VPDN Multihop by DNIS

The VPDN Multihop by DNIS feature allows dialed number identification service (DNIS)-based multihop capability in a virtual private dialup network (VPDN). This feature allows you to take advantage of the aggregation capability offered by multihop switching when users dial in to a network using a standard telephone line.

Configuration Information

Configuration information is included in the "Configuring Multihop VPDN" module in the *Cisco IOS VPDN Configuration Guide*, Release 12.4T, at the following URL:

- http://www.cisco.com/univercd/cc/td/doc/product/software/ios124/124tcg/tvpdn_c/vpc5mhht.htm

Command Reference

This section documents modified commands.

- **vpdn multihop**
- **vpdn search-order**

vpdn multihop

To enable virtual private dialup network (VPDN) multihop, use the **vpdn multihop** command in global configuration mode. To disable VPDN multihop capability, use the **no** form of this command.

vpdn multihop

no vpdn multihop

Syntax Description

This command has no arguments or keywords.

Command Default

Multihop is disabled.

Command Modes

Global configuration

Command History

Release	Modification
11.3(5)T	This command was introduced.
12.2(8)B	Support was added for dialed number identification service (DNIS)-based multihop capability.
12.2(13)T	Support was added for DNIS-based multihop capability.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB, including support for DNIS-based multihop capability.

Usage Guidelines

Use this command to enable multihop VPDN. Multihop VPDN allows packets to pass through multiple VPDN tunnels. Ordinarily, packets are not allowed to traverse more than one tunnel. With multihop enabled, a packet may traverse as many as four tunnels.

VPDN multihop allows a router configured as a tunnel switch to act as both a network access server (NAS) and a tunnel server, receiving packets from an incoming VPDN tunnel and sending them out over an outgoing VPDN tunnel.

A tunnel switch may terminate incoming VPDN tunnels from multiple devices, and initiate outgoing tunnels to one or more tunnel servers. The outgoing tunnel is selected using either a domain name, a remote tunnel name, or a DNIS number. The order in which these criteria are searched by the Cisco IOS software is determined by the **vpdn search-order** command.

VPDN multihop must be enabled for a Multichassis Multilink PPP (MMP) stack group deployment to function when incoming calls traverse a VPDN tunnel. For more information on configuring multihop VPDN for MMP, refer to the *Cisco IOS VPDN Configuration Guide*.

Examples

The following example configures the NAS, tunnel switch, and tunnel server to establish a multihop VPDN tunnel using L2TP:

NAS Configuration

```
! Configure the NAS to initiate VPDN dial-in sessions to the tunnel switch
vpdn-group 1
 request-dialin
  protocol l2tp
  domain cisco.com
!
 initiate-to ip 172.22.66.25
 local name ISP-NAS
```

Tunnel Switch Configuration

```
!Enable multihop
vpdn multihop
!
! Configure the tunnel switch to use the multihop hostname in the authentication search.
 vpdn search-order multihop-hostname domain dnis
!
! Configure the tunnel switch to accept dial-in sessions from the NAS
vpdn-group tunnelin
 accept-dialin
  protocol l2tp
  virtual-template 1
!
 terminate-from hostname ISP-NAS
 local name ISP-Sw
!
! Configure the tunnel switch to initiate VPDN dial-in sessions to the tunnel server
vpdn-group tunnelout
 request-dialin
  protocol l2tp
  multihop-hostname ISP-NAS
!
 initiate-to ip 10.2.2.2
 local name ISP-Sw
```

Tunnel Server Configuration

```
! Configure the tunnel server to accept dial-in sessions from the NAS
vpdn-group 1
 accept-dialin
  protocol l2tp
  virtual-template 1
!
 terminate-from hostname ISP-Sw
 local name ENT-TS
```

The following example configures one member of a stack group and a NAS for dial-in L2F VPDN tunneling. Multihop VPDN must be enabled on each stack group member to allow calls to be forwarded to the bundle owner.

Tunnel Server A Configuration

```
!Enable multihop VPDN
vpdn multihop
!
!Configure the tunnel server to accept L2F tunnels from the NAS
vpdn-group group1
 accept-dialin
```

```
  protocol l2f
  virtual-template 1
  exit
 terminate-from 172.18.32.139
!
!Configure the tunnel server as a stack group member
username user1 password mypassword
sgbp group mystack
sgbp member tunnelserverb 10.1.1.2
sgbp member tunnelserverc 10.1.1.3
```

NAS Configuration

```
!Configure the NAS to initiate L2F tunnels
vpdn-group group1
 request-dialin
  protocol l2f
  domain cisco.com
!
!Configure the NAS with the IP address of each tunnel server in the stack group
 initiate-to ip 10.1.1.1
 initiate-to ip 10.1.1.2
 initiate-to ip 10.1.1.3
```

Related Commands

Command	Description
vpdn enable	Enables VPDN networking on the router and informs the router to look for tunnel definitions in a local database and on a remote authorization server (home gateway), if one is present.
vpdn search-order	Specifies how a NAS or tunnel switch is to perform VPDN tunnel authorization searches.
vpdn-group	Creates a VPDN group and enters VPDN group configuration mode.

vpdn search-order

To specify how a network access server (NAS) or tunnel switch is to perform virtual private dialup network (VPDN) tunnel authorization searches, use the **vpdn search-order** command in global configuration mode. To restore the default search order, use the **no** form of this command.

vpdn search-order {[**dnis**] [**domain**] [**multihop-hostname**]}

no vpdn search-order

Syntax Description

dnis	Searches on the dialed number identification service (DNIS) number.
domain	Searches on the domain name.
multihop-hostname	Searches on the hostname or tunnel ID of the ingress tunnel for a multihop tunnel switch.

Command Default

When this command is not enabled, by default the router will search first on the DNIS number provided on ISDN lines, and then search on the domain name. This is equivalent to issuing the **vpdn search-order dnis domain** command.

Command Modes

Global configuration

Command History

Release	Modification
11.3	This command was introduced.
12.2(13)T	Support for the **multihop-hostname** option was added to Cisco IOS Release 12.2(13)T.
12.2(28)SB	Support for the **multihop-hostname** option was added to Cisco IOS Release 12.2(28)SB.

Usage Guidelines

To issue the **vpdn search-order** command, you must include at least one of the search parameter keywords. You may enter multiple keywords, and they can be entered in any order. The order of the keywords specifies the order of precedence given to the search parameters. If you do not issue a particular keyword, no search will be performed on that parameter.

Issue the **multihop-hostname** keyword only on a device configured as a multihop tunnel switch.

The configuration shows the **vpdn search-order** command setting only if the command is explicitly configured.

Examples

The following example configures a NAS to perform tunnel authorization searches based on DNIS number only:

```
vpdn search-order dnis
```

The following example configures a tunnel switch to select a tunnel destination based on the multihop hostname first, then on the domain name, and finally on the DNIS number:

```
vpdn search-order multihop-hostname domain dnis
```

Related Commands

Command	Description
multihop-hostname	Enables the tunnel switch to initiate a tunnel based on the hostname or tunnel ID of the ingress tunnel.
vpdn multihop	Enables VPDN multihop.