



Legacy DDR Hub Commands

This chapter describes the commands required to configure interfaces on the router functioning as the hub in a hub-and-spoke network topology.

For configuration tasks and examples, refer to the “Configuring Legacy DDR Hubs” chapter in the *Dial Solutions Configuration Guide*.

clear dialer

To clear the values of dialer statistics for one or more serial interfaces or Basic Rate Interfaces (BRIs) configured for DDR, use the **clear dialer** privileged EXEC command.

```
clear dialer [interface type number]  
clear dialer [interface serial slot/port] (Cisco 7500 series)
```

Syntax Description

interface	(Optional) Indicates that one interface will be specified.
<i>type</i>	(Optional) Interface type, either async , serial , or bri .
<i>number</i>	(Optional) Interface number.
<i>slot/port</i>	Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.0.

If the **interface** keyword and the arguments are not used, dialer statistics are cleared on all interfaces.

Example

The following example clears the dialer statistics on serial interface 1:

```
clear dialer interface serial 1
```

dialer dtr

To enable 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** interface configuration command. To disable dial-on-demand routing (DDR) for the interface, use the **no** form of this command.

dialer dtr
no dialer dtr

Syntax Description

This command has no keywords or arguments.

Default

DTR dialing is disabled.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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.

Example

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

```
dialer dtr
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer in-band
dialer map
dialer string

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** interface configuration command. To return to the default value, use the **no** form of this command.

dialer enable-timeout *seconds*
no dialer enable-timeout

Syntax Description

seconds

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.

This value must be greater than the serial pulse interval for this interface, set via the **pulse-time** command.

Default

15 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command applies to inbound and outbound calls.

If your phone lines are often busy or down, you might want 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.

Example

The following example specifies a waiting period of 30 seconds on asynchronous interface 1:

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

dialer fast-idle (interface configuration)

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** interface configuration command. To return to the default value, use the **no** form of this command.

dialer fast-idle *seconds*
no dialer fast-idle

Syntax Description

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

Default

20 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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.

Example

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

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer idle-timeout (interface configuration)

dialer map

dialer-group

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

```
dialer-group group-number  
no dialer-group
```

Syntax Description

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

Default

No access is predefined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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

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

Example

The following example specifies dialer access group number 1.

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

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer-list

dialer idle-timeout (interface configuration)

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

dialer idle-timeout *seconds*
no dialer idle-timeout

Syntax Description

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

Default

120 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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

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

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

Use the **dialer idle-timeout** command to set a very high idle timer when multilink PPP is configured and you want a multilink bundle to be connected indefinitely. (The **dialer-load threshold 1** command no longer keeps a multilink bundle of *n* links connected indefinitely and the **dialer-load threshold 2** command no longer keeps a multilink bundle of 2 links connected indefinitely.)

Example

The following example specifies of an idle timeout of 3 minutes (180 seconds) on asynchronous interface 1:

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer fast-idle (interface configuration)
dialer-group

dialer in-band

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

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

Syntax Description

no-parity (Optional) Indicates that no parity is to be applied to the dialer string that is sent out to the modem on synchronous interfaces.

odd-parity (Optional) Indicates that the dialed number has odd parity (7-bit ASCII characters with the eighth bit as the parity bit) on synchronous interfaces.

Default

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

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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.

Example

The following example specifies DDR for asynchronous interface 1:

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map

dialer string

dialer-list

To define a DDR dialer list to control dialing by protocol or by a combination of protocol and access list, use the **dialer-list** global configuration command. To delete a dialer list, use the **no** form of this command.

```
dialer-list dialer-group protocol protocol-name {permit | deny | list access-list-number |
access-group}
no dialer-list dialer-group [protocol protocol-name [list access-list-number | access-group]]
```

Syntax Description

<i>dialer-group</i>	Number of a dialer access group identified in any dialer-group interface configuration command.
<i>protocol-name</i>	One of the following protocol keywords: appletalk , bridge , clns , clns_es , clns_is , decnet , decnet_router-L1 , decnet_router-L2 , decnet_node , ip , ipx , vines , or xns .
permit	Permits access to an entire protocol.
deny	Denies access to an entire protocol.
list	Specifies that an access list will be used for defining a granularity finer than an entire protocol.
<i>access-list-number</i>	Access list numbers specified in any DECnet, Banyan VINES, IP, Novell IPX, or XNS standard or extended access lists, including Novell IPX extended service access point (SAP) access lists and bridging types. See Table 106 for the supported access list types and numbers.
<i>access-group</i>	Filter list name used in the clns filter-set and clns access-group commands.

Default

No dialer lists are defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0. The **list** command and *access-list-number* and *access-group* arguments first appeared in Cisco IOS Release 10.3.

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

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

- The **no dialer-list 1 protocol protocol-name list access-list-number** command deletes the specified list.

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

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

The **dialer-list protocol list** command should be used for all protocols

Table 106 lists the access list types and numbers that the **dialer-list protocol list** command supports. The table does not include ISO CLNS because that protocol uses filter names instead of predefined access list numbers.

Table 106 Dialer-List Supported Access List Types and Numbers

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

Examples

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

access-list
clns filter-set
dialer-group
vines access-list

dialer load-threshold

To configure bandwidth on demand by setting the maximum load before the dialer places another call to a destination, use the **dialer load-threshold** interface command. 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%.
outbound	(Optional) Calculates the actual load using outbound data only.
inbound	(Optional) Calculates the actual load using inbound data only.
either	(Optional) Sets the maximum calculated load as the larger of the outbound and inbound loads.

Default

No maximum load is predefined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0. The **list** command and *access-list-number* and *access-group* arguments first appeared in Cisco IOS Release 10.3.

This command applies to dialer rotary groups only.

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 argument *load* 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 must 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 “Synchronous Serial Port Setup Commands” chapter in this manual for a description of the **bandwidth** command.

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 very high idle timer.

Example

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

You can use the master indexes or search online to find documentation of related commands.

bandwidth
interface dialer
dialer rotary-group

dialer map

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

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

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

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

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

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

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

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

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

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

Syntax Description

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

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

Defaults

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

Command Mode

Interface configuration

Usage Guidelines for Synchronous Interfaces

This command first appeared in Cisco IOS Release 10.0.

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

Usage Guidelines for ISDN Interfaces

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

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

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

Usage Guidelines for Asynchronous Interfaces

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

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

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

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

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

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

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

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

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

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

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

With an interface configured for Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP) and configured with the **name** *hostname* keyword and argument pair, the local device authenticates the remote site using CHAP, which transmits the remote site's host name to the central site. The central site then uses this name to authenticate the caller and uses the next hop address to transmit packets to the remote site. Because no dialer string is specified, the central site cannot call the remote router.

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

Examples

In the following example, the dialer speed is set at 56 kbps to call a remote site at 131.108.2.5:

```
interface async 1
encapsulation ppp
ppp authentication chap
dialer map ip 131.108.2.5 speed 56
```

The following example shows a dialing chat script and a login chat script. The **dialer in-band** command enables DDR on asynchronous interface 10, and the **dialer map** command looks for the specified dialing and the login scripts and then uses those scripts to dial 96837890.

```
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 96837890
```

In the following example, the remote site is calling the central site, and the central site is calling the remote site. The central router can use the name *ZZZ* to authenticate the remote router when they connect and also can use the dialer string 14155553434 to call the remote router if it is not currently connected.

```
interface async 1
dialer map ip 131.108.2.5 name ZZZ 14155553434
```

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

```
interface async 1
encapsulation ppp
ppp authentication chap
dialer map ip 131.108.2.5 name YYY
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

chat-script
ppp authentication chap
ppp authentication pap
username

dialer priority

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

dialer priority *number*
no dialer priority

Syntax Description

number 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.

Default

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

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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

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

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

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

Example

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

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

Related Commands

You can use the master indexes or search online for documentation of related commands.

interface dialer
dialer rotary-group

dialer rotary-group

To include a specified interface in a dialer rotary group, use the **dialer rotary-group** interface configuration command.

dialer rotary-group *number*

Syntax Description

number Number of the previously defined dialer interface in whose rotary group this interface is to be included. This is a number from 0 to 255. The dialer interface is defined by the **interface dialer** command.

Default

No interfaces are included in a dialer rotary group.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Example

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 131.108.2.1 255.255.255.0
  ip address 131.126.4.1 255.255.255.0 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 131.108.2.5 name YYY 14155553434
dialer map ip 131.126.4.5 name ZZZ
!
! The DTR pulse signals for three seconds on the interfaces in dialer
! group 1. This holds the DTR low so the modem can recognize that DTR has been
! dropped.
pulse-time 3
!
! Interfaces async 1 and async 2 are placed in dialer rotary group 1.
! All of the interface configuration commands (the encapsulation and dialer
! map commands shown earlier in this example) applied to interface
! dialer 1 apply to the physical interfaces assigned to the dialer group.
!
```

dialer rotary-group

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

interface dialer

dialer rotor

To specify the method for identifying the outbound line to be used for ISDN or asynchronous DDR calls, use the **dialer rotor** interface configuration command.

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

Syntax Description

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

Default

Disabled

Command Mode

Interface Configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 Command

You can use the master indexes or search online to find documentation of related commands.

dialer priority

dialer string

To specify the string (telephone number) to be called for interfaces calling a single site, use the **dialer string** interface configuration command. 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.

Default

No strings are predefined.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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 107. 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 107 ITU-T V.25bis Options

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

Example

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

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

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer-group
dialer in-band
dialer map
script dialer

dialer wait-for-carrier-time (interface configuration)

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

dialer wait-for-carrier-time *seconds*
no dialer wait-for-carrier-time

Syntax Description

seconds Number of seconds that the interface waits for the carrier to come up when a call is placed. Acceptable values are positive, nonzero integers.

Default

30 seconds

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

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

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

Example

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

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

Related Command

You can use the master indexes or search online to find documentation of related commands.

dialer enable-timeout

interface dialer

To define a dialer rotary group, use the **interface dialer** global configuration command.

```
interface dialer number
```

Syntax Description

<i>number</i>	Number of the dialer rotary group. It can be number in the range 0 through 255.
---------------	---

Default

No dialer rotary groups are predefined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Dialer rotary groups allow you to apply a single interface configuration to a set of physical interfaces. This allows a group of interfaces to be used as a pool of interfaces for calling many destinations.

Once the interface configuration is propagated to a set of interfaces, those interfaces can be used to place calls using the standard DDR criteria. When multiple destinations are configured, any of these interfaces can be used for outgoing calls.

Dialer rotary groups are useful in environments that require multiple calling destinations. Only the rotary group needs to be configured with the **dialer map** commands. The only configuration required for the interfaces is the **dialer rotary-group** command indicating that each interface is part of a dialer rotary group.

Although a dialer rotary group is configured as an interface, it is not a physical interface. Instead, it represents a group of interfaces. Interface configuration commands entered after the **interface dialer** command will be applied to all physical interfaces assigned to specified rotary groups. Individual interfaces in a dialer rotary group do not have individual addresses. The dialer interface has a protocol address, and that address is used by all interfaces in the dialer rotary group.

Example

The following example identifies interface dialer 1 as the dialer rotary group leader. Interface dialer 1 is not a physical interface, but represents a group of interfaces. The interface configuration commands that follow apply to all interfaces included in this group.

```
interface dialer 1
  encapsulation ppp
  authentication chap
  dialer in-band
  ip address 1.2.3.4
  dialer map ip 1.2.2.5 name YYY 14155553434
  dialer map ip 1.3.2.6 name ZZZ
```

show dialer

To display general diagnostic information for interfaces configured for DDR, use the **show dialer EXEC** command.

```
show dialer [interface type number]
```

Syntax Description

interface	(Optional) Displays information for the interface specified by the arguments <i>type</i> and <i>number</i> .
<i>type</i>	(Optional) Interface type.
<i>number</i>	(Optional) Interface number.

Command Mode

EXEC

Sample Displays

This command first appeared in Cisco IOS Release 10.0.

If you enter the **show dialer interface** command for the D channel of an ISDN BRI or PRI, the command output also displays the B channels. That is, the command **show dialer interface bri 0** displays information of interfaces bri 0, bri 0:1, and bri 0:2. The command **show dialer interface serial 0:23** (for a channelized T1 line configured for ISDN PRI) displays information for serial interfaces 0:23, 0:0, 0:1, and so forth to 0:22.

If you have defined a dialer group that consists of the interfaces serial 0, serial 1, and bri 2, the command **show dialer interface dialer 1** displays information for interfaces bri 0, bri 0:1, bri 0:2, serial 1, and serial 0.

The following is sample output from the **show dialer** command for a BRI interface when dialer profiles are configured:

```
impulse# show dialer interface bri 0

BRI0 - dialer type = ISDN

Dial String      Successes   Failures    Last called   Last status

0 incoming call(s) have been screened.

BRI0: B-Channel 1
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)

Dialer state is data link layer up

Dial reason: ip (s=6.1.1.8, d=6.1.1.1)

Interface bound to profile Dialer0

Time until disconnect 102 secs
Current call connected 00:00:19
Connected to 5773872 (wolfman)
```

```

BRI0: B-Channel 2
Idle timer (120 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Dialer state is idle

```

Table 108 describes significant fields shown in the display.

Table 108 Show Dialer Interface BRI Field Descriptions

Field	Description
BRI0 - dialer type = ISDN	ISDN dialer.
Dial String	Dial strings of logged calls (telephone numbers). On ISDN BRI interfaces, if you have specified a subaddress number in the dialer string , this number is included in the dial string after a colon.
Successes	Successful connections (even if no data is passed).
Failures	Failed connections; call not successfully completed.
Last called	Time that last call occurred to specific dial string.
Last status	Status of last call to specific dial string (successful or failed).
0 incoming call(s) have been screened.	Number of calls subjected to Dialer Profiles screening to determine how the call is to be treated.
BRI0: B-Channel 1	Header indicating the following data is for B channel 1.
Idle timer (120 secs), Fast idle timer (20 secs)	Settings (in seconds)for the idle timer and the fast idle timer.
Wait for carrier (30 secs), Re-enable (15 secs)	Settings (in seconds)for the wait for carrier timer and the reenable timer.
Dialer state is data link layer up	The message “data link layer up” suggests that the dialer came up properly; if it says anything else then dialer did not come up properly. The message “physical layer up” means the line protocol (LCP) came up, but the NCP did not come up. The show interfaces command also provides the similar information.
Dial reason: ip (s=6.1.1.8, d=6.1.1.1)	What initiated the dial, namely an IP packet, plus source and destination address in the packet.
Interface bound to profile Dialer0	Dialer profile that is bound to this interface or B channel.
Time until disconnect	Time until line is configured to disconnect.
Current call connected	Time at which the current call was connected.
Connected to	Dial string to which line is currently connected.

The following is sample output from the **show dialer** command for an asynchronous interface:

```

Router# show dialer interface async 1

Async1 - dialer type = IN-BAND NO-PARITY
Idle timer (900 secs), Fast idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
Time until disconnect 838 secs
Current call connected 0:02:16
Connected to 8986

```

Dial String	Successes	Failures	Last called	Last status	
8986	0	0	never		Default
8986	8	3	0:02:16	Success	Default

Table 109 describes significant fields shown in the display.

Table 109 Show Dialer Interface Async Field Descriptions for In-Band Dialers

Field	Description
Async 1	Name of an asynchronous interface.
dialer type = IN-BAND	Indicates that DDR is enabled.
Idle timer (900 secs)	Idle timeout specification (in seconds).
Fast idle timer (20 secs)	Fast idle timer specification (in seconds).
Wait for carrier (30 secs)	Wait for carrier timer specification (in seconds).
Re-enable (15 secs)	Enable timeout specification (in seconds).
Time until disconnected	Time until line is configured to disconnect.
Current call connected	Time at which the current call was connected.
Connected to	Dial string to which line is currently connected.
Dial String	Dial strings of logged calls (telephone numbers). On ISDN BRI interfaces, if you have specified a subaddress number in the dialer string or dialer map command, this number is included in the dial string after a colon.
Successes	Successful connections (even if no data is passed).
Failures	Failed connections; call not successfully completed.
Last called	Time that last call occurred to specific dial string.
Last status	Status of last call to specific dial string (successful or failed).
Default	If the DDR facility is using the dial string specified with the dialer string command, the word <i>Default</i> is appended to the Last status entry.

When the **show dialer EXEC** command is issued for a synchronous serial interface configured for DTR dialing, output similar to the following is displayed:

```
Serial 0 - dialer type = DTR SYNC
Idle timer (120 secs), Fst idle timer (20 secs)
Wait for carrier (30 secs), Re-enable (15 secs)
```

Dial String	Successes	Failures	Last called	Last status	
----	1	0	1:04:47	Success	DTR dialer
8986	0	0	never		Default

Table 110 describes additional fields shown in the display.

Table 110 Show Dialer Field Descriptions for DTR Dialers

Field	Description
DTR SYNC	Indicates that DDR is enabled and that DTR dialing is enabled on this synchronous interface.
Last status: Success	Indicates that the last call was successful and that DTR dialing was used.
DTR dialer	Phrase appended to the Last status entry to indicate that this is a DTR dialer.

If an interface is connected to a destination, a display is provided that indicates the idle time before the line is disconnected. (The value decrements each second.) Then the duration of the current connection is shown. The following shows an example of this display; it appears after the third line in the **show dialer** display:

```
Time until disconnect 596 secs
Current call connected 0:00:25
```

After a call disconnects, the system displays the time remaining before being it can dial again. The following is an example of this display; it appears after the third line in the **show dialer** display:

```
Time until interface enabled 8 secs
```

If the **show dialer** command is issued for an interface on which DDR is not enabled, the system displays an error message. The following is a sample error message:

```
Async 1 - Dialing not enabled on this interface.
```

If an interface is configured for DDR, the **show interfaces** command displays the following message:

```
Asyncl is up, line protocol is up (spoofing)
Hardware is Async Serial
```

The word *spoofing* indicates that the line really is not up, but the dialer is forcing the line to masquerade as “up” so that upper level protocols will continue to operate as expected. Spoofing is a state added to allow DDR to work. The interface “dials on demand” in response to packets being routed to it. But because no packets are routed to down interfaces, the interface must pretend to be up (spoo) so packets will be routed to it when it is not connected. Spoofing is the normal idle state on a dial-on-demand interface.

If caller ID screening is configured on an ISDN BRI, the **show dialer** command display includes a line similar to the following:

```
1 incoming call(s) have been screened.
```

This line reports the number of calls that have been screened.

show dialer map

To display the current dialer maps, next-hop protocol addresses, user names, and interfaces on which they are configured, use the **show dialer map** privileged EXEC command.

show dialer map

Syntax Description

This command has no arguments and keywords.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Sample Display

The following is sample output from the **show dialer map** command. The dialer maps are grouped by network address. When multiple dialer maps exist for the same network address, the dialer maps differ only by phone number. In this output, the dialer maps marked “BAP” are temporary dialer maps the PPP Bandwidth Allocation Control Protocol (BACP) creates when a peer calls from a different phone number than is configured or when a peer calls from a number that does not appear in an existing map. The temporary dialer maps allows PPP BACP to make outgoing calls to the peers.

```
bap_peer# show dialer map

Static dialer map ip 6.1.1.1 name peer_1 on Dialer1
Static dialer map ip 6.1.1.2 name peer_2 on Dialer1
BAP dialer map ip 6.1.1.2 name peer_2 on Dialer1
Dynamic dialer map ip 6.1.1.3 name peer_3 on Dialer1
BAP dialer map ip 6.1.1.3 name peer_3 on Dialer1
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

dialer map