BCM50 Rls 6.0

Router IP Routing

Task Based Guide

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IP Routing

Overview

The BCM50 Integrated Routers provide routing capability to other networks. Data traffic from the LAN side can be forwarded to other networks – and vice-versa - via routing information stored on the BCM50 Integrated Router. The routing information can be specified in two ways:

- Routing Information Protocol (RIP) – routers communicate using this protocol informing each other of networks connected to them. Useful for medium-sized variable networks
- Static Routes – the system administrator manual inputs desired paths to other networks. Used for small networks where the network doesn't change often. However, if the physical path to other networks fails, there is little or no backup route facilities

When routes are calculated, a "cost" can be apportioned to each route. This "cost" is termed a metric. Metrics are automatically calculated via RIP, or can be set by the system administrator when creating a static route. The purpose of metric calculation is to ensure that data traffic is routed via the most efficient path.

Note: This guide relates to the BCM50a/ba and BCM50e/be models only.

Note: Although the BCM50a/ba models will not be supplied with BCM 6.0, it is possible to upgrade the variants of these models to BCM 6.0, if they were originally supplied with BCM50 R2 or BCM50 R3 software.

Note: The BCM50 Integrated Router is almost identical to the Business Secure Router (BSR) models. BCM50a/ba routers are based on the BSR252 and BCM50e/be routers are based on the BSR222.

Routing Information Protocol (RIP)

BCM50 Integrated Router supports RIP, a widely used protocol for managing routing information in a self-contained network, such as a corporate intranet. RIP measures the shortest path between two points on a network in terms of the number of hop between those points. The Internet Engineering Task Force (IETF) classifies RIP as one of several internal gateway protocols (IGPs).

A RIP router sends routing information updates, which list all the other hosts it knows about, to its nearest neighbor host every 30 seconds. The neighbor host sends the information to its next neighbor, until all the hosts in the network know the routing paths, a state known as network convergence. RIP uses a hop count to determine network distance. Each router in the network

uses the routing table information to determine the next host for the packet, until the required destination is reached.

BCM50 Integrated Router allows RIP to be enabled/disabled, and also the direction set against RIP information updates, i.e. RIP information can be sent to other routers, accepted from other routers, both sent and received, or turned off.

BCM50 Integrated Router supports two versions of RIP:

- RIP 1 – universally supported, probably adequate for most networks
- RIP 2 – offers more information than RIP 1, but you must check that other routers are compatible with this protocol

Enabling RIP on Network Interfaces

The BCM50 Integrated Router supports RIP on the following interfaces:

- LAN-side
- LAN IP Alias
- WAN-side

Therefore, the BCM50 Integrated Router can send (and/or receive) RIP information to other routers connected to the LAN (either on the same network range, or network ranges specified by IP Alias) and also to routers connected via its WAN port.

LAN-to-LAN Routing

BCM50 Integrated Router offers the IP Alias feature to provide up to 3 different network ranges via the same physical interface (essentially LAN ports). The BCM50 Integrated Router can be used to automatically route data traffic between any network range.

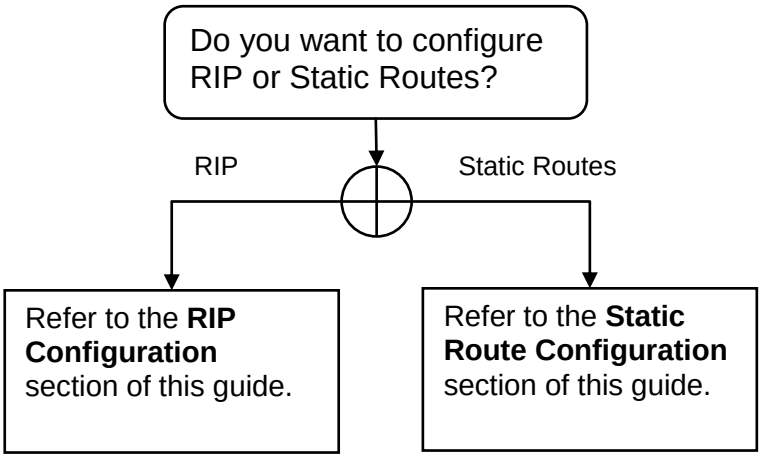
Required Information

Before configuring IP Routing, the following information is required:

- Which interfaces (LAN or WAN) are other routers likely to be connected to
- Which method of routing should be used: Static Routes or RIP
- If static, what are the IP Addresses of other immediately connected routers
- If using RIP, which version: RIP 1 or RIP 2
- If using RIP, are there any constraints as to the direction of RIP information transmissions

Flow Chart

The flow chart below shows which sections of the guide you should use.



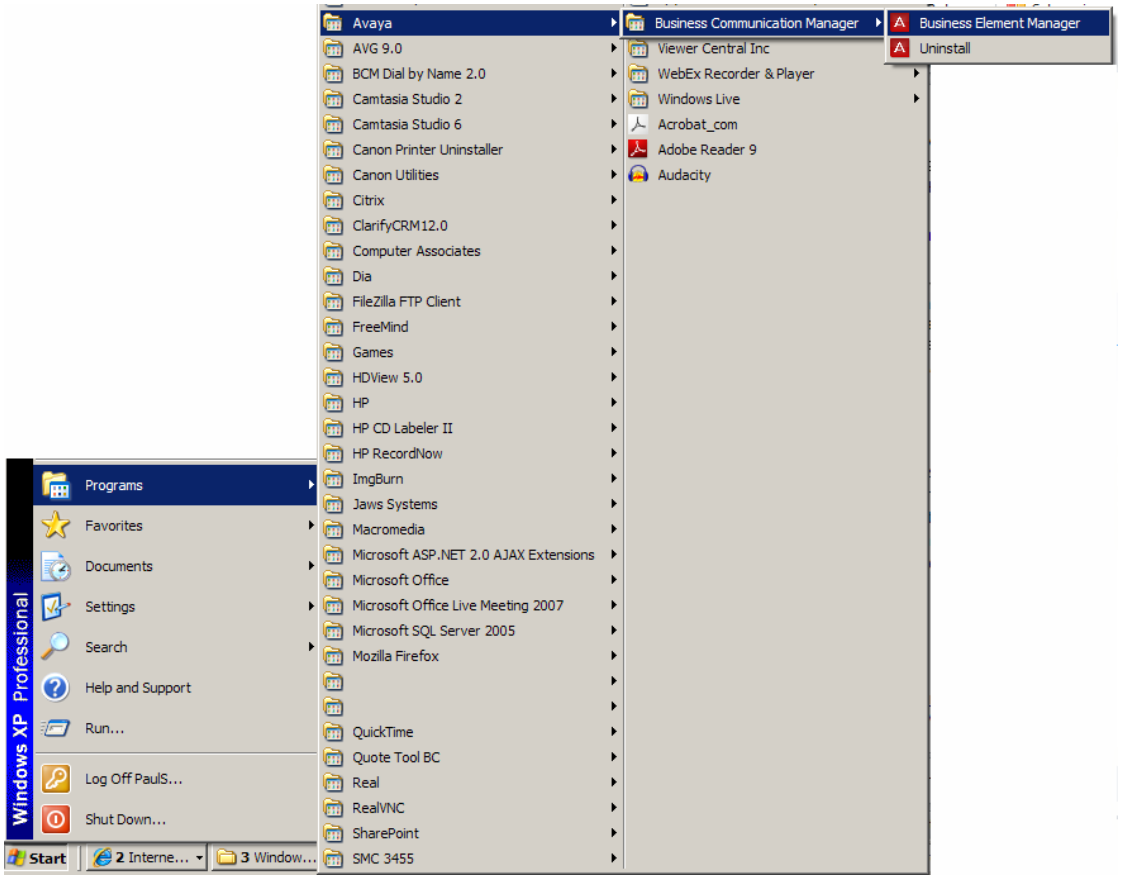
Accessing the Web Router GUI

There are two methods of accessing the Web Router GUI, independent on which model you are configuring:

- Via Element Manager (management application for all BCM50 models)
- Directly from a web browser

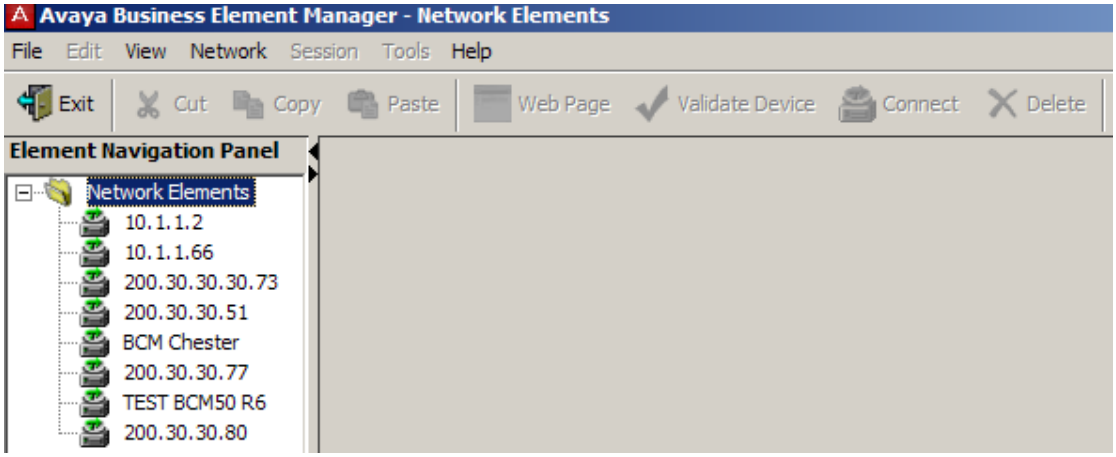
From Element Manager

1. To access the Business Element Manager application from the Start Menu, navigate to **Start**, **Programs**, **Avaya**, **Business Communications Manager**, **Business Element Manager**.

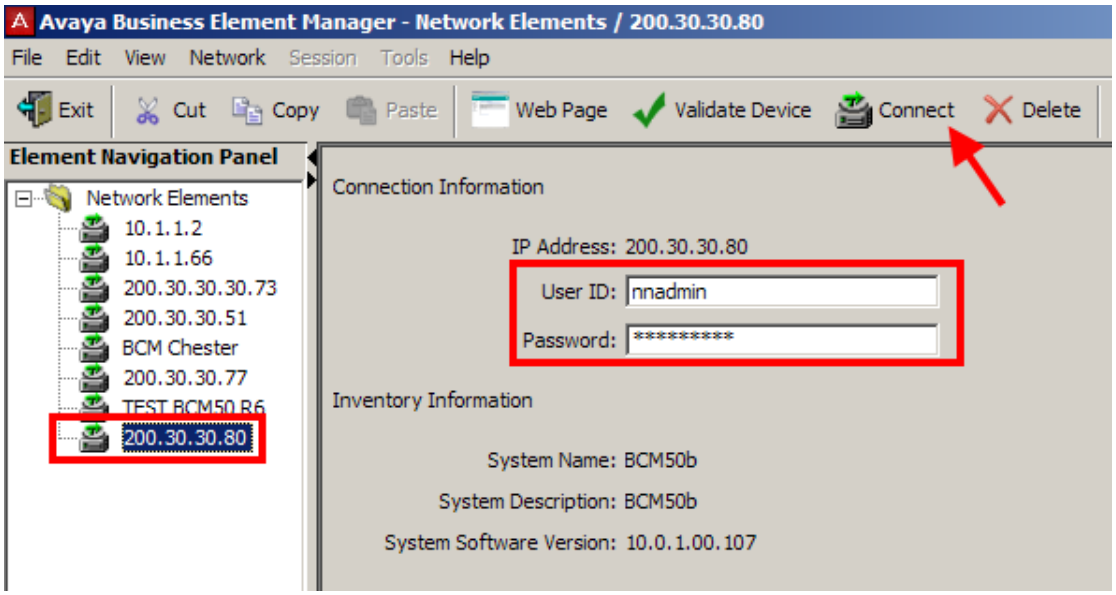


2. Alternatively, double-click on the **Business Element Manager** desktop icon.

3. You will be presented with the **Element Manager** interface.

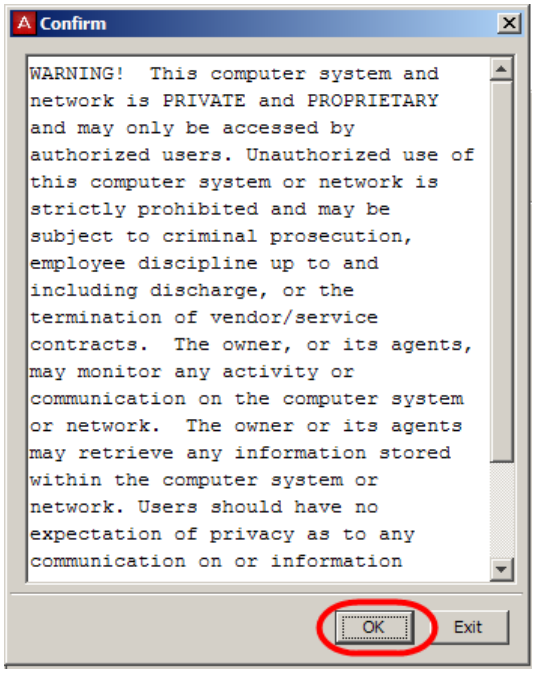


4. Open the **Network Elements** folder and select the IP Address of the BCM.

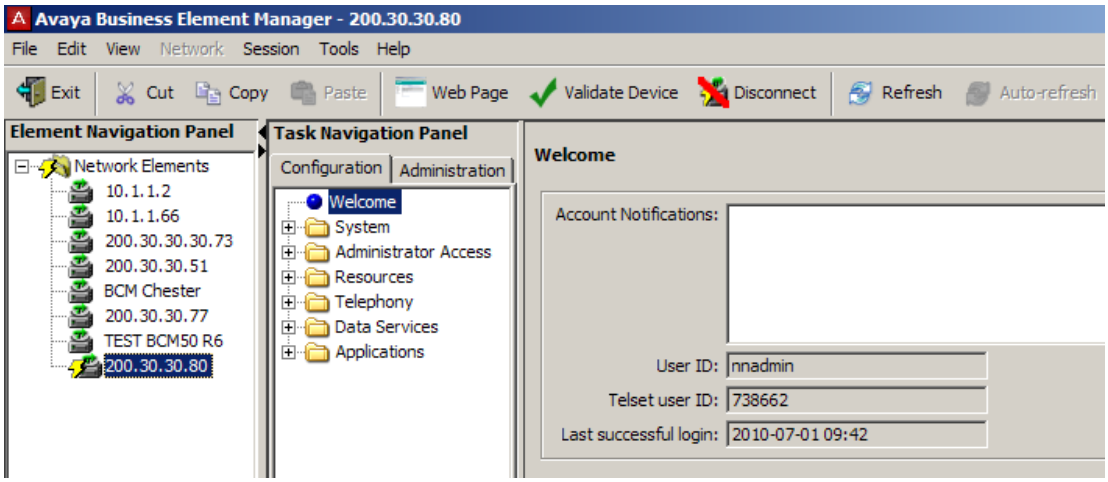


5. Enter the User Name of the BCM in the User Name field, by default this is **nnadmin**. Then enter the Password in the Password field, by default the password is **PlsChgMe!**. Click the **Connect** button.

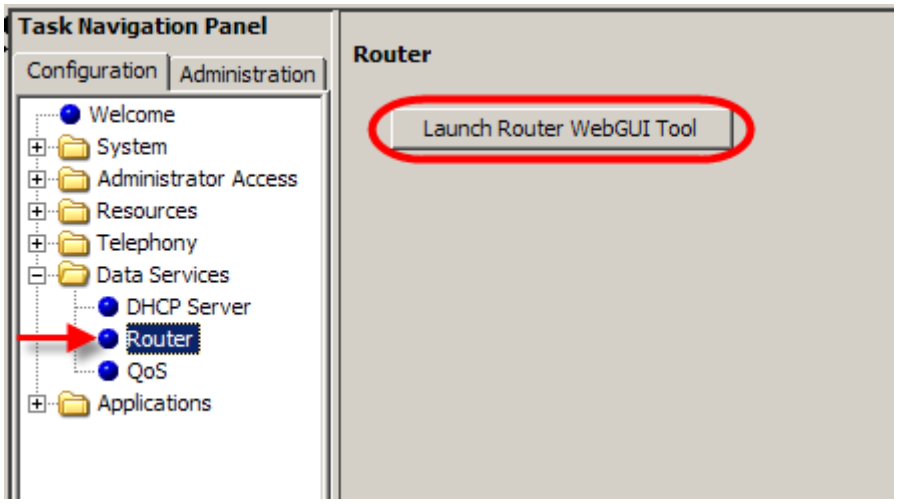
6. A warning screen will appear, read the warning and click **OK**.



7. You will be presented with the Element Manager interface.

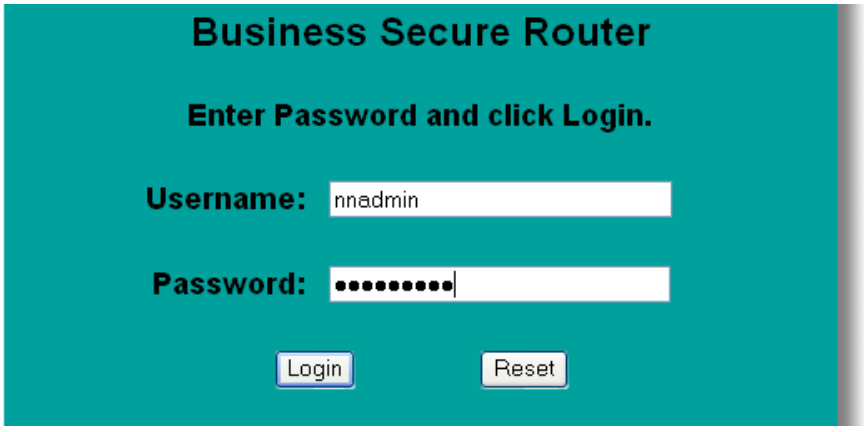


8. Click the **Data Services** link, select the **Router** link and click the **Launch Router Web GUI Tool** button.

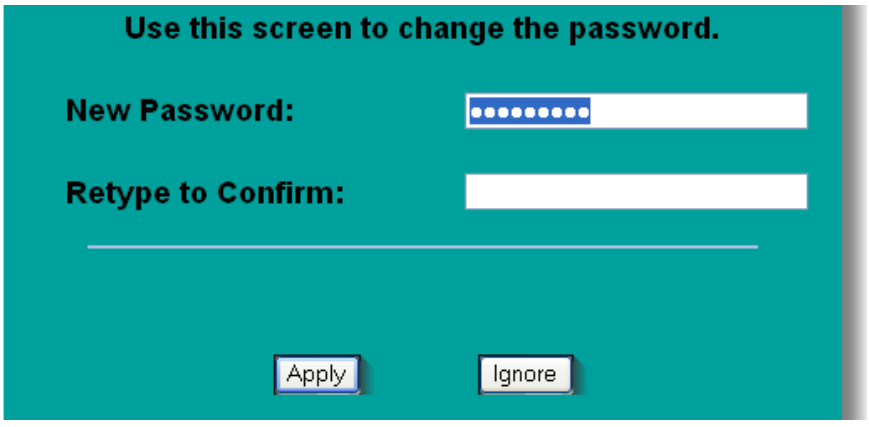


9. The Business Secure Router logon screen will be displayed. Enter the Username (default = **nnadmin**) and Password (default = **PlsChgMe!**) and click **Login**.

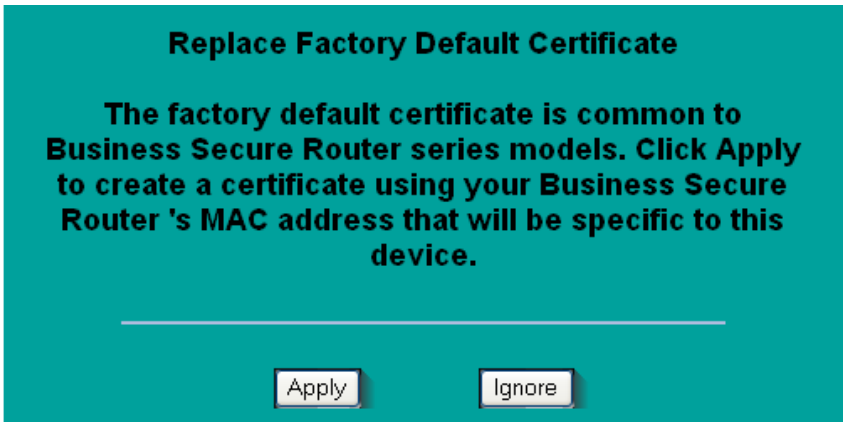
Note: if the above logon details do not work, try Username = **admin**, and Password = **setup.**



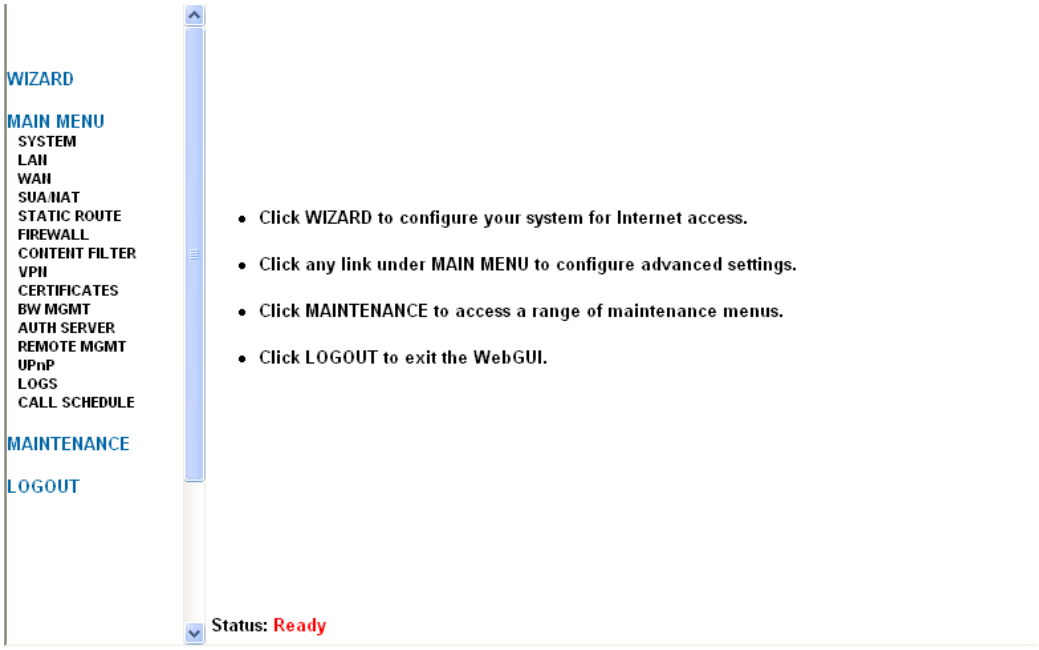
10. Change the password and click **Apply**, or click **Ignore** to continue.



11. To replace factory certificate click **Apply** or **Ignore** to continue.

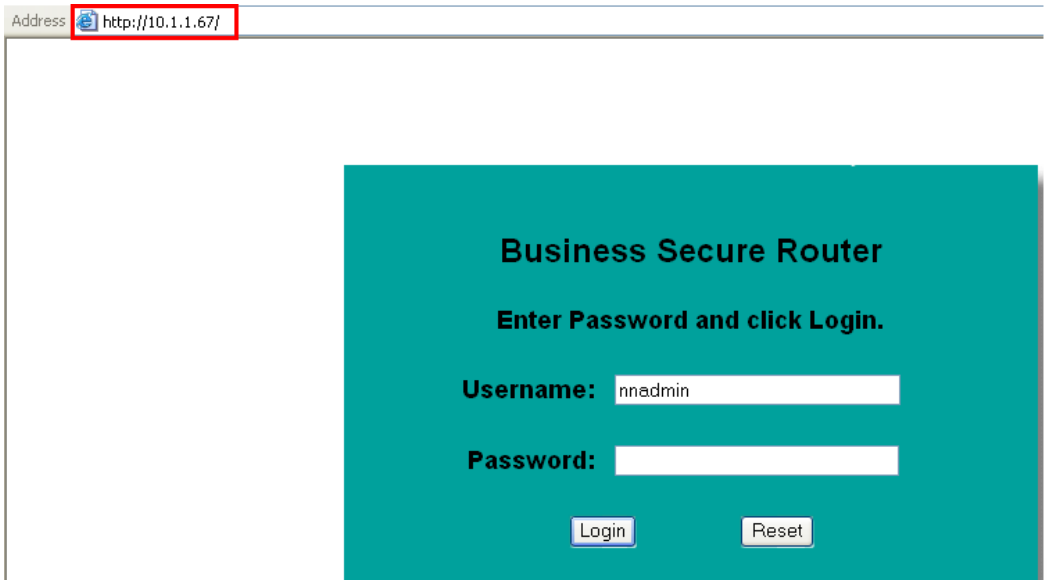


12. The Main Menu screen will display.



Access Directly via a Web Browser

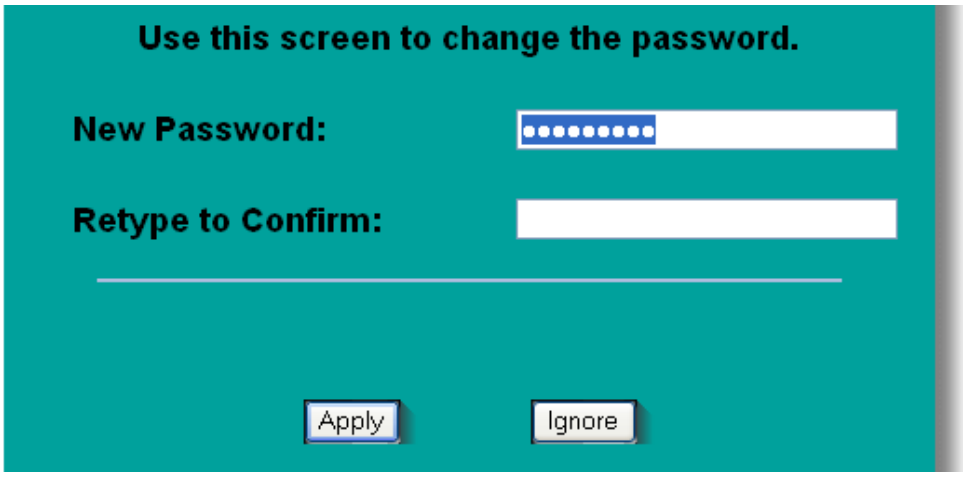
1. Open your web browser. In the address bar, type in **http://<router card LAN IP Address>/** and press **Enter**.



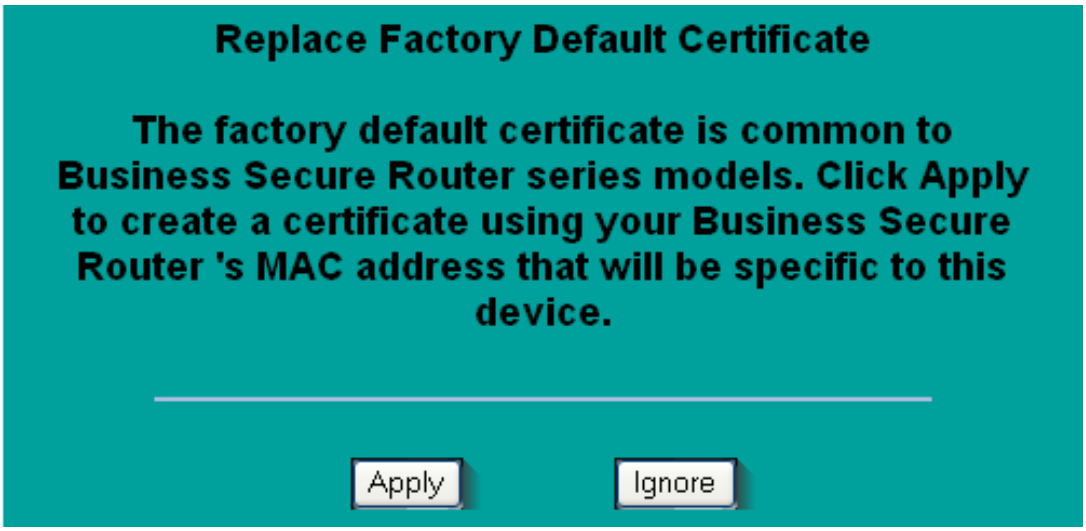
2. The Business Secure Router logon screen will be displayed. Enter the Username (default = **nnadmin**) Password (default = **PlsChgMe!**) and click **Login**.

Note: if the above logon details do not work, try Username = **admin** Password = **setup.**

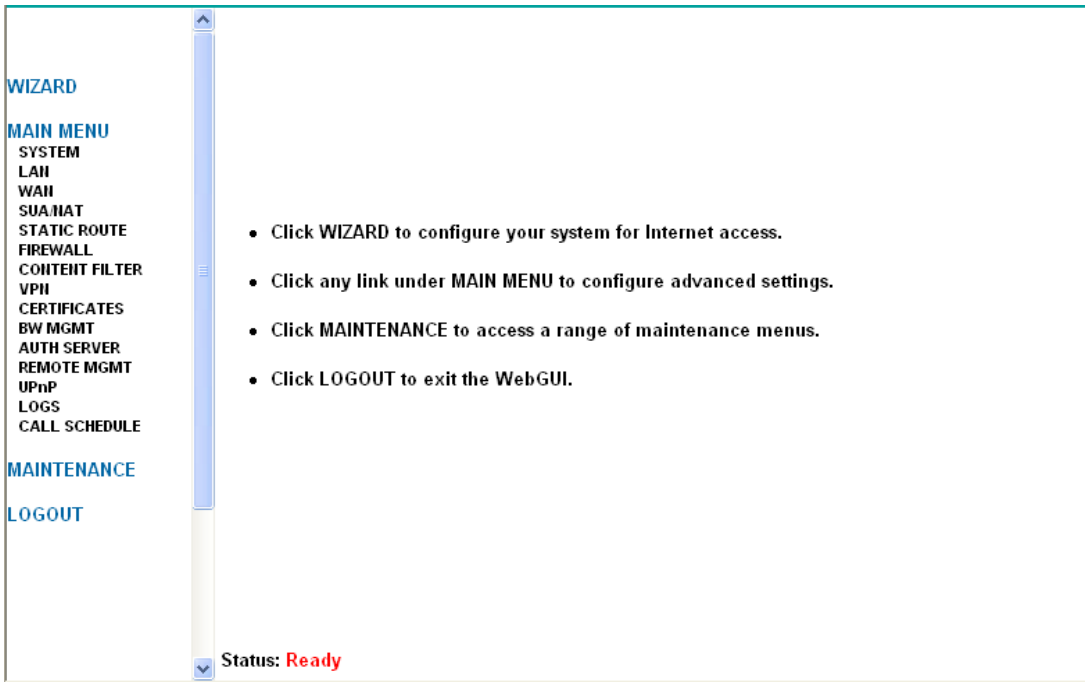
3. Change the password and click **Apply**, or click **Ignore** to continue.



4. To replace factory certificate click **Apply** or **Ignore** to continue.



5. The Main Menu screen will display.

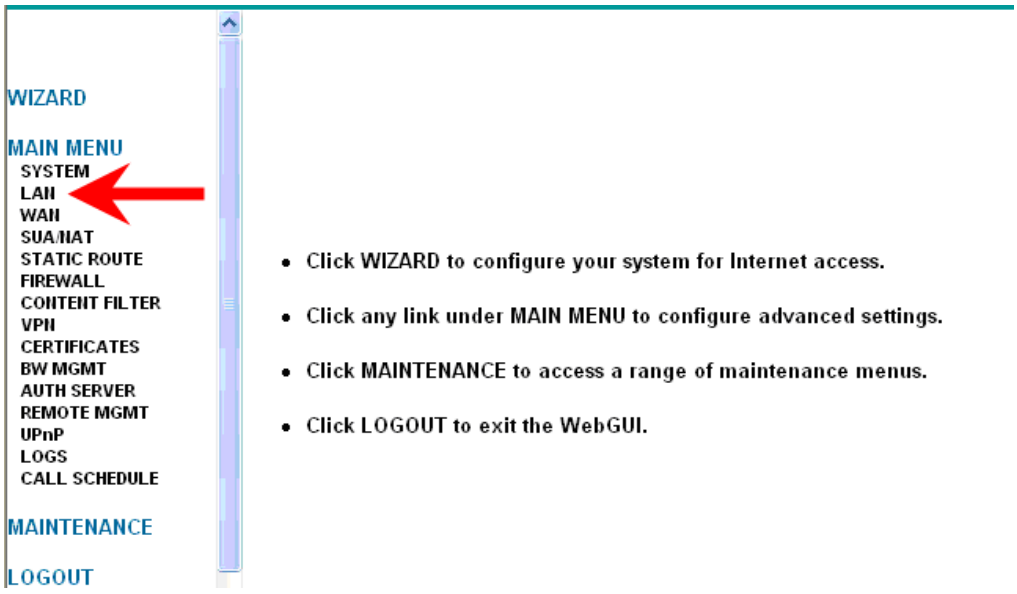


RIP Configuration

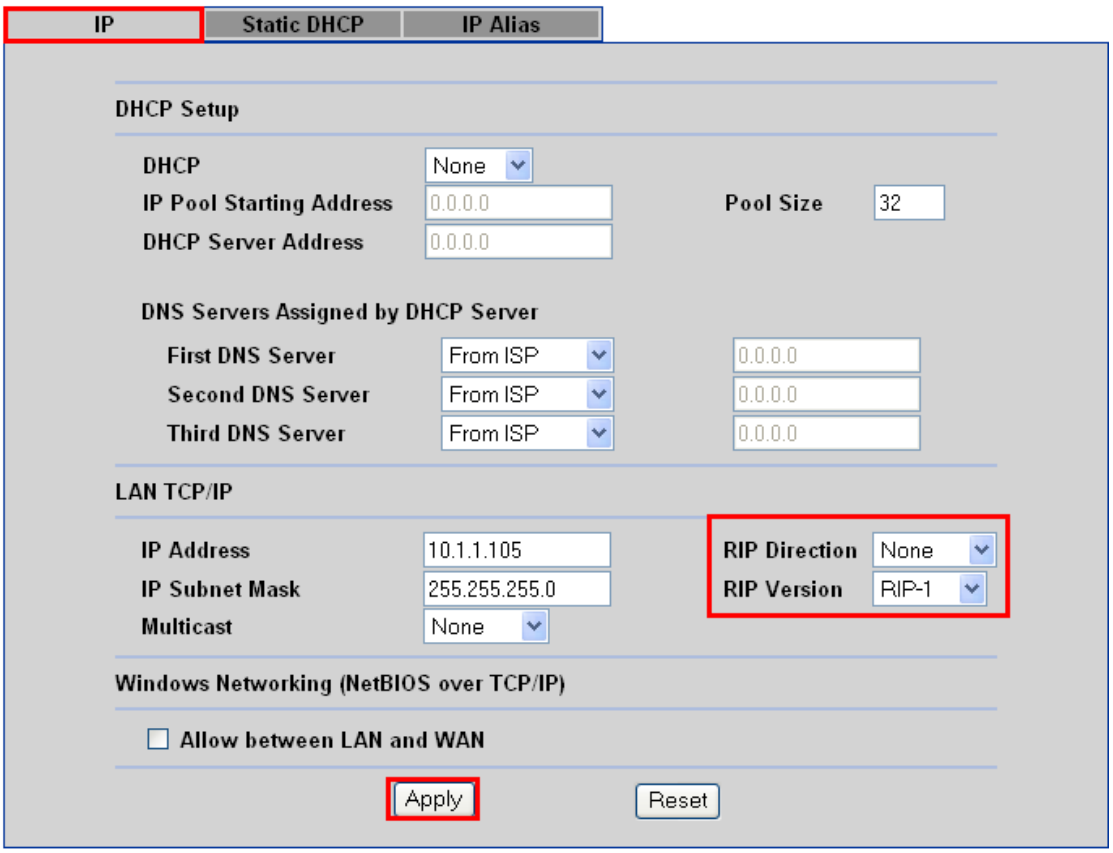
RIP is configured against the LAN, LAN IP Alias, and WAN interfaces. The following procedure explains how to set RIP on all of these interfaces. Omit any that are not required.

1. Access the Integrated Router Web Router GUI.

2. To configure RIP on the LAN/LAN IP Alias, select **LAN** from the main menu.



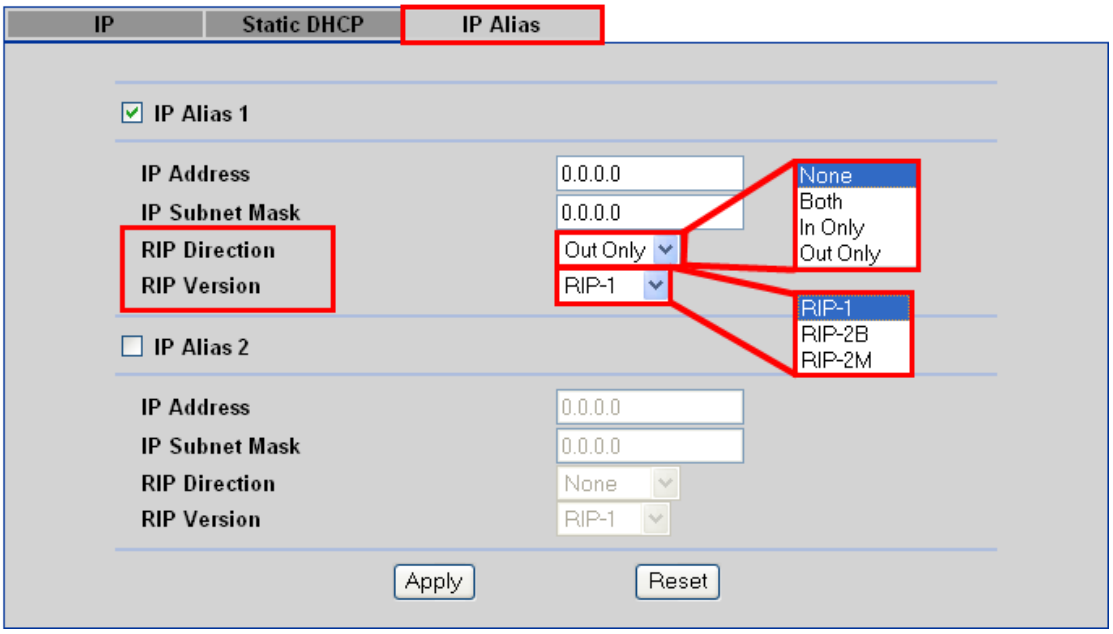
3. From the **IP** tab, set the **RIP Direction** and **RIP Version** as required.



4. Click **Apply** to save your settings.

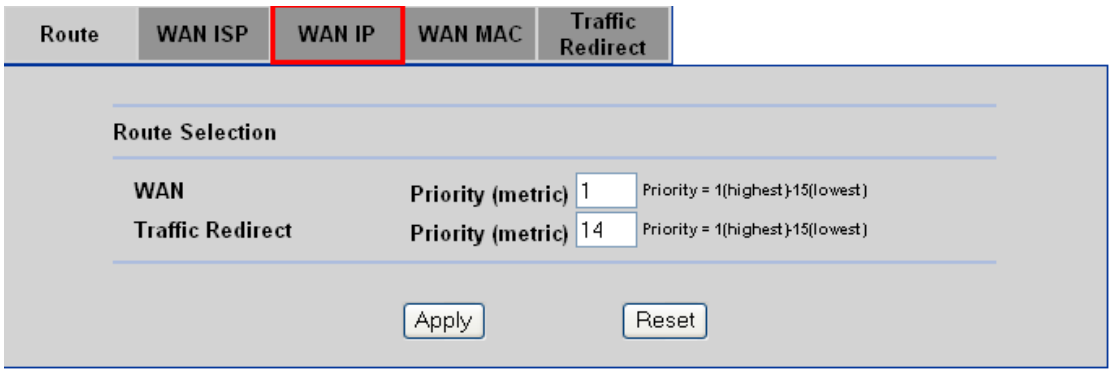
5. To set RIP for the IP Alias networks, click on **IP Alias**.

6. For any alias networks specified, set the **RIP Direction** and **RIP Version** as required.



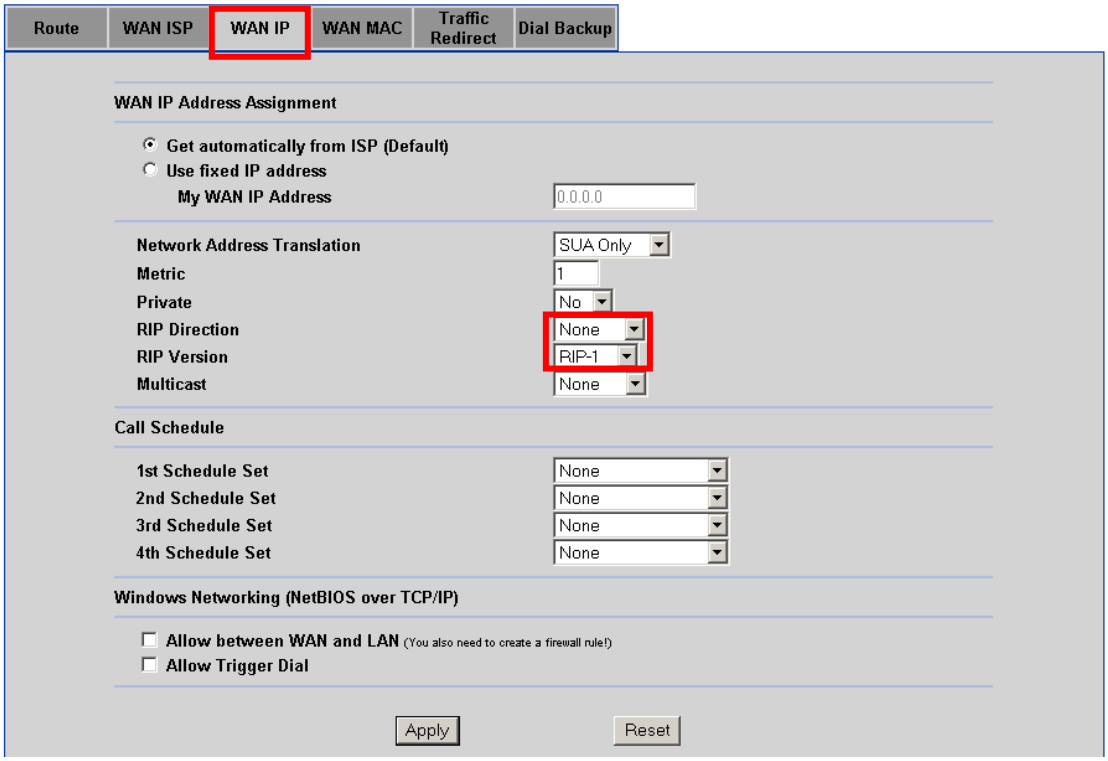
7. Click **Apply** to save your settings.

8. To set RIP against the WAN interface, select **WAN** from the left-hand menu.

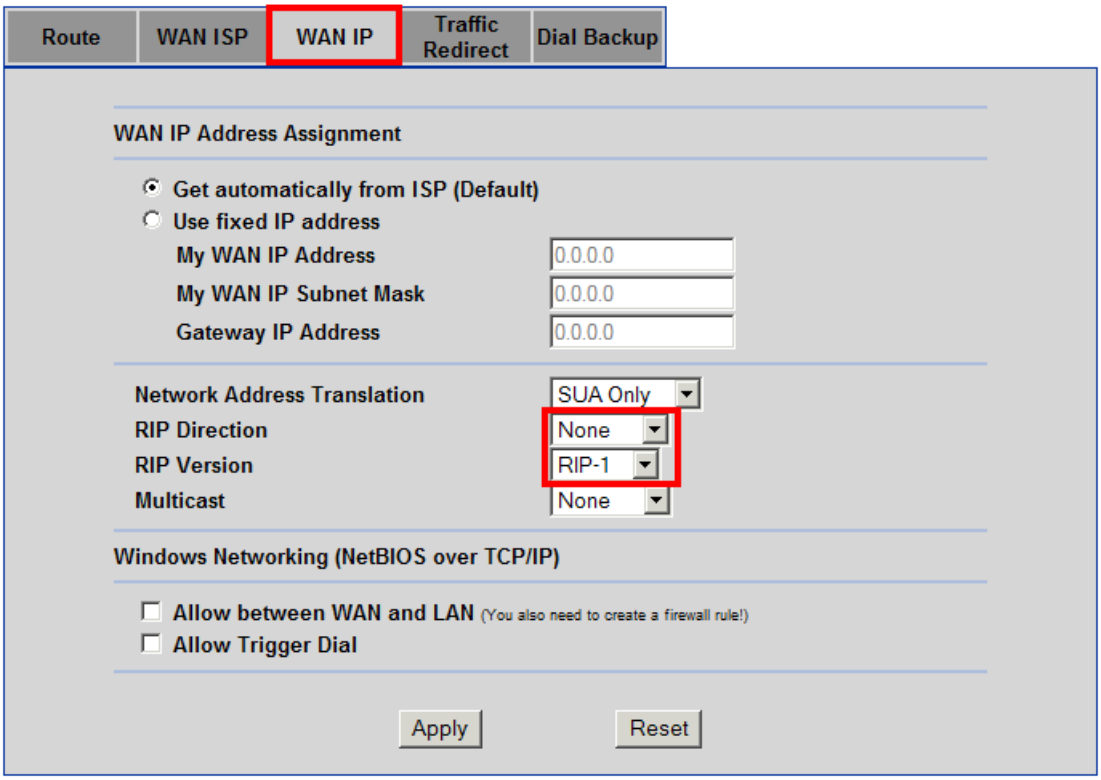


9. Select the **WAN IP** tab. Set the **RIP Direction** and **RIP Version** as required.

BCM50e/be WAN IP Screen



BCM50a/ba WAN IP Screen



10. Click **Apply** to save your settings.

RIP Settings

Attribute	Description
RIP Direction	RIP (Routing Information Protocol) allows a router to exchange routing information with other routers. The **RIP Direction** field controls the sending and receiving of RIP packets. Choose **Both**, **None**, **In Only** or **Out Only**. When set to **Both** or **Out Only**, the Integrated Router will broadcast its routing table periodically. When set to **Both** or **In Only**, the Integrated Router will incorporate RIP information that it receives. When set to **None**, the Integrated Router will not send any RIP packets and will ignore any RIP packets received. By default, **RIP Direction** is set to **Both**.
RIP Version	The RIP Version field controls the format and the broadcasting method of the RIP packets that the Integrated Router sends (it recognizes both formats when receiving). Choose **RIP-1**, **RIP-2B** or **RIP-2M**. **RIP-1** is universally supported; but **RIP-2** carries more information. **RIP-1** is probably adequate for most networks, unless you have an unusual network topology. Both **RIP-2B** and **RIP-2M** sends the routing data in **RIP-2** format; the difference being that **RIP-2B** uses subnet broadcasting while **RIP-2M** uses multicasting. Multicasting can reduce the load on non-router machines since they generally do not listen to the **RIP** multicast address and so will not receive the **RIP** packets. However, if one router uses multicasting, then all routers on your network must use multicasting, also. By default, the **RIP** Version field is set to **RIP-1**.

Static Route Configuration

Static Routes are configured by specifying a final destination IP address (essentially an end-point) and the gateway (router) it has to go through to get there.

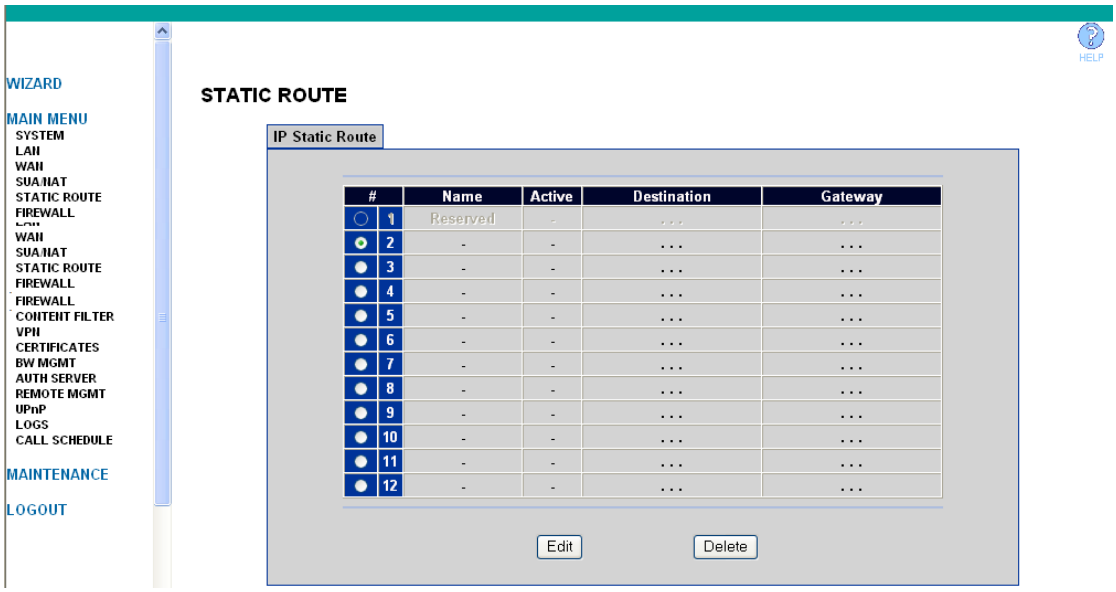
Again, Static Routes can be employed in smaller networks where routing paths do not change often, and also where endpoints are networks that do not connect to other networks.

Static Routes can also be used to inform the BCM50 Integrated Router of routes that it cannot learn via other means, i.e. RIP.

There are 12 Static Routes available.

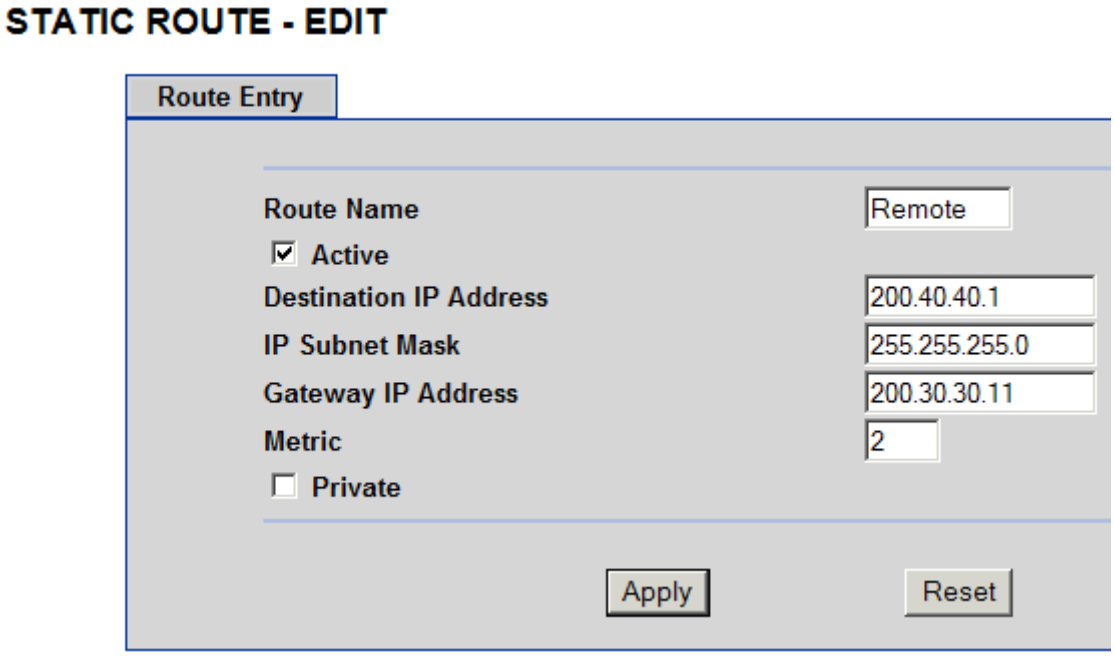
1. Access the Integrated Router web Router GUI.

2. From the Main Menu, select **Static Route**.



3. Select a route number and click **Edit**.

4. Enter the details as required.



5. Click **Apply** to save the route.

Static Route Settings

Attribute	Description
Route Name	Enter a descriptive name for this route. This is for identification purposes only. If this field is blank, the route will be deleted.
Active	Select this check box to activate this static route.
Destination IP Address	This parameter specifies the IP network address of the final destination. Routing is always based on network number. If you need to specify a route to a single host, use a subnet mask of 255.255.255.255 in the subnet mask field to force the network number to be identical to the host ID.
IP Subnet Mask	Type the IP subnet mask for this destination.
Gateway IP Address	Type the IP address of the gateway. The gateway is an immediate neighbour of your Integrated Router that will forward the packet to the destination. On the LAN, the gateway must be a router on the same segment as your Integrated Router; over the WAN, the gateway must be the IP address of one of the remote nodes.
Metric	Metric represents the "cost" of transmission for routing purposes. IP routing uses hop count as the measurement of cost, with a minimum of 1 for directly connected networks. Type a number that approximates the cost for this link. The number need not be precise, but it must be between 1 and 15. In practice, 2 or 3 is usually a good number.
Private	This parameter determines if the Integrated Router will include the route to this remote node in its RIP broadcasts. If this check box is selected, this route is kept private and not included in RIP broadcast. If it is not selected, the route to this remote node will be propagated to other hosts through RIP broadcasts.

Avaya Documentation Links

- BCM50e Integrated Router Configuration – Basics
- BCM50a Integrated Router Configuration – Basics