130 255.255.255.0
 encapsulation ppp
 dialer pool 1
 dialer string 1904
 dialer string 1905
 dialer string 1906
 dialer string 1907
 dialer-group 1
 dialer order round-robin
```

If in a previous attempt to dial network 10.1.1.130 the telephone number 1906 was successful, because the dial order is set to **round-robin**, the next attempt to dial network 10.1.1.130 will start with the 1907 telephone number.

## Related Commands

Command	Description
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites, or to receive calls from multiple sites.
<b>dialer string</b>	Specifies the string (telephone number) to be used when placing a call from an interface.

# 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*

<b>Syntax Description</b>	<i>class-name</i>	Keyword for a specified AT&T Primary-4ESS NSF dialing plan. The following keywords are supported: <b>sdn</b> , <b>megacomm</b> , and <b>accunet</b> .
---------------------------	-------------------	---

<b>Defaults</b>	This command is disabled; no class name is provided.
-----------------	--

<b>Command Modes</b>	Map-class dialer configuration
----------------------	--------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.0	This command was introduced.

<b>Usage Guidelines</b>	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.
-------------------------	--

<b>Examples</b>	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 <b>map-class dialer</b> command.
-----------------	---

```
dialer outgoing sdn
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	<b>dialer voice-call</b>	Configures the dialer map class for an NSF dialing plan to support outgoing voice calls.
	<b>isdn nsf-service</b>	Configures NSF on an ISDN PRI for outgoing calls configured as voice calls.
	<b>map-class dialer</b>	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 persistent

To force a dialer interface to be connected at all times, even in the absence of interesting traffic, use the **dialer persistent** command in interface configuration mode. To disable this option, use the **no** form of this command.

**dialer persistent** [**delay** [**initial**] *seconds* | **max-attempts** *number*]

**no dialer persistent**

## Syntax Description

<b>delay</b>	(Optional) Sets the delay before an attempt to reestablish a persistent connection after a network error has disrupted it.
<b>initial</b>	(Optional) Sets the delay before a persistent connection is established, after configuration or boot-up, in the absence of interesting traffic.
<i>seconds</i>	(Optional) Sets the time, in seconds, for the delay or initial delay set by the <b>delay</b> and <b>initial</b> keywords. Default is 1 second.
<b>max-attempts</b> <i>number</i>	(Optional) Maximum number of attempts for reconnecting after a network error has disrupted the persistent connection. There is no default or limit to the number of attempts.

## Defaults

No persistent connections are established. The default delay and initial delay interval is 1 second. There is no default or limit to the number of reconnection attempts.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.2(4)T	This command was introduced.
12.2(11)T	This feature was implemented on Cisco access server platforms.

## Usage Guidelines

Do not use the **dialer redial** command when a dialer profile has been configured with the **dialer persistent** command. Both these configuration commands prompt the router to dial out, so it is desirable to configure only one of them.

Do not use the **dialer idle-timeout** interface configuration command when a dialer profile has been configured with the **dialer persistent** command. Doing so has no effect on the idle timer, which is overridden by the **dialer idle-timeout** command as **dialer idle-timeout 0**.

You can use the **clear interface EXEC** command on the dialer interface to clear unsuccessful dial attempts on a line without interesting traffic; the dialer software continues attempting to bring up the connection as persistent. To disconnect a persistent connection and prevent the software from attempting more dialing, use the **shutdown** interface configuration command.

Once a connection has been brought up as persistent, it cannot be torn down due to a fast-idle timeout.

**Examples**

The following example shows how to configure a dialer interface for dialer persistent:

```
!
interface dialer 0
 ip address 10.1.1.2 255.255.255.0
 encapsulation ppp
 dialer string 5550189
 dialer pool 1
 dialer-group 1
 dialer persistent delay initial 20
!
access-list 101 permit icmp any any
access-list 101 deny ip any any
dialer-list 1 protocol ip list 101
```

**Related Commands**

Command	Description
<b>dialer-group</b>	Controls access by configuring an interface to belong to a specific dialing group.
<b>dialer-list protocol</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list.
<b>dialer pool</b>	Specifies for a dialer interface which dialing pool to use to connect to a specific destination subnetwork.
<b>dialer redial</b>	Configures redial after failed outbound dial attempts.
<b>dialer string (dialer profiles)</b>	Specifies the string (telephone number) to be used when placing a call from an interface.

# 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

*number* 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
	<b>dialer pool-member</b>	Configures a physical interface to be a member of a dialer profiles dialing pool.
	<b>dialer wait-for-carrier-time (map-class)</b>	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

<b>number</b>	Dialing pool number, in the range 1 through 255.
<b>priority</b> <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.
<b>min-link</b> <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.
<b>max-link</b> <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
<b>dialer pool</b>	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**

<b>Syntax Description</b>	<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.
---------------------------	---------------	---

<b>Defaults</b>	No priority is predefined. When priority is defined, the default value is 0.
-----------------	--

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	10.0	This command was introduced.

<b>Usage Guidelines</b>	<p>This command is meaningful only for interfaces that are part of dialer rotary groups.</p> <p>The value 0 indicates the lowest priority, and 255 indicates the highest priority. The <b>dialer priority</b> command controls which interfaces within a dialer rotary group will be used first. Higher priority interfaces (configured with higher <i>n</i> value) are used first.</p> <p>The <b>dialer priority</b> 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.</p> <p>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.</p>
-------------------------	--

<b>Examples</b>	<p>In the following example, asynchronous interface 3 will be used after interfaces with higher priority and before interfaces with lower priority:</p>
-----------------	---

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

Related Commands	Command	Description
	<b>dialer reserved-links</b>	Includes a specified interface in a dialer rotary group.
	<b>interface dialer</b>	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** *interval-time* **attempts** *redials* [**re-enable** *disable-time*]

**no dialer redial**

Syntax Description	
<b>interval</b> <i>interval-time</i>	Time, in seconds, between redial attempts. The time can range from 5 to 2147483 seconds.
<b>attempts</b> <i>redials</i>	The maximum number of redial attempts to be performed. The number can range from 0 to 2147483.
<b>re-enable</b> <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** Redial timer disabled.

**Command Modes** Interface configuration

Command History	Release	Modification
	12.1(2)	This command was introduced.
	12.2(4)T	This command was modified to allow the following: <ul style="list-style-type: none"> <li>• A disable time can be applied to a dialer profile interface and to a serial dialer.</li> <li>• The dialer can be configured to apply a disable timer without performing any redial attempts.</li> <li>• The dialer may select a different physical dialer on each redial attempt.</li> <li>• The dialer will cycle through all dialer strings or matching dialer maps on each redial attempt before applying the redial interval.</li> </ul>

**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. Setting **attempts 0** prevents redial attempts without inactivating the **re-enable** option. The **re-enable** option can be applied to both serial dialers and dialer profile interfaces.

When a logical dialer interface such as a dialer profile or a dialer rotary group is used, redial attempts may occur on a different physical dialer on each attempt. The physical dialer selection algorithm may be customized using the **dialer rotor** interface configuration command.

Do not use the **dialer redial** command when a dialer profile has been configured with the **dialer persistent** command. Both these configuration commands prompt the router to dial out, so it is desirable to configure only one of them.

---

**Examples**

The following example configures the dialer to make five 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
<b>debug dialer events</b>	Displays debugging information about the packets received on a dialer interface.
<b>dialer persistent</b>	Forces a dialer interface to be connected at all times, even in the absence of interesting traffic.
<b>dialer rotor</b>	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**

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

<b>Command Default</b>	No remote name is specified.
------------------------	------------------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

<b>Usage Guidelines</b>	<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 <b>dialer remote-name</b> command. Issuing the <b>no dialer remote-name</b> 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>
-------------------------	---

<b>Examples</b>	The following partial example sets the name of the remote host to yourhost:
-----------------	---

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

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>ppp bap call</b>	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
	<b>dialer congestion-threshold</b>	Specifies congestion threshold in connected links.
	<b>sgbp dial-bids</b>	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** *interface-number*

**no dialer rotary-group** *interface-number*

<b>Syntax Description</b>	<i>interface-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 <b>interface dialer</b> command.
---------------------------	---

<b>Defaults</b>	No interfaces are included in a dialer rotary group.
-----------------	--

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>10.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	10.0	This command was introduced.
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.
!
```

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

---

**Related Commands**

Command	Description
<b>interface dialer</b>	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

<b>priority</b>	Selects the first outbound line with the highest priority; this is the selection criterion that was previously used.
<b>best</b>	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
<b>dialer priority</b>	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 7](#). 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 7** 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.
<b>P</b>	Dialing to be continued in pulse mode. Optionally accepted parameter.
<b>T</b>	Tone. Dialing to be continued in Dual Tone Multifrequency (DTMF) mode. Optionally accepted parameter.
<b>&amp;</b>	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
<b>dialer-group</b>	Controls access by configuring an interface to belong to a specific dialing group.
<b>dialer in-band</b>	Specifies that DDR is to be supported.
<b>dialer-list protocol (Dial)</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list.
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
<b>script dialer</b>	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.
<b>class</b> <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
	<b>dialer-group</b>	Controls access by configuring an interface to belong to a specific dialing group.
	<b>dialer wait-for-carrier-time (map-class)</b>	Specifies the length of time to wait for a carrier when dialing out to the dial string associated with a specified map class.
	<b>interface dialer</b>	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 preceded by a colon.

### 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 7](#). 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
<b>dialer-group</b>	Controls access by configuring an interface to belong to a specific dialing group.
<b>dialer in-band</b>	Specifies that DDR is to be supported.
<b>dialer-list protocol (Dial)</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of a protocol and a previously defined access list.
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
<b>script dialer</b>	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
	<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
	<b>dialer outgoing</b>	Configures the dialer map class for a NSF dialing plan to support outgoing calls.
	<b>map-class dialer</b>	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**

<b>Command</b>	<b>Description</b>
<b>dialer aaa</b>	Allows a dialer to access the AAA server for dialing information.
<b>request-dialout</b>	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**

<b>Syntax Description</b>	<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.
---------------------------	----------------	--

<b>Defaults</b>	30 seconds
-----------------	------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	10.0	This command was introduced.

<b>Usage Guidelines</b>	<p>On asynchronous interfaces, the <b>dialer wait-for-carrier-time</b> command sets the total time allowed for the chat script to run.</p> <p>If a carrier signal is not detected in this amount of time, the interface is disabled until the enable timeout occurs (configured with the <b>dialer enable-timeout</b> command).</p> <p>Do not use this command for BRI and leased-line interfaces.</p>
-------------------------	--

<b>Examples</b>	The following example specifies a carrier wait time of 45 seconds on asynchronous interface 1:
-----------------	--

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

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>dialer enable-timeout</b>	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**

<b>Syntax Description</b>	<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.
---------------------------	----------------	---

<b>Defaults</b>	30 seconds
-----------------	------------

<b>Command Modes</b>	Map-class dialer configuration
----------------------	--------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 class “Eng” on interface Dialer2:

```
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 wait-for-line-protocol

To set a maximum time the dialer will wait for a line protocol after establishing a physical connection before considering the call unsuccessful, use the **dialer wait-for-line-protocol** command in interface configuration mode. To disable this function, use the **no** form of this command.

**dialer wait-for-line-protocol** *wait-time*

**no dialer wait-for-line-protocol**

<b>Syntax Description</b>	<i>wait-time</i>	Time, in seconds, that the dialer will wait for the line protocol to come up after the physical layer connection has been established. The time can range from 1 to 2147483 seconds.
---------------------------	------------------	--

<b>Defaults</b>	Timer is disabled.
-----------------	--------------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(4)T	This command was introduced.

<b>Usage Guidelines</b>	<p>This command is supported only with encapsulation PPP.</p> <p>By default the Cisco IOS software considers a dial-out attempt successful if a connection is established to the physical layer (Layer 1 of the Open System Interconnection reference model). The <b>dialer wait-for-line-protocol</b> command can be used to configure a router to wait a specific amount of time for a line protocol to come up once a physical layer connection has been established. If the call is dropped before the timer has elapsed, the call will be considered a failure. Redial will be triggered if the redial options have been configured with the <b>dialer redial</b> interface configuration command. The dialer failure statistics for the physical interface will be updated, which may influence the selection of a physical dialer for the next dial attempt. The physical dialer selection algorithm may be customized using the <b>dialer rotor</b> interface configuration command.</p>
-------------------------	--



#### Note

This command is not useful in conjunction with Cisco High-Level Data Link Control (HDLC) encapsulation. Cisco HDLC encapsulation is the default line protocol and will always come up regardless of line conditions.

<b>Examples</b>	The following example configures the dialer to wait 10 seconds for a line protocol after making a physical connection:
-----------------	--

```
dialer wait-for-line-protocol 10
```

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

# 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**

<b>Syntax Description</b>	<i>timeout</i>	The timeout value in seconds.
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Interface configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.3	This command was introduced.
<b>Usage Guidelines</b>	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.	
<b>Examples</b>	<p>The following example forces a 6-second delay to the backup interface once the primary interface recovers:</p> <pre>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</pre>	
<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>show dialer dnis</b>	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
<b>dialer watch-list</b>	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 seconds}
```

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

Syntax Description	
<i>group-number</i>	Group number assigned to the list. Valid group numbers are between 1 and 255.
<b>ip</b>	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.
<b>delay route-check initial</b> <i>seconds</i>	Number of 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	This command was introduced.
	12.1(3)T	The <b>delay route-check initial</b> <i>seconds</i> 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
<b>dialer watch-group</b>	Enables DDR backup on an interface using Dialer Watch.
<b>show ip route</b>	Displays all static IP routes, or those installed using the AAA route download function.

# dialer watch-list delay

To configure the router to delay before connecting or disconnecting a secondary link for a route monitored by Dialer Watch, use the **dialer watch-list delay** command in global configuration mode. To disable these delays, use the **no** form of this command.

```
dialer watch-list group-number delay { connect connect-time | disconnect disconnect-time }
```

```
no dialer watch-list group-number delay { connect connect-time | disconnect disconnect-time }
```

## Syntax Description

<i>group-number</i>	Group number assigned to the list. Valid group numbers are from 1 to 255.
<b>connect</b>	Specifies that the router will delay dialing the secondary link when the primary link becomes unavailable.
<i>connect-time</i>	Time, in seconds, after which the router rechecks for availability of the primary link. If the primary link is still unavailable, the secondary link is then dialed. Valid times range from 1 to 2147483.
<b>disconnect</b>	Specifies that the router will delay disconnecting the secondary link after detecting availability of the primary link.
<i>disconnect-time</i>	Time, in seconds, after which the router disconnects the secondary link once the primary link has been detected. Valid times range from 1 to 2147483.

## Defaults

No delay is configured.

## Command Modes

Global configuration

## Command History

Release	Modification
12.2(8)T	This command was introduced.

## Usage Guidelines

Use this command to configure a delay before connecting or disconnecting a secondary link for a route monitored by Dialer Watch. This command will not work unless dial-on-demand routing (DDR) is configured and Dialer Watch has been enabled.

## Examples

The following example configures the router to wait 10 seconds before verifying that the primary link is still down and dialing a secondary link:

```
dialer watch-list 1 ip 10.1.1.0 255.255.255.0
dialer watch-list 1 delay connect 10
```

The following example configures the router to wait 10 seconds to disconnect a secondary link once the primary link has been reestablished:

```
dialer watch-list 1 ip 10.1.1.0 255.255.255.0
dialer watch-list 1 delay disconnect 10
```

Related Commands	Command	Description
	<b>dialer watch-group</b>	Enables DDR backup on an interface using Dialer Watch.
	<b>dialer watch-list</b>	Adds the list of IP addresses to be monitored for Dialer Watch.

# 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
	<b>name (dial peer cor custom)</b>	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*

<b>Syntax Description</b>	<i>list-name</i> List name that is applied to incoming or outgoing calls to specific numbers or exchanges.								
<b>Defaults</b>	No default behavior or keywords.								
<b>Command Modes</b>	Global configuration								
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.1(3)T</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	12.1(3)T	This command was introduced.				
Release	Modification								
12.1(3)T	This command was introduced.								
<b>Usage Guidelines</b>	A COR list defines a capability set that is used in the COR checking between incoming and outgoing dial peers.								
<b>Examples</b>	<p>The following example adds two members to the COR list named list1:</p> <pre>dial-peer cor list list1   member 900block   member 800_call</pre>								
<b>Related Commands</b>	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>dial-peer cor custom</b></td> <td>Specifies that named COR apply to dial peers.</td> </tr> <tr> <td><b>member (dial peer cor list)</b></td> <td>Adds a member to a dial peer COR list.</td> </tr> <tr> <td><b>name (dial peer cor custom)</b></td> <td>Provides a name for a custom COR.</td> </tr> </tbody> </table>	Command	Description	<b>dial-peer cor custom</b>	Specifies that named COR apply to dial peers.	<b>member (dial peer cor list)</b>	Adds a member to a dial peer COR list.	<b>name (dial peer cor custom)</b>	Provides a name for a custom COR.
Command	Description								
<b>dial-peer cor custom</b>	Specifies that named COR apply to dial peers.								
<b>member (dial peer cor list)</b>	Adds a member to a dial peer COR list.								
<b>name (dial peer cor custom)</b>	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	
<i>predefined-option</i>	Predefined backplane DS-0 pairs. See <a href="#">Table 8</a> for a list of these options.
<b>userdefined</b> <i>option</i>	Number of backplane DS-0 interfaces used by the router shelf that you define, in the range 128 to 2048.

Defaults	
	Option pair 6

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 <a href="#">Table 8</a> . You can select the <b>userdefined</b> keyword and define your own split, if needed.

Table 8 lists the predefined options.

Table 8 *dial-shelf split backplane ds-0 Predefined Options*

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

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

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 8](#) 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
	<b>dial-shelf split slots</b>	Configures split dial shelves.
	<b>show tdm splitbackplane</b>	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**

<b>Command</b>	<b>Description</b>
<b>dial-shelf split backplane-ds0</b>	Connects two router shelves to a dial shelf.
<b>dial-shelf split slots none</b>	Configures the router in dial shelf split mode but with no slots owned.
<b>dial-shelf split slots remove</b>	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
	<b>dial-shelf split slots remove</b>	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*

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

<b>Defaults</b>	No default behavior or keywords.
-----------------	----------------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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.

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>dial-shelf split slots none</b>	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

<b>priority</b> <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.
<b>external</b>	Priority of an external clock source. The external clock source is connected to the front panel of the dial shelf controller (DSC) card.
{ <b>e1</b>   <b>t1</b> } [ <b>120ohm</b> ]	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 <b>120ohm</b> option if a 120 ohm coaxial cable is connected.
<b>freerun</b>	Priority of the local oscillator clock source.
<b>trunk-slot</b> <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).
<b>port</b> <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
<b>show dial-shelf</b>	Displays information about the types of cards in nonowned dial shelf slots.