

14 Routing Domains

Introduction

A routing domain is a collection of IP router interfaces that can forward packets within the domain. Domains cannot forward packets to one another. Routing domains give network administrators the ability to control which subnets are able to communicate and what paths they must follow to do so.

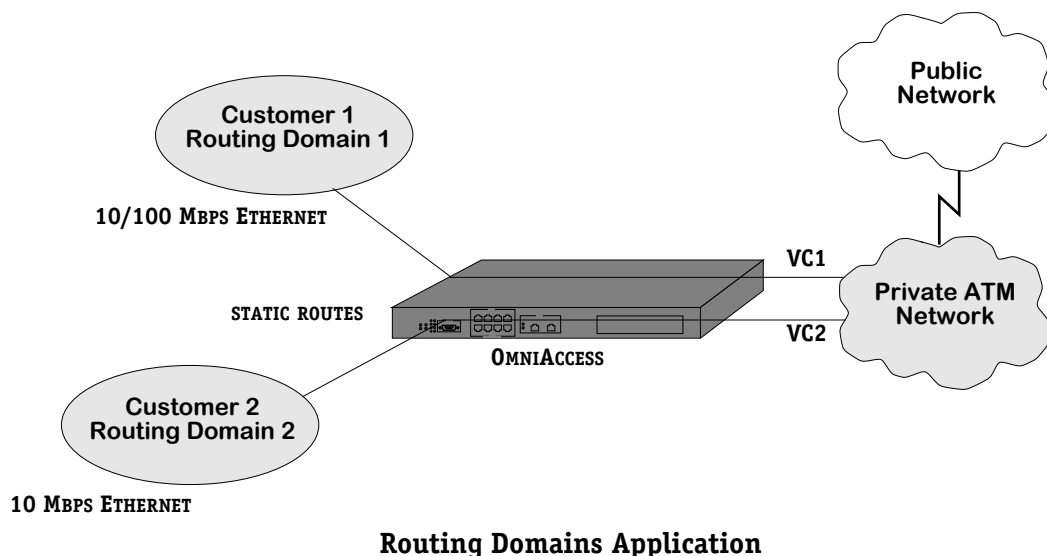
Routing domains are currently supported on the OmniAccess 408 and OmniAccess 512. By default the switch has a single routing domain. All IP interfaces that are not configured for any other routing domain are considered part of the default domain. Each domain is identified by a 32-bit unsigned integer called a Routing Domain Identifier (RDID). The default domain's RDID is zero (0).

When multiple routing domains are configured on the switch, static routes no longer have a global scope; that is, static routes apply to a particular routing domain on the switch and not the entire switch.

Each routing domain may have an associated default route. If a packet cannot be routed using any of the other routes configured for the domain, the default route is used. If a default is not configured, and none of the domain's routes apply, the packet will be discarded. Routes configured for other routing domains on the switch are not used to route the packet.

The route is unique to the domain but not to the switch. That is, other domains on the switch may use the same static route. Each domain uses different address spaces. The static route configured for more than one domain will use a different physical route. In this release, static routes for routing domains may be configured or removed using the **aisr** or **risr** commands (see the "IP Routing" chapter of your switch user manual for information about these commands).

A typical example application for routing domains would be a service provider that requires Ethernet for each customer with routes to an ATM network that is connected to the Internet.



Routing Domains and RIP

The Routing Information Protocol (RIP) in the base switch code is not supported with routing domains. If you are running RIP and then configure routing domains on the switch, the switch must be rebooted. Once the switch is rebooted, the RIP process will not be started.

Routing Domains and GateD

GateD, which is part of the Advanced Routing software and is not part of the base code, is currently not supported with routing domains. If GateD is running on the switch, routing domains cannot be configured. If routing domains are configured on the switch, and the GateD image file and configuration files are loaded onto the switch, the GateD process will not be started.

Routing Domains UI Overview

The Routing Domain Management submenu is available from the Networking menu. The Networking menu is described in the “IP Routing” chapter of your switch user manual. For general information about the UI, see your switch user manual.

To display the Routing Domains menu, enter **rd** at the system prompt. If the UI is configured for verbose mode, the submenu automatically displays. If the UI is configured for terse mode, enter a **?** to display the submenu.

Command	Routing Domains Menu
rdadd	Add a Routing Domain
rdaddi	Add Interface(s) to a Routing Domain
rd del	Delete a Routing Domain
rd deli	Delete Interface(s) from a Routing Domain
rdglobal	Global Routing Domain Configuration
rdmod	Modify a Routing Domain
rdview	View Configuration of Routing Domain(s)

Main	File	Summary	VLAN	Networking
Interface	Security	System	Services	Help

The following sections of this chapter describe how to use these commands. An overview of configuration for routing domains is given in *Configuration Overview* on page 14-4.

Configuration Overview

An overview of basic configuration for routing domains is given here.

Step 1. Set Up Routing Domains

By default, one routing domain exists on the switch and is the default routing domain into which a new interface, or group, is placed (unless you specify otherwise). The default routing domain has an RDID of 0. Use the **rdadd** command to add routing domains to the switch configuration. A routing domain must be configured with this command before you can associate interfaces with the domain. The **rdadd** command is described in this chapter.

Step 2. Configure Interfaces for Routing Domains

Groups may be configured for routing domains when you add a routing domain through the **rdadd** command, or for an existing routing domain, through the **rdaddi** command (which is described in this chapter). A group may also be configured for a particular routing domain when the group is created through the **crgp** command. See the “Groups and Ports” chapter of your switch user manual for information about the **crgp** commands.

Step 3. Add Static Routes to Routing Domains

Routes may be added to routing domains through the **aisr** command. Routes may be deleted from routing domains through the **risr** command. See the “IP Routing” chapter of your switch manual for more information about these commands.

Adding a Routing Domain

Use the **rdadd** command to add a new routing domain. The screen display is similar to the following:

```

Add a Routing Domain

1) Routing Domain ID (RDID)      : 1
2) Default Gateway               : None
3) ICMP Access Allowed           : Enabled
4) FTP Access Allowed            : Disabled
5) TELNET Access Allowed         : Disabled

Command {Item=Value/?/Help/Quit/Redraw/Save} (Redraw) :
```

The parameters are described as follows:

Routing Domain ID

A 32-bit integer that uniquely identifies the routing domain. By default the displayed value is the next sequential unused number. An unlimited number of routing domains may be defined, but in actual application domains are limited by the number of router ports defined on the switch.

Default Gateway

Determines the default gateway used by the indicated routing domain. Used as the next hop for the default route.

ICMP Access Allowed

Configures whether ICMP access is allowed for the indicated routing domain. By default, ICMP access is enabled or disabled depending on the global setting for Switch Access Allowed configured through the **rdglobal** command on the Global Routing Domain Configuration screen. See *Configuring Global Parameters for Routing Domains* on page 14-7 for more information about this command. When this parameter is set to **Disabled**, any ICMP packets destined for this routing domain will be discarded. When this parameter is set to **Enabled**, any ICMP packets for the routing domain are accepted on the switch.

FTP Access Allowed

Configures whether FTP access is allowed for the indicated routing domain. By default, FTP access is disabled, which means that any FTP packets destined for this routing domain will be discarded. When this parameter is set to **Enabled**, any FTP packets for the routing domain are accepted on the switch.

TELNET Access Allowed

Configures whether Telnet access is allowed for the indicated routing domain. By default, Telnet access is disabled, which means that any Telnet packets destined for this routing domain will be discarded. When this parameter is set to **Enabled**, any Telnet packets for the routing domain are accepted on the switch.

To add a new routing domain:

1. On the Add a Routing Domain screen, change any of the relevant parameters. For example, if you want this routing domain to allow Telnet access, you would enter

5=e

The screen redraws with TELNET Access set to **Enabled**.

2. Enter **s** to save the change(s). A message displays similar to the following:

RD 1 has been created.

Do you wish to configure the Group:Vlans for this RD at this time? (y)

If you want to associate groups/VLANs with the routing domain at this time, the groups/VLANs must already be configured on the switch through the **crgrp** command. If the groups/VLANs are not yet set up, enter **n** at this prompt. Groups/VLANs may be associated with the routing domain later through the **rdaddi** command, or when you set up groups/VLANs during the **crgrp** procedure. See the “Groups and Ports” chapter of your switch user manual for info about the **crgrp** command.

3. To configure groups and VLANs for this routing domain, press **<Enter>**. The following message and prompt display:

**Initial GP:Vlans - Specify a range of GP:VLANs and/or a list
as in 2:1-2, 3:1, 4.**

Initial GP:Vlans:

4. Enter the relevant group and VLAN ID. For example:

2:4

A message similar to the following displays:

2:4 has been added to RD 1.

You may add/remove interfaces to/from this RDID using the `rdaddi` and `rddeli` commands at a later date if you choose.

The group:VLAN pair (interface) is now configured for the routing domain.

Deleting a Routing Domain

To delete a routing domain, use the **rddel** command with the relevant RDID. For example, if you want to delete routing domain 6, enter the following:

rddel 6

A screen displays similar to the following:

**This will delete the configuration for RDID: 6
All interfaces will be deleted and returned to the default Routing Domain.
Continue: {(Y)es, (N)o} (n) :**

Enter **y** to delete the routing domain. The system prompt redisplay.

Adding Groups and VLANs to a Routing Domain

To add interfaces (groups/VLANs) to an existing routing domain, use the **rdaddi** command with the relevant RDID and group:VLAN ID. The routing domain must already be created on the switch through the **rdadd** command, and the group:VLAN must also be valid on the switch. For example, to associate group 1, VLAN 2 to routing domain 2, enter the following:

rdaddi 2 1:2

A message displays similar to the following:

1:2 has been added to RD 2.

Deleting Interfaces From a Routing Domain

To delete interfaces from a routing domain, use the **rddeli** command. For example:

rddeli 1 2:1

A message similar to the following displays:

Delete GP:Vlan '2:1' from RD 1? {(Y)es, (N)o} (n):

Enter **y** to delete the interface from the routing domain.

Configuring Global Parameters for Routing Domains

To configure global parameters for routing domains, use the **rdglobal** command.

Global Routing Domain Configuration

- 1) Switch Access Allowed : Disabled
- 2) Output Routing Domain ID (RDID) : 0

Command {Item=Value/?/Help/Quit/Redraw/Save} (Redraw) :

The parameters are described as follows:

Switch Access Allowed

Configures the default ICMP access for new routing domains on the switch. The default may be changed for individual routing domains during the add process through the **rdadd** command, or by modifying a routing domain through the **rdmod** command.

Output Routing Domain ID

Configures the Routing Domain ID (RDID) to be used when making routing decisions for packets that are originated on the switch. By default this value is set to zero, which means that the default domain's routing table will be used. *If you set this value to any other RDID, that routing domain's routing table will be used when the switch issues a ping, or initiates a Telnet or FTP session.*

Modifying a Routing Domain

To modify an existing routing domain, enter the **rdmod** command and the relevant RDID. For example:

```
rdmod 5
```

The screen displays similar to the following:

Modify Routing Domain 5

- 1) Routing Domain ID (RDID) : 5
- 2) Default Gateway : None
- 3) ICMP Access Allowed : Enabled
- 4) FTP Access Allowed : Disabled
- 5) TELNET Access Allowed : Disabled

Command {Item=Value/?/Help/Quit/Redraw/Save} (Redraw) :

The parameters are defined in *Adding a Routing Domain* on page 14-4. To modify any of the parameters, enter the relevant parameter number, an equal sign, and the desired value. When you are finished making changes, enter **s** to save the changes. The system prompt redisplay.

Viewing Routing Domain Configuration

Use the **rdview** command to view the current Routing Domains configuration. You can view the configuration for all routing domains on the switch or for an individual domain. The information displayed for an individual domain can also display the IP forwarding table for the domain.

Routing domains are added to the configuration through the **rdadd** command or deleted from the configuration through the **rd del** command. (See *Adding a Routing Domain* on page 14-4 and *Deleting a Routing Domain* on page 14-6 for more information about these commands.)

Viewing All Routing Domains

To display the configuration for all routing domains, enter the **rdview** command. The screen displays similar to the following:

Routing Domains (RDID = Routing Domain ID)			
RDID	Associated GP:VLs	Default Gateway	Switch Access
=====	=====	=====	=====
2	2:1, 3:2	11.2.3.5	ICMP

The parameters are defined as follows:

RDID. The ID of the routing domain.

Associated GP:VLs. The group and VLAN ID of the interfaces associated with the routing domain. Interfaces may be added to the routing domain through the **rdaddi** command or deleted from the configuration through the **rd deli** command. For more information about these command, see *Adding Groups and VLANs to a Routing Domain* on page 14-6 and *Deleting Interfaces From a Routing Domain* on page 14-6.

Default Gateway. The default route configured for the routing domain. This parameter may be changed through the **rdmod** command (see *Modifying a Routing Domain* on page 14-7).

Switch Access. The type of access enabled for the routing domain (ICMP, FTP, or Telnet). The switch access may be changed through the **rdmod** command (see *Modifying a Routing Domain* on page 14-7).

Viewing Information for a Particular Routing Domain

To display the configuration for a particular routing domain, enter the **rdview** command with the desired RDID. For example:

```
rdview 1
```

The screen display is similar to the following:

```

Routing Domain 1
GP:Vlans ..... 3:1 4:1
Default Gateway ..... 33.0.0.254
ICMP Access ..... Enabled
FTP Access ..... Disabled
TELNET Access ..... Disabled
Number of Routes ..... 3

Do you want to see the current forwarding table? (y or n) (y):
3 routes in forwarding table

```

IP FORWARDING TABLE for Routing Domain 1

Network	Mask	Gateway	Metric	Group:VLAN Id	Protocol
0.0.0.0	255.0.0.0	33.0.0.254	1	4:1	STATIC
33.0.0.0	255.0.0.0	33.0.0.218	1	4:1	DIRECT
44.0.0.0	255.0.0.0	44.0.0.218	1	3:1	DIRECT

The parameters are defined as follows:

Network. The destination network IP address.

Mask. The IP subnet mask for the destination address.

Gateway. The address of the gateway for the route (the router from which the route was learned).

Metric. The hop count associated with the network (the number of hops between the network and the gateway).

Group:VLAN Id. The group and VLAN ID on which the network address was learned.

Protocol. Indicates how the route was entered into the table. **STATIC** displays for routes that were entered manually through the **aisr** command. **DIRECT** displays for routes that are learned by the switch.

