# Managing Router Interface Configurations

This chapter explains how to manage router interfaces on Cisco Systems Universal Broadband Routers (uBRs) that manage cable modem termination systems (CMTSs).

Router Interface Configurations

The regional Router Interface Configuration (RIC) server is used to manage router interfaces on Cisco Systems Universal Broadband Routers (uBRs) that manage cable modem termination systems (CMTSs). This module interacts with the CMTS servers to push the required cable modem configuration to edge devices, such as routers and switches (see the image below). The RIC server module is accessible only if you are assigned the ric-management subrole of the cfg-admin or central-cfg-admin role.

Figure 1: Router Interface Configuration (RIC) Server Module
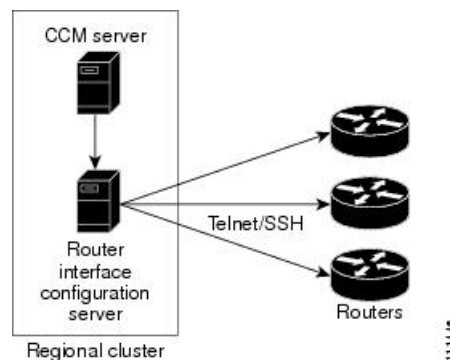
Tip   Add routers before you add any other subnets. This prevents the subnets that the router creates from possibly overlapping with those explicitly added, and prevents router synchronization errors later on.

The view of the routers is available on the View Tree of Routers page. The tree levels are the routers, their router interfaces, and any child interfaces. Parent/child relationships can be either physical/virtual (as in Cable2/0 and Cable2/0.1) or primary/secondary (as in router interface bundling, where the bundle is identified by one of the interfaces; see Bundling Interfaces, on page 5). This listing of router interfaces is available only after you create routers in the system and synchronize with them.

Managed Versus Virtual Routers

Managed routers are updated in the database as well as being physically updated and synchronized. When you edit a managed router, the router is also automatically updated and synchronized with the newest data.

Virtual routers are updated in the Cisco Prime Network Registrar database only. However, you can create, push, and reclaim subnets for a virtual router. You might define a virtual router when the RIC server cannot directly manage the router, but the virtual router should still be considered part of the topology.

You can define a virtual router by omitting the router type or connection credentials on the Add Router page or Edit Router page.

Secure Mode Connections with Routers

To enable secure communication between the RIC server and the routers, you must have the Cisco Prime Network Registrar Communications Security Option Release 1.1 installed. By default, secure connectivity is disabled and accessible over Telnet. However, you can specify whether you require or desire a Secure Shell (SSH) connection. Use the *use-ssh* attribute in the (expandable) Reserved attributes section of the Edit Router page. This attribute has the following values:

- **disabled** (preset value)—Uses simple Telnet for the connection.
- **required**—The router communicates with the edge device using SSH only, and not Telnet.
- **desired**—The router tries to communicate using SSH, but if it cannot, it uses Telnet.

Note The SSH server should be set up so that the key length (modulus) is at least 1024 bits, using, for example, the command **crypto key generate rsa general-keys modulus 1024**.

Alternative Login Method to Routers

There are two types of login mechanisms provided in the RIC server that you can affect using the *login-template* attribute on the Add Router page:

- **Discovery mode**—The default mechanism, designed to understand login prompts on edge devices and respond to those dynamically. It does not force a particular login sequence, but supports the various login sequences and login prompts most customers use with these default prompts:

```
Username prompt - Username:
Password prompt - Password:
Login-prompt - >
Enable password prompt - Password:
Enable prompt - #
```

- **Template mode**—Use this in case the RIC server cannot log in using the discovery mechanism for some reason, such as nonstandard prompts or a login sequence that the discovery mechanism does not understand. The *login-template* is the name of an optional login template to use to further customize the RIC server login and enable interactive sessions. To create this template you must:

1. In the API, create an ScpObj of class CCMRouterLoginTemplate.
2. Add the object to the database using the RICAdminSession.addRouterLoginTemplate method.
3. Enter the name of the added template (CCMRouterLoginTemplate.name) as the value of the *login-template*.

Creating a Login Template

Local and Regional Advanced Web UI

Step 1 From the **Deploy** menu, choose **Login Templates** under the **Router Configuration** submenu. This displays the List/Add Router Login Templates page.

Step 2 Click the **Add Login Template** icon to open the Add Login Template page.

Step 3 Enter the desired name for the template in the Name field, the desired string value to be used as the login prompt by the router in the login-prompt field, and the desired string value to be used as the prompt by the router in enable mode in the enable-prompt field.

Step 4 Click **Add Login Template** to add the template or click Cancel to return to the List/Add Router Login Templates page.

Adding Routers

The routers that the RIC server manages can be Cisco Universal Broadband Routers in the family uBR72*xx* and uBR10*xxx* . (For an example of adding a router, see Add a Router and Modify an Interface.)

Local Advanced and Regional Web UI

Step 1 From the **Deploy** menu, choose **Router List** under the **Router Configuration** submenu. This opens the List/Add Routers page.

Step 2 Click the **Add Router** icon. This opens the Add Router page.

Step 3 You can set a router to managed or virtual (see Managed Versus Virtual Routers, on page 2). If the router is managed, you must enter its type and IP address. The selections for the Type field are **Ubr72xx** or **Ubr10k**. If managed, you also need to check with the router administrator about the username, password, and enable password, and enter these values in the Edit Router page, later.

Step 4 Click **Add Router**.

CLI Commands

Add a router using **router** *name* **create**. For example:

```
nrcmd> router router-1 create 192.168.121.121
```

Related Topics

Editing Routers

Editing routers involves modifying some of the router attributes.

Local Advanced and Regional Web UI

Click the router name in the Router Tree pane or Router List pane on the left. In the Edit Router page, you can enter values for the different attributes. Additionally, you can use the **Unset** checkbox also to disable the attributes. Make your changes, then click **Save**.

CLI Commands

Edit a router attribute using **router** *name* **set** *attribute* . For example:

```
nrcmd> router router-1 set owner=owner-1
```

Resynchronizing Routers

As soon as you add the router to the regional cluster, it is synchronized over the network. You can also explicitly resynchronize the router if you know that changes occurred. On the List/Add Routers page, click the **Resynchronize** icon at the top of the page. If the synchronization could not occur or timed out, you get an error message to that effect.

Viewing and Editing the Router Interfaces

Editing a router interface involves modifying some of its attributes.

Local Advanced and Regional Web UI

If you click the **Interfaces** tab associated with the router on the List/Add Routers page, the list of related cable or Ethernet interfaces appears. Both from this page and the Router Tree pane on the left, you can click the interface name to edit it. The Interfaces tab also contains the option to delete the interface (click the **Delete** icon corresponding to the interface). Editing the interface also includes an additional attribute **Unset** function.

You can add, edit, or delete interfaces for virtual routers without restrictions. There are restricted attributes for managed routers, described in the Changeable Router Interface Attributes, on page 5.

CLI Commands

Edit a router interface attribute using **router-interface** *name* **set** *attribute* . For example:

```
nrcmd> router-interface Ethernet1/0 set ip-helper=192.168.121.122
```

Related Topics

Changeable Router Interface Attributes, on page 5

Bundling Interfaces, on page 5

Changeable Router Interface Attributes

If you are editing the attributes of the router interface, you cannot change the name, state, or MAC address of the interface on this page. However, you can change the following attributes:

- Description
- Address of the primary subnet address on the interface
- Addresses of the secondary subnets on the interface
- Address of any IP helper (DHCP relay agent) for the interface
- Address of any cable helper of the DHCP server to accept unicast packets for the interface

Bundling Interfaces

An interface bundle provides load balancing among the router interfaces. When you define a bundle, all the participating interfaces in the bundle must have the same bundle identifier (ID), which is the name of the interface specified as the master.

If you want to use bundling, the following attributes are in the Interface Bundling Settings section of the Edit Router Interface page, or set them using the **router-interface** command in the CLI:

- ***bundle-id***—Interface bundle identifier, the name of the master interface. All participating interfaces in the bundle must have the same bundle ID.
- ***is-master***—This interface is the master interface in the bundle.
- ***is-virtual***—This interface is a virtual interface in the bundle.

Pushing and Reclaiming Subnets for Routers

You can push subnets to, and reclaim subnets from, a router interface (see the *"Reclaiming Subnets" section in Cisco Prime Network Registrar 8.3 DHCP User Guide*). When you push or reclaim a subnet with a managed or virtual router, all primary and secondary relationships that are set for the router are also set for the related subnets and scopes.