



# Dialer Map VRF-Aware for an MPLS VPN

## Feature History

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

This document describes the Dialer Map VRF-Aware for an MPLS VPN feature in Cisco IOS Release 12.2(8)T and includes the following sections:

- [Feature Overview, page 1](#)
- [Supported Platforms, page 3](#)
- [Supported Standards, MIBs, and RFCs, page 4](#)
- [Prerequisites, page 4](#)
- [Configuration Tasks, page 4](#)
- [Configuration Example, page 6](#)
- [Command Reference, page 12](#)

## Feature Overview

The dialer software in Cisco IOS prior to Release 12.2(8)T had no way to dial two different destinations with the same IP address. More specifically, in networks where a network access server (NAS) supports dialing clients with overlapping addresses, dial-out attempts would fail. The Dialer Map VRF-Aware for an MPLS VPN feature solves this problem.

A VRF—virtual routing and forwarding instance—is a per-Virtual Private Network (VPN) routing information repository that defines the VPN membership of a customer site attached to the NAS. A VRF consists of an IP routing table, a derived Cisco Express Forwarding (CEF) table, a set of interfaces that use the forwarding table, and a set of rules and routing protocol parameters that control the information that is included in the routing table. A separate set of routing and CEF tables is maintained for each VPN customer.

The Multiprotocol Label Switching (MPLS) distribution protocol is a high-performance packet forwarding technology that integrates the performance and traffic management capabilities of data link layer switching with the scalability, flexibility, and performance of network-layer routing.

The Cisco IOS dialer software is “VRF-aware for an MPLS VPN,” which means that it can distinguish between two destinations with the same IP address using information stored in the VRF. This capability is provided to the dialer software by two existing Cisco IOS commands, **dialer map** and **ip route**, which have been enhanced to include VRF information.

In previous Cisco IOS releases, the dialer software obtained the telephone number for dial-out based on the destination IP address configured in the **dialer map** command. Now, the enhanced **dialer map** command supplies the name of the VRF so that the telephone number to be dialed is based on the VRF name and the destination IP address. The VRF is identified based on the incoming interface of the packet, and is used with the destination IP address defined in the **dialer map** command to determine the telephone number to be dialed.

The **ip route** configuration command also includes the VRF information. When a packet arrives in an incoming interface that belongs to a particular VRF, only those **ip route** commands that correspond to that particular VRF are used to determine the destination interface.

## Benefits

The Dialer Map VRF-Aware for an MPLS VPN feature allows the dialer software to dial out in an MPLS-based VPN. The MPLS VPN model simplifies network routing. For example, rather than needing to manage routing over a complex virtual network backbone composed of many virtual circuits, an MPLS VPN user can employ the backbone of the service provider as the default route in communicating with all other VPN sites.

This default route capability allows several sites to transparently interconnect through the service provider network. One service provider network can support several different IP VPNs, each of which appears to its users as a separate, private network. Within a VPN, each site can send IP packets to any other site in the same VPN, because each VPN is associated with one or more VRFs. The VRF is a key element in the VPN technology, because it maintains the routing information that defines a customer VPN site.

For additional benefits and information about MPLS, VPNs, and VRF, refer to the documents listed in the “[Related Documents](#)” section.

## Related Documents

Additional information about configuring networks that can take advantage of the Dialer Map VRF-Aware for an MPLS VPN feature can be found in the following Cisco IOS documentation:

- *Cisco IOS Dial Technologies Command Reference*, Release 12.2.
- *Cisco IOS Dial Technologies Configuration Guide*, Release 12.2. Refer to the chapter “Configuring Virtual Profiles” in the part “Virtual Templates, Profiles, and Networks.”
- *Cisco IOS Switching Services Command Reference*, Release 12.2.
- *Cisco IOS Switching Services Configuration Guide*, Release 12.2. Refer to the chapters “Multiprotocol Label Switching Overview” and “Configuring Multiprotocol Label Switching” in the part “Multiprotocol Label Switching.”

# Supported Platforms

The Dialer Map VRF-Aware for an MPLS VPN feature is supported on the following Cisco router and access server platforms:

- Cisco 1600 series
- Cisco 1720
- Cisco 1721
- Cisco 1750
- Cisco 1751
- Cisco 3600 series
- Cisco 3631
- Cisco 3725
- Cisco 3745
- Cisco 7200 series
- Cisco 7500 series
- Cisco 802
- Cisco 820
- Cisco 828
- Cisco uBR7200

## Determining Platform Support Through Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Feature Navigator. Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to [cco-locksmith@cisco.com](mailto:cco-locksmith@cisco.com). An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Feature Navigator home page at the following URL:

<http://www.cisco.com/go/fn>

# Supported Standards, MIBs, and RFCs

## Standards

None

## MIBs

None

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

## RFCs

None

## Prerequisites

Before beginning the tasks described in this document, you need to understand how to configure the following network features:

- Virtual profiles with two-way AAA authentication
- MPLS VPNs

Refer to the documents listed in the “[Related Documents](#)” section for information about configuring these features.

## Configuration Tasks

See the following sections for the configuration tasks for this feature. Each task in the list is identified as either required or optional.

- [Configuring Dialer Map VRF-Aware for an MPLS VPN](#) (required)
- [Verifying Dialer Map VRF-Aware for an MPLS VPN](#) (optional)

## Configuring Dialer Map VRF-Aware for an MPLS VPN

To map a VRF and next hop address combination to a dial string and thereby allow the dialer software to be VRF-aware for an MPLS VPN, use the following commands beginning in global configuration mode.

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>dialer number</i>	Enters configuration mode and begins dialer configuration.
Step 2	Router(config-if)# <b>dialer map ip</b> <i>protocol-next-hop-address vrf vrf-name</i> <b>name</b> <i>host-name dial-string</i>	Maps a VRF and next hop address combination to a dial string (telephone number).

	Command	Purpose
Step 3	Router(config-if)# <b>exit</b>	Exit to global configuration mode.
Step 4	Router(config)# <b>ip route vrf</b> <i>vrf-name</i> <i>ip-address mask interface-type</i> <i>interface-number</i>	Configures a VRF and next hop address combination that points to the interface where the dialer software should make the connection.

These commands are only part of the required configuration and show how to map a VRF and next hop address combination to a dial string. Refer to the documents listed in the section [“Related Documents”](#) and the example in the [“Configuration Example”](#) section, for details on where to include these commands in the network configuration.

## Verifying Dialer Map VRF-Aware for an MPLS VPN

The verification process described in this section is based on the following configuration:

```
interface dialer 1
  dialer map ip 10.0.0.1 vrf blue name peer1 peer1_number
ip route vrf blue 10.0.0.1 255.255.255.255 Dialer0
```

To verify correct operation of the Dialer Map VRF-Aware for an MPLS VPN feature, on the customer edge NAS, use the **ping** command in EXEC mode to place a call to peer. The expected result is that the NAS successfully dials out to peer1. If the call fails, use the **show adjacency** EXEC command to check CEF adjacency table information.

## Troubleshooting Tips

If you encounter problems with the Dialer Map VRF-Aware for an MPLS VPN feature, use the following **debug** privileged EXEC commands on the NAS to help you determine where the problem lies:

- **debug ppp authentication**
- **debug ppp negotiation**
- **debug aaa authentication**
- **debug aaa authorization**
- **debug radius**
- **debug dialer**

# Monitoring and Maintaining Dialer Map VRF-Aware for an MPLS VPN

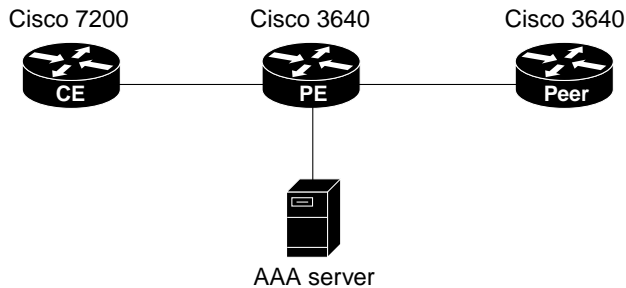
To monitor and maintain the Dialer Map VRF-Aware for an MPLS VPN feature, use the following EXEC commands:

Command	Purpose
Router# <b>show adjacency</b>	Displays CEF adjacency table information.
Router# <b>show ip route</b>	Displays all static IP routes, or those installed using the AAA route download function.
Router# <b>show users</b>	Displays information about the active lines on the router.

## Configuration Example

This section provides a configuration example of the Dialer Map VRF-Aware for an MPLS VPN feature on the simple network topology shown in [Figure 1](#).

**Figure 1** CE-to-PE-to-Peer MPLS VPN Topology



### Note

The network addresses and telephone numbers used in the following configuration are examples only and will not work if tried in an actual network configuration.

#### Customer Edge (CE) Router

```

!
hostname oaktree02
enable secret 5 !1!35Fg$Ep4.D8JGpg7rKxQa49BF9/
!
!
ip subnet-zero
no ip domain-lookup
!
!
controller T1 5/0
!
controller T1 5/1
!
!
!
interface FastEthernet0/0
  no ip address
  no ip mroute-cache
  
```

```
duplex auto
speed auto
!
interface FastEthernet0/1
no ip address
no ip mroute-cache
shutdown
duplex auto
speed auto
!
interface Ethernet1/0
ip address 10.0.58.11 255.255.255.0
no ip mroute-cache
half-duplex
!
interface Ethernet1/1
ip address 50.0.0.2 255.0.0.0
no ip mroute-cache
half-duplex
!
interface Ethernet1/2
no ip address
no ip mroute-cache
shutdown
half-duplex
!
interface Ethernet1/3
no ip address
no ip mroute-cache
shutdown
half-duplex
!
interface Serial2/0
no ip address
no ip mroute-cache
shutdown
no fair-queue
serial restart-delay 0
!
interface Serial2/1
no ip address
no ip mroute-cache
shutdown
serial restart-delay 0
!
interface Serial2/2
no ip address
no ip mroute-cache
shutdown
serial restart-delay 0
!
interface Serial2/3
no ip address
no ip mroute-cache
shutdown
serial restart-delay 0
!
interface Serial3/0
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/1
no ip address
```

## Configuration Example

```

no ip mroute-cache
shutdown
!
interface Serial3/2
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/3
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/4
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/5
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/6
no ip address
no ip mroute-cache
shutdown
!
interface Serial3/7
no ip address
no ip mroute-cache
shutdown
!
interface FastEthernet4/0
no ip address
no ip mroute-cache
shutdown
duplex auto
speed auto
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.0.58.1
ip route 60.0.0.0 255.0.0.0 50.0.0.1
no ip http server
!
!
snmp-server manager
banner motd ^C AV-8B OAKTREE^C
alias exec r sh run
!
line con 0
exec-timeout 0 0
line aux 0
login
line vty 0 4
no login
!
end

```

**Provider's Edge (PE) Router**

```
!  
hostname pinetree02  
!  
aaa new-model  
!  
!  
aaa authentication login con-log none  
aaa authentication ppp default group radius  
aaa authorization network default group radius  
aaa session-id common  
enable secret 5 $1$7KlA$xpC8l4dJcZogbzZvGUtF1/  
!  
username rubbertree02 password 0 Hello  
ip subnet-zero  
!  
!  
no ip domain-lookup  
!  
!  
ip vrf yellow  
  rd 100:1  
ip cef  
virtual-profile aaa  
isdn switch-type primary-5ess  
!  
!  
controller T1 3/0  
  framing esf  
  linecode b8zs  
  pri-group timeslots 1-24  
!  
controller T1 3/1  
  framing esf  
  linecode b8zs  
!  
controller T1 3/2  
  framing esf  
  linecode b8zs  
!  
controller T1 3/3  
  framing esf  
  linecode b8zs  
!  
controller T1 3/4  
  framing esf  
  linecode b8zs  
!  
controller T1 3/5  
  framing esf  
  linecode b8zs  
!  
controller T1 3/6  
  framing esf  
  linecode b8zs  
!  
controller T1 3/7  
  framing esf  
  linecode b8zs  
!  
!
```

```

interface Loopback0
 ip vrf forwarding yellow
 ip address 70.0.0.1 255.0.0.0
!
interface FastEthernet1/0
 no ip address
 shutdown
 duplex half
!
interface Ethernet2/0
 ip address 10.0.58.3 255.255.255.0
 duplex full
!
interface Ethernet2/1
 ip vrf forwarding yellow
 ip address 50.0.0.1 255.0.0.0
 duplex half
!
interface Ethernet2/2
 no ip address
 shutdown
 duplex half
!
interface Ethernet2/3
 no ip address
 shutdown
 duplex half
!
interface Serial3/0:23
 description phone# 555-3123
 no ip address
 encapsulation ppp
 dialer rotary-group 0
 dialer-group 1
 isdn switch-type primary-5ess
 ppp authentication chap
!
interface Serial4/0
 no ip address
 shutdown
 no fair-queue
!
interface Serial4/1
 no ip address
 shutdown
!
interface Serial4/2
 no ip address
 shutdown
!
interface Serial4/3
 no ip address
 shutdown
!
interface Dialer0
 ip address negotiated
 encapsulation ppp
 dialer in-band
 dialer map ip 60.0.0.12 vrf yellow name rubbertree02 5552171
 dialer map ip 60.0.0.2 5552172
 dialer-group 1
 ppp authentication chap
!

```

```

ip classless
ip route 0.0.0.0 0.0.0.0 10.0.58.1
ip route 60.0.0.2 255.255.255.255 Dialer0
ip route vrf yellow 60.0.0.0 255.0.0.0 Dialer0 permanent
no ip http server
ip pim bidir-enable
!
ip director cache time 60
dialer-list 1 protocol ip permit
!
!
!
radius-server host 172.19.192.89 auth-port 1645 acct-port 1646 key rad123
radius-server retransmit 3
call rsvp-sync
!
no mgcp timer receive-rtcp
!
mgcp profile default
!
dial-peer cor custom
!
!
!
gatekeeper
shutdown
!
banner motd ^C  F/A-18  PINETREE ^C
!
line con 0
exec-timeout 0 0
login authentication con-log

line aux 0
line vty 5 15
!
!
end

```

### Peer Router

```

!
hostname rubbertree02
!
logging buffered 32000 debugging
enable secret 5 $1$RCKC$scgtdlaDzjSyUVAi7KK5Q.
enable password Windy
!
username pinetree02 password 0 Hello
!
!
!
ip subnet-zero
no ip domain-lookup
!
isdn switch-type basic-5ess
!
!
!
interface Ethernet0
ip address 10.0.58.9 255.255.255.0
no ip route-cache
!

```

```

interface Serial0
  no ip address
  no ip route-cache
  shutdown
!
interface BRI0
  description phone# 555-2171
  ip address 60.0.0.12 255.0.0.0
  encapsulation ppp
  no ip route-cache
  dialer map ip 60.0.0.11 5553123
  dialer map ip 60.0.0.2 5552172
  dialer-group 1
  isdn switch-type basic-5ess
  isdn fast-rollover-delay 45
!
ip default-gateway 10.0.58.1
ip classless
ip route 0.0.0.0 0.0.0.0 10.0.58.1
ip route 50.0.0.0 255.0.0.0 70.0.0.1
no ip http server
!
dialer-list 1 protocol ip permit
no cdp run
banner motd ^C F-4B RUBBERTREE^C
!
line con 0
  exec-timeout 0 0
line vty 0 4
  password Windy
  login
!
end

```

### AAA Server User File

```
[aaa-serv]/usr/testing/bin> ./radiusd_1.16 -d . -a . -x
```

```

greentree-16      Password = "Hello", Expiration = "Dec 31 2005"
                  Service-Type = Framed-User,
                  Framed-Protocol = PPP
                  cisco-avpair = "lcp:interface-config=ip vrf forwarding yellow \nip
unnumbered Loopback0"

```

## Command Reference

This section documents the modified **dialer map** command. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

# 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-regexp | 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-regexp | 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 class-name [dial-string[:isdn-subaddress]]
```

```
no dialer map protocol-keyword protocol-next-hop-address [name host-name] [speed 56 | speed 64] [broadcast] class 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 Virtual Private Network (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 an 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>—IOS 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> <li>• <b>vines</b>—Banyan VINES</li> <li>• <b>xns</b>—Xerox Network Services</li> </ul>
<b>broadcast</b>	(Optional) Broadcasts are forwarded 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) 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. The dial string and ISDN subaddress, when used, must be the last item in the command line.

**Defaults**

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

**Command Modes**

Interface configuration

**Command History**

Release	Modification
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.

**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 on 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, see the “Regular Expressions” appendix in the *Cisco IOS Dial Technologies Configuration Guide*, Release 12.2.

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

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

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

The modem lines (specified by the argument *regular-expression* 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 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 send 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 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 calling line identification (CLI)—also known as caller ID and ANI—is provided, the *host-name* field may contain the number that calling line ID provides.

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 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 95557890.

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

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 14155553434 to call the remote router if it is not currently connected.

```
interface async 1
dialer map ip 172.19.2.5 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 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 Rex 06966600050
 dialer map ip 10.0.0.40 name IB class Bubba 778578
 dialer map ip 10.0.0.45 name IC class Scout 778579
 ppp authentication chap
!
map-class dialer Scout
 dialer idle-timeout 300
 dialer isdn short-hold 10
!
map-class dialer Rex
 dialer idle-timeout 300
!
map-class dialer Bubba
 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 49305555655:3789
```

### 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.

```
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 green_vrf name green_name 5552345
 dialer map ip 10.9.9.9 vrf yellow_vrf name yellow_name 5553456
 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 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.
<b>virtual-profile aaa</b>	Enables virtual profiles by AAA configuration.

