BCM Rls 6.0

DHCP

Task Based Guide

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DHCP Server

Overview

The BCM can provide DHCP (Dynamic Host Configuration Protocol) service to network clients. DHCP allows a network administrator to supervise and distribute IP addresses - and other network settings such as default gateways and DNS servers - from a central location. This service dynamically assigns IP addresses to network computers and/or IP telephones, so you do not need to manually assign an IP address. It can also automatically assign a new IP address if a device connects to a different place in the network.

The BCM can also issue Terminal Proxy Server (S1 & S2) settings to IP Telephones (e.g. i200x, 1100, 1200 series) which register using DHCP. This ensures that the IP phones register correctly with the BCM.

Note: BCM50 models: This guide describes the DHCP service on the standard BCM50. The settings detailed in this guide do not relate to DHCP on the BCM50e router. For information on the BCM50e DHCP settings, refer to the **BCM50 Router LAN Settings Guide**.

DHCP and the BCM

The BCM has various DHCP modes. It can issue DHCP information to:

- All devices on a network
- IP Phones only
- Or not be used as any type of DHCP server

As well as acting as a DHCP server, the BCM can be a DHCP client, i.e. it can request DHCP information from an established DHCP server on the network.

DHCP Modes

By default the BCM DHCP service is set to **Enabled – IP Phones Only**. Ensure that the mode is set correctly for the network.

The available modes are:

- Disabled – Does not respond to DHCP requests from any device.
- Enabled – IP Phones only – Only responds to DHCP requests from IP Phones.
- Enabled – All Devices – Responds to DHCP requests from PC's and IP Phones on the network.

Note: If DHCP is not required on the network, it is recommended that the DHCP mode is set to **Disabled**.

Note: If there is an existing DHCP Server on the network, it is recommended that the BCM be given a static or reserved IP Address . See the network administrator to obtain a static IP Address. Refer to the **BCM LAN IP Address** section for information on setting the BCM IP Address.

Address Range

The Address Range is a specified range of addresses that the BCM will issue when requested by network DHCP clients. Careful planning is required here so as not to conflict with static or reserved addresses. Address Ranges should be manually configured on the BCM, i.e. there is no automatic configuration of Address Ranges.

Reserved Addresses

Addresses can be reserved for specific network devices. The purpose of this is to ensure that a particular network device always has the same IP address. The advantage of reserving an address over statically assigning an address on the network device itself is that the network device can still register with the DHCP server and obtain all the usual DHCP information such as default gateway, DNS Servers etc.

IP Addresses are reserved for a network device by entering the MAC address of the device and the IP Address reserved. A Reserved Address entry in the DHCP settings screen would require the following example information:

- MAC address, e.g. 00-04-23-0C-78-C8
- Reserved IP Address, e.g. 30.30.30.5

Note: The MAC (physical) address can be viewed from the command prompt by entering *ipconfig /all* command

IP Terminals Details

The DHCP configurations screens contain information to be transferred to IP phones when they register via DHCP. The IP phone-specific information includes the S1 and S2 server address, which is the IP address that the phone has to register with to use IP Telephony features. The S1 and S2 address will most usually be the IP Address of the BCM LAN ports.

Other information that can be returned to DHCP requests from IP phones includes VLAN information.

DHCP & VLANs

A VLAN is a Virtual LAN whereby connected devices appear to be on the same physical network, although they may be geographically separated. This configuration is dependant on a network device being capable of supporting VLAN's, and all VLAN information should be obtained from the network administrator who looks after the VLAN devices.

The BCM is capable of creating up to 4 VLANs on the BCM50, and 8 VLANs on the BCM450. This helps with network management, as it may not be desirable to have IP Phones and PCs on the same logical network.

Configuring VLANs on the BCM itself affects DHCP in two main areas:

- Published IP Address: Creating VLANs results in a choice of selection for the Published IP Address (i.e. either the Customer LAN, or one of the VLANs). The Published IP Address should be the S1 Address in the IP Terminal DHCP Options screen.
- Address Ranges: If VLANs are configured on the BCM, DHCP Address Ranges can be configured to suit the VLAN network range. For example, if a VLAN interface is configured with an address of 200.40.40.5, the BCM will allow an Address Range of 200.40.40.160 – 200.40.40.180 to be created.

Note: For more information about the Published IP Address, refer to the ***IP Telephony Guide***. For more information about VLANs, refer to the ***VLANs Guide***.

BCM50e Integrated Router

On the BCM50e models, it is possible to choose between using the DHCP service on the main BCM unit, or the DHCP service on the router. There is an option with the DHCP General Settings tab on BCM50e models to select which DHCP Service to use. It is recommended that if VLANs are configured on the BCM, the main BCM unit DHCP service is used, and the router DHCP service is disabled.

For more information on the BCM50e router DHCP service, please refer to the ***Router – LAN Settings Guide***.

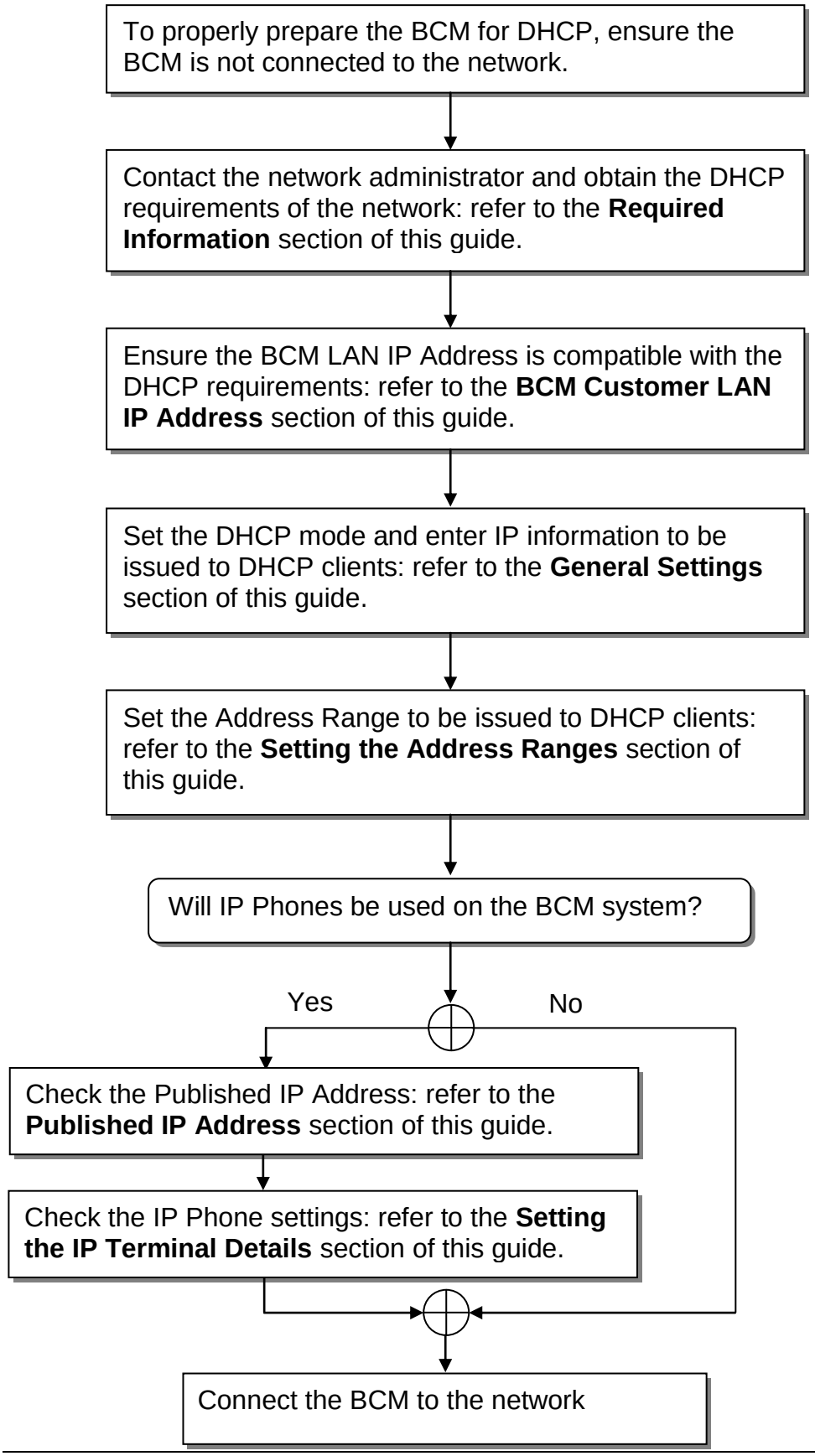
Required Information

Before commencing installation, certain information is required concerning the BCM and the customer's network. For configurations as a DHCP Server:

- Has the LAN interface IP Address been set as required?
- Does the customer already have a DHCP server?
- What is the required range of IP addresses?
- Is there a requirement for Reserved IP addresses?
- Does the customer have a WINS server and if so, what is the IP address?
- Is the customer using IP Phones?
- Is the customer using VLAN's?

Flow Chart

Use the flow chart below to determine which sections of the guide to use.



Configuration

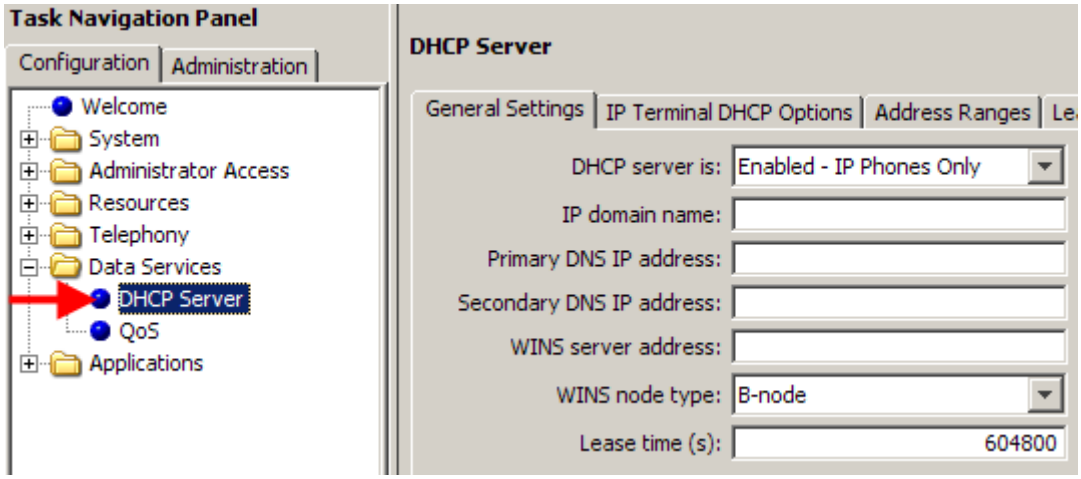
Note: Before configuring the BCM DHCP settings, ensure the LAN settings are configured as required, e.g. manual IP Address or obtain automatically. Refer to the **BCM LAN IP Address** section of this guide for more information on configuring the LAN IP Address.

General Settings

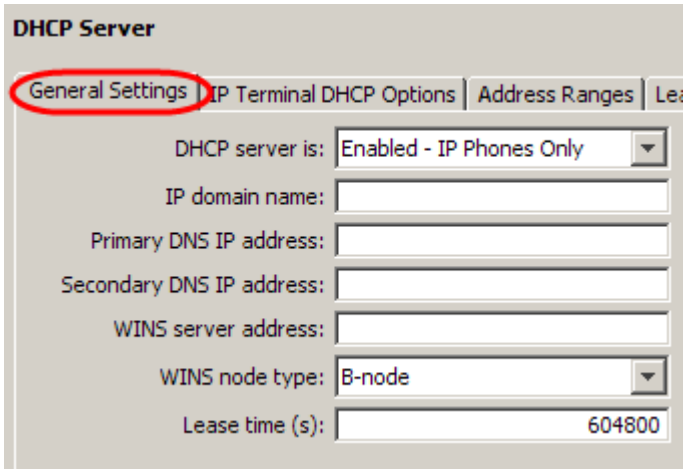
The General Settings screen allows you to configure the DHCP mode (refer to the **DHCP Modes** section of this guide) and DNS/WINS servers and Default Gateway that the network uses, if known.

The settings entered here are returned to DHCP clients if DHCP is enabled. If there is already a DHCP server on the network and the BCM is set to obtain its IP Address dynamically (refer to the **BCM LAN IP Address** section of this guide), the BCM will obtain DNS, and WINS information from the network DHCP Server.

1. In Element Manager, select the **Configuration** tab and open the **Data Services** folder and select **DHCP Server**.



2. Ensure the **General Settings** tab is selected. Set the DHCP Mode and other details such as DNS & WINS Server addresses.



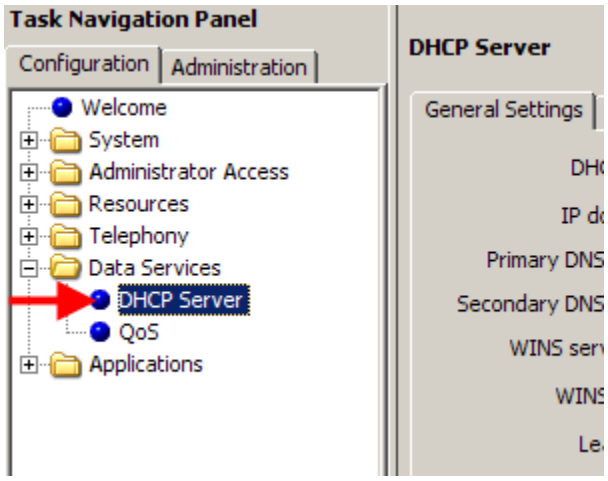
General Settings Screen Settings

Attribute	Value	Description
The DHCP Server is	Disabled Enabled - IP Phones Only Enabled - All Devices	Determines the functionality of the DHCP server. Default: Disabled
IP domain name	<alphanumeric character string>	The domain name of the network.
Primary DNS IP address	<IP Address, format 10.10.10.10>	The IP address of the primary DNS to be used by DHCP clients.
Secondary DNS IP address	<IP Address, format 10.10.10.10>	The IP address of the secondary DNS to be used by DHCP clients.
WINS server address	<IP Address, format 10.10.10.10>	The address of the Windows Internet Server, which resolves IP addresses on a DHCP network.
WINS node type	<drop-down menu>	The type of WINS node: • B-node: The BCM first checks the HMHOSTS cache, then uses broadcast for name registration and resolution. • P-node:The BCM registers with a NetBIOS Name server at startup. • M-node: Mixes B- and P-node. The BCM uses the B-node method, and if that fails, uses the P-node method. • H-node: Uses both B- and P-node methods. B-node is used only as a last resort. Default: H-node
Lease time(s)	<numeric string>	The amount of time before a DHCP lease expires and the device must request a new IP address. Default: 604800 seconds

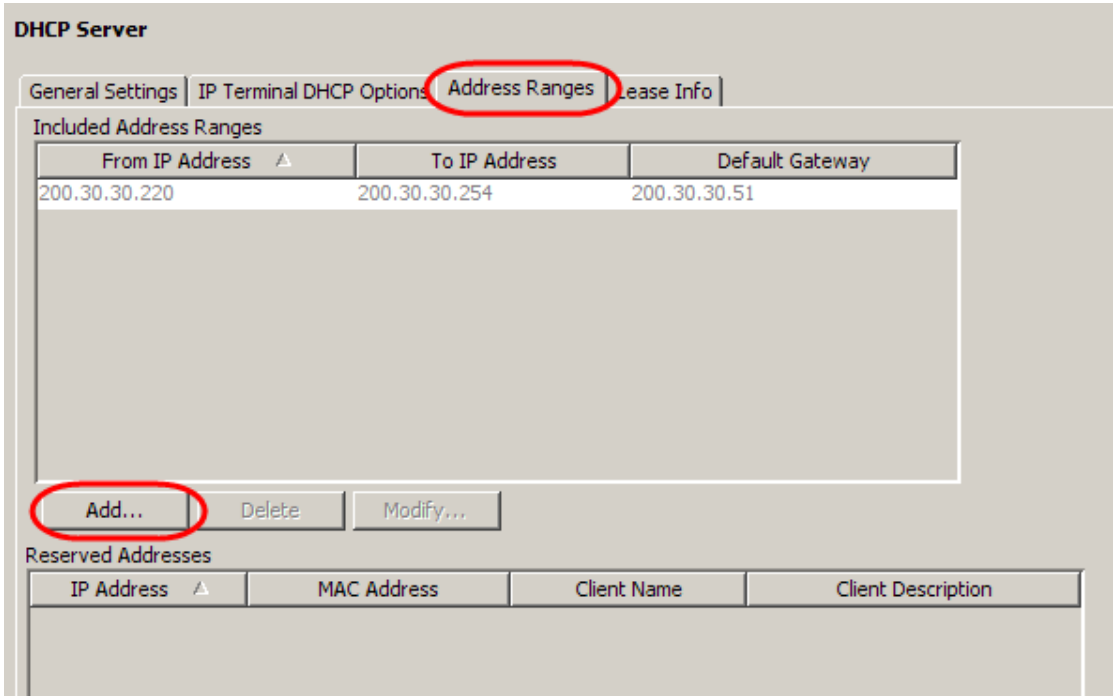
Setting the Address Ranges

The IP Addresses to be issued to DHCP clients are entered in this section. If the DHCP mode is set to **Enabled – IP Phones Only** then the Address Range entered here will only relate to IP Phones.

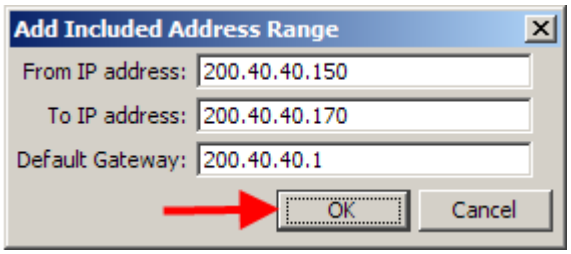
1. In Element Manager, select the **Configuration** tab and open the **Data Services** folder and select **DHCP Server**.



2. Select the **Address Ranges** tab. Click on Add to add a new Address Range. It is possible to configure Address ranges for the Customer LAN IP address and also any VLANs that may be configured (refer to the **Additional Information** section of this guide for more information on the Customer LAN and VLANs). You can also:
   - Click on **Modify** to add a new address range
   - Click on **Delete** to delete a range



3. In this example an address range has been added. Enter the address range and the Default Gateway to be issued to DHCP clients and click **OK**.



Note: If an Address Range is entered that is not compatible with the Customer LAN or VLAN subnets, an **Invalid Parameter** error message will be displayed. The Address Ranges must be compatible with the Customer or VLAN subnets.

Note: Whenever you make changes to the address range, the DHCP server may become unavailable to clients for a brief period of time.

Address Ranges Settings

Attribute	Value	Description
Included Address Ranges		
From IP Address	<IP Address, format 10.10.10.10>	An IP address specifying the lowest IP address in a range.
To IP Address	<IP Address, format 10.10.10.10>	An IP address specifying the highest IP address in a range.
Default gateway	<IP Address, format 10.10.10.10>	The gateway through which DHCP clients connect to an external network.
Add	<button>	Click to add an included address range.
Delete	<button>	Click to delete a selected address range.
Modify	<button>	Click to modify a selected address range.

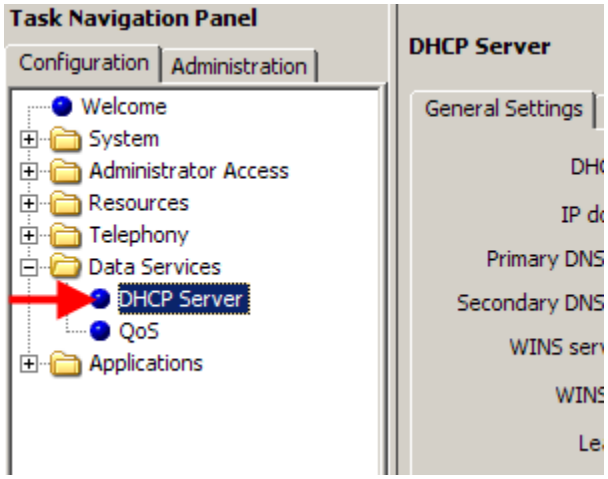
Reserving Addresses

Reserving Addresses for network devices ensures that those devices always retain the same IP Address, but they can also be updated with DNS and gateway information, should that change. Typically, network devices that provide some kind of function to the rest of the network, e.g. hosting an application service, would benefit from having a reserved address. With this configuration, other network devices can always connect to the same “location”.

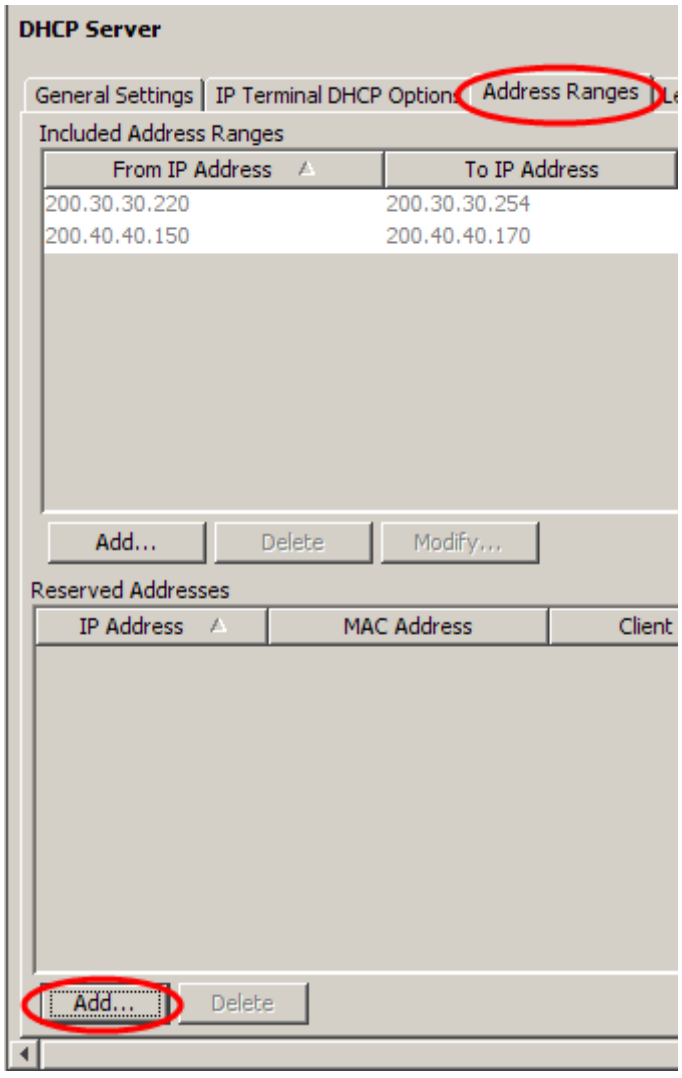
The process of reserving an IP Address consists of specifying the MAC address of the network device, and assigning an IP Address to the MAC Address.

Note: Reserved Addresses cannot be within an existing BCM DHCP Address Range.

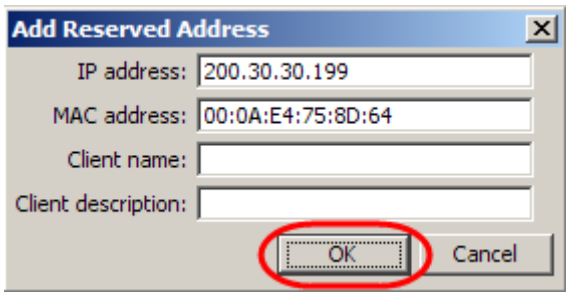
1. In Element Manager, select the **Configuration** tab and open the **Data Services** folder and select **DHCP Server**.



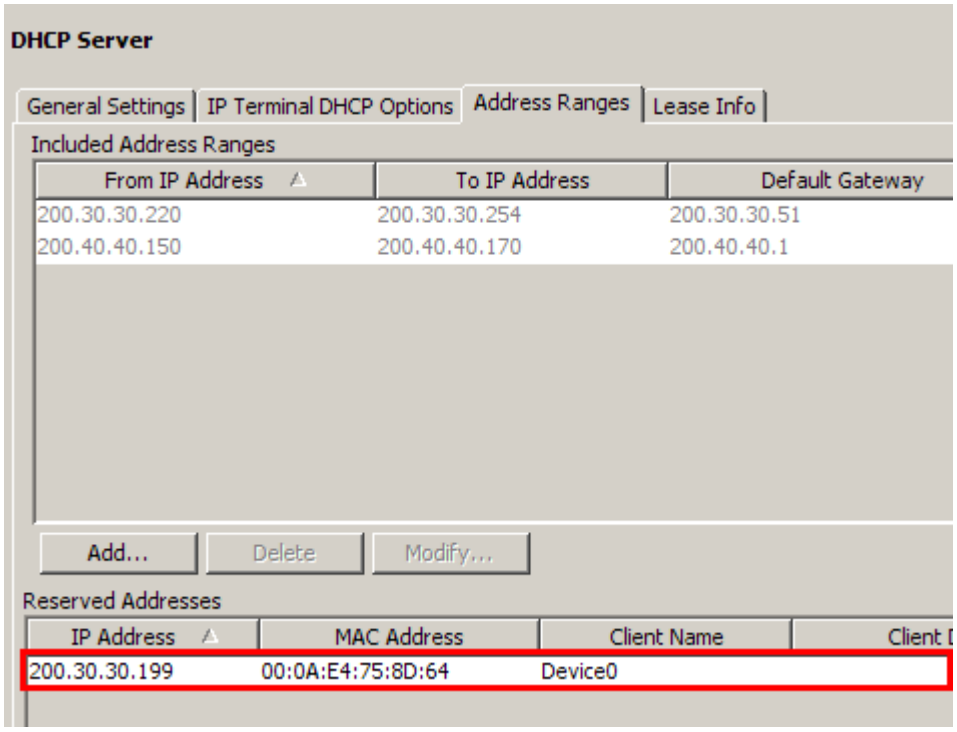
2. Click on the **Address Ranges** tab. In the bottom part of the screen, click on **Add**.



3. Enter the **IP Address** you want to reserve, and the **MAC Address** to assign the IP Address to. The **Client Name** and **Client Description** fields are optional, but helpful in identifying the device.



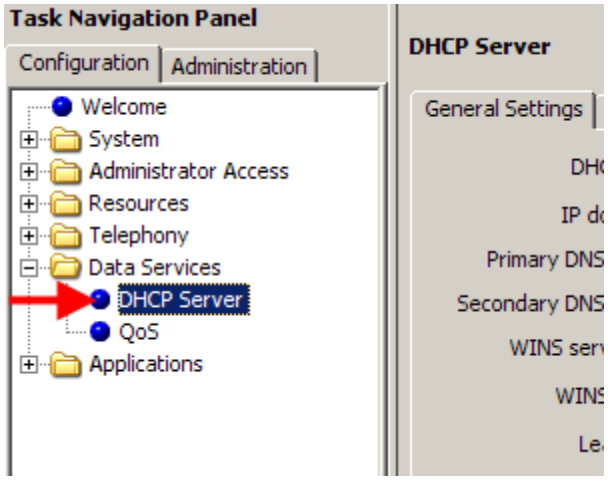
4. Click on **OK** when finished. The entry will be displayed in the **Reserved Address** table.



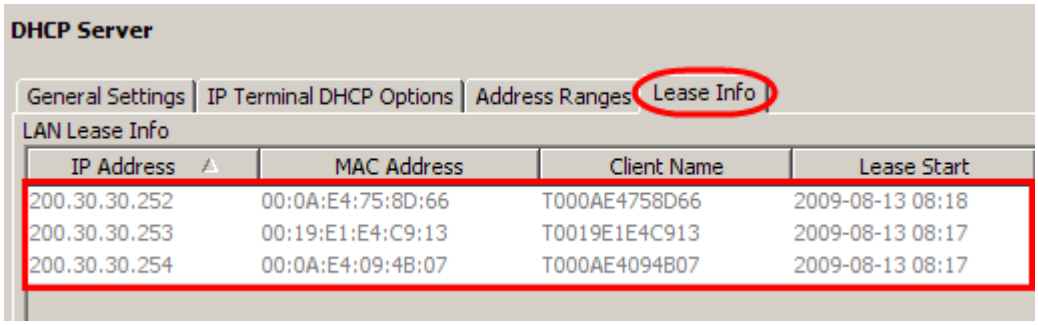
Viewing Current DHCP Clients

Use the following procedure to view DHCP clients who currently have an IP Address issued by the BCM.

1. In Element Manager, select the **Configuration** tab and open the **Data Services** folder and select **DHCP Server**.



2. Click on the **Lease Info** tab. Current DHCP clients will be listed.



Lease Info Settings

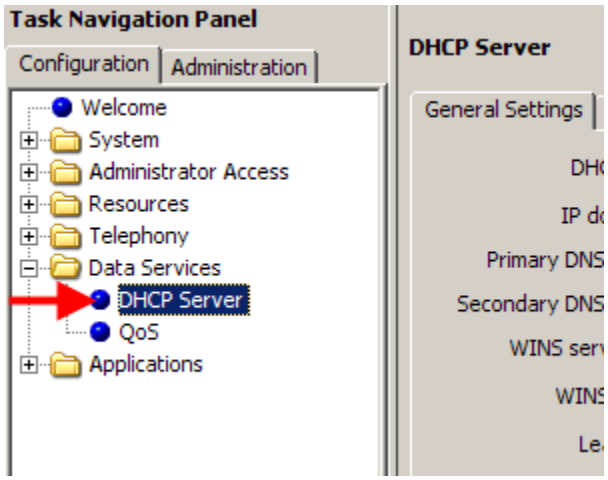
Attribute	Value	Description
IP Address	<read-only>	The IP address currently supplied to the client.
MAC Address	<read-only>	The MAC address of the client.
Client Name	<read-only>	The client name, if the client has been given a name in the Reserved Addresses table. Otherwise, this field is blank.
Lease Start	<read-only date format: yyyy-mm-dd hh:mm:ss>	The date and time the lease began.
Lease Expiration	<read-only date format: yyyy-mm-dd hh:mm:ss>	The date and time the lease is set to expire.

Setting the IP Terminal Details

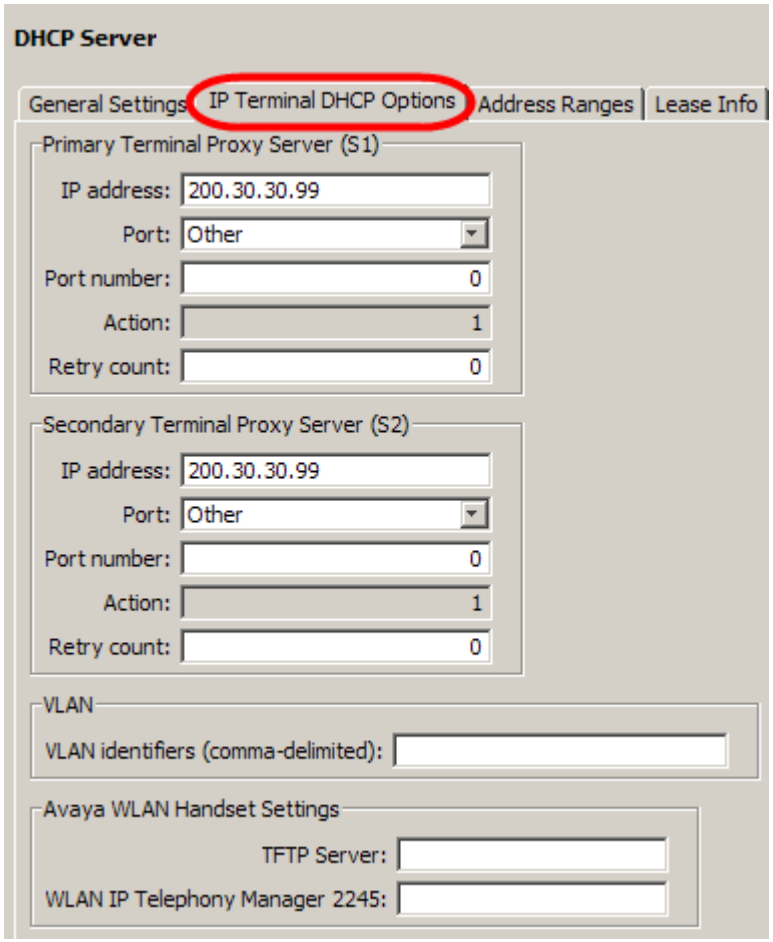
Use this screen to enter information that will be issued to IP Phones when they register via DHCP. This mainly relates to the S1 & S2 servers which are the IP Addresses of the UNISTIM service that provide the IP Telephony service. The UNISTIM service is provided via the BCM LAN ports, and VLANs.

Note: If the S1 and S2 entries are not manually changed, they will always default to the Published IP Address (refer to the **Additional Information** section of this guide). If the Published IP Address changes, so will the S1 & S2 addresses. If the S1 and S2 addresses are entered manually, they will not automatically update when the Published IP Address is changed.

1. In Element Manager, select the **Configuration** tab and open the **Data Services** folder and select **DHCP Server**.



2. Select the **IP Terminal DHCP Options** tab. If you need to change the S1 or S2 information, alter the appropriate fields.



Note: The S1 address should always correspond to the BCM LAN IP Address. The S2 address can be the same as S1 or the IP Address of a BCM offering a backup UNISTIM service.

3. If there are any VLAN (Virtual LAN) settings to be issued to IP Phones, enter these in the **VLAN Identifiers** field. This information will be supplied by the VLAN switch administrator.

IP Terminal DHCP Options

Attribute	Value	Description
Primary Terminal Proxy Server (S1)		
IP Address	<IP address> 10.10.10.10	The IP address of the Proxy Server for IP phones.
Port	<drop-down list>	Select the appropriate port: BCM SRG Meridian 1/Succession 1000 Centrex/SL-100 Other
Port number	<read only>	The port number on the terminal through which IP phones connect.
Action	<read-only>	The initial action code for the IP telephone.
Retry count	<number>	The delay before an IP phone retries connecting to the proxy

Attribute	Value	Description
		server.
Secondary Terminal Proxy Server (S2)		
IP address	<IP address> 10.10.10.10	The IP address of the Proxy Server for IP phones.
Port	<drop-down list>	Select the appropriate port: BCM SRG Meridian 1/Succession 1000 Centrex/SL-100 Other
Port number	<read onlyr>	The port number on the terminal through which IP phones connect.
Action	<read-only>	The initial action code for the IP telephone
Retry count	<number>	The delay before an IP phone retries connecting to the proxy server.
VLAN		
VLAN identifiers (comma-delimited)		Specify the Virtual LAN (VLAN) ID numbers that are given to the IP telephones. If you want DHCP to automatically assign VLAN IDs to the IP telephones, enter the VLAN IDs in the following format: VLAN-A:id1, id3,…,idn. Where: VLAN-A – is an identifier that tells the IP telephone that this message is a VLAN discovery message. Id1, id2,…idn – are the VLAN ID numbers that DHCP can assign to the IP telephones. You can have up to 10 VLAN ID numbers listed. The VLAN ID numbers must be a number from 0 to 4095. For example, if you wanted to use VLAN IDs 1100, 1200, 1300 and 1400, you would enter the following string in this box: VLAN-A:1100, 1200, 1300, 1400. If you do not want DHCP to automatically assign VLAN IDs to the telephones, enter VLAN-A:none, in this text box. Note1: The AVAYA IP Terminal VLAN ID string, must be terminated with a period (.). Note2: If you do not know the VLAN ID, contact your network administrator. Note3: For information bout how to setup a VLAN, refer to the user documentation that came with your VLAN compatible switch, or refer to the ***VLANs Guide***.
Avaya WLAN Handset Settings		
TFTP Server	IP Address	Enter the IP Address of the TFTP server that is used for providing firmware to the WLAN handsets and the 2245 IP Telephony Manager
WLAN IP Telephony Manager 2245	IP Address	Enter the IP Address WLAN IP Telephony Manager 2245

Additional Information

BCM Customer LAN IP Address

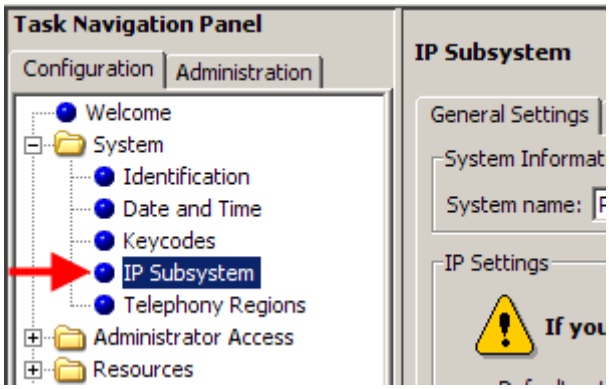
The Customer LAN IP Address of the BCM can be statically defined or obtained automatically.

If the BCM LAN IP Address is statically defined and BCM DHCP is enabled, the Address Ranges (refer to the **Setting the Address Ranges** section of this guide) must be in the same network range as the BCM IP Address.

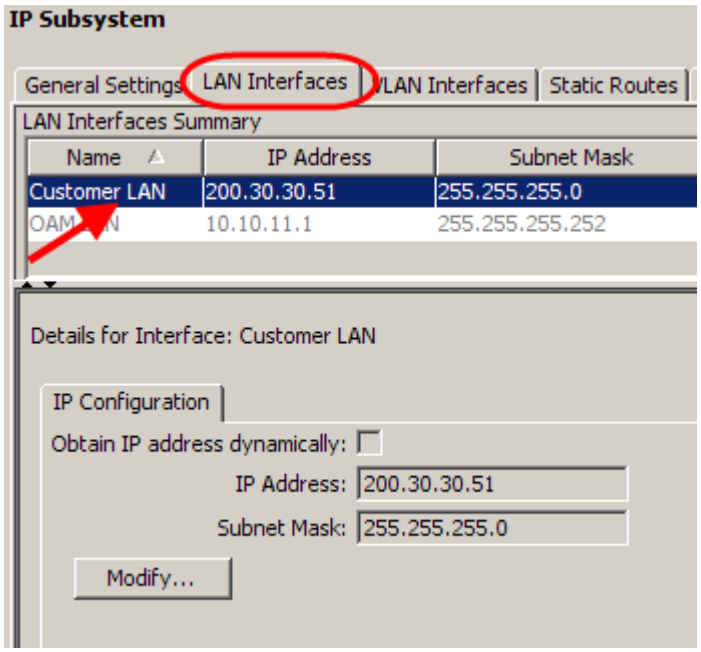
If there is an existing DHCP Server on the network, it is recommended that the BCM be given a static IP Address. See the network administrator to obtain a static IP Address.

Use the following procedure to set the BCM Customer LAN IP Address.

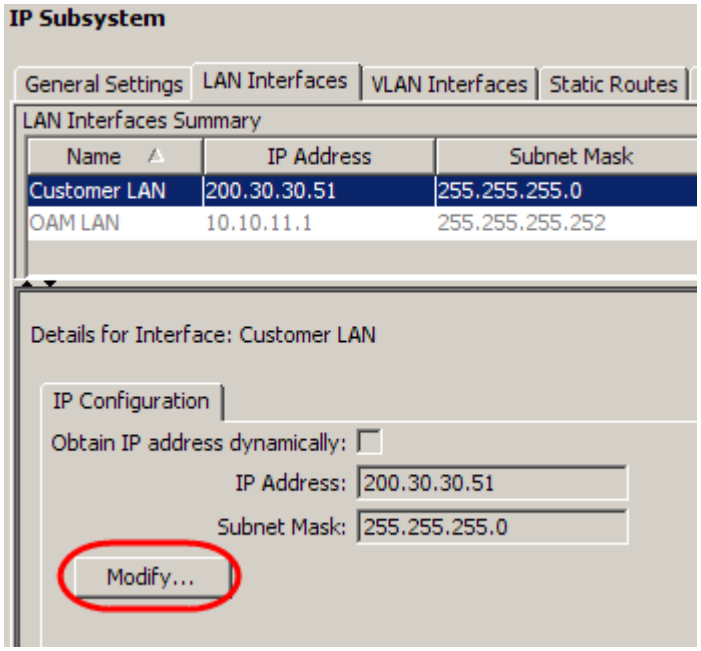
1. In the **Configuration** tab open the **System** heading and click on **IP Subsystem**.



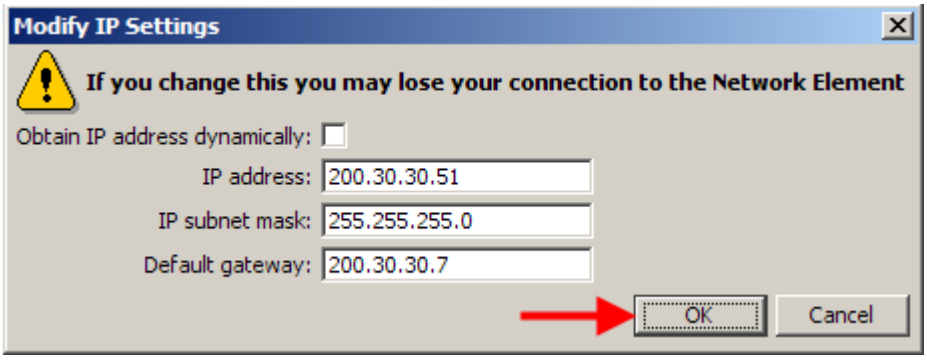
2. Click on the **LAN Interfaces** tab, and select **Customer LAN**.



3. If the Customer LAN IP Address requires changing, click on the **Modify** button in the Details area.



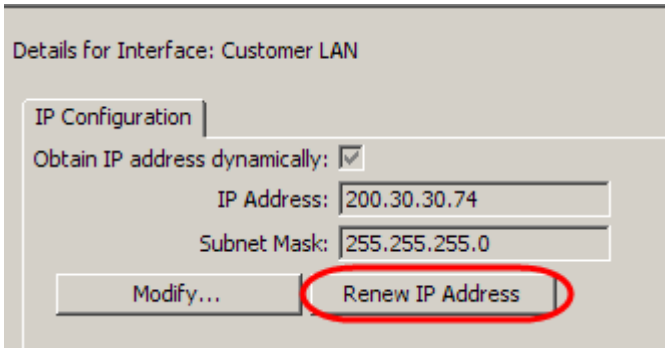
4. Enter the IP Settings as required. You can choose to:
    - Obtain an IP Address, Subnet Mask, and Default Gateway automatically.
    - Enter an IP Address, Subnet Mask, and Default Gateway manually.



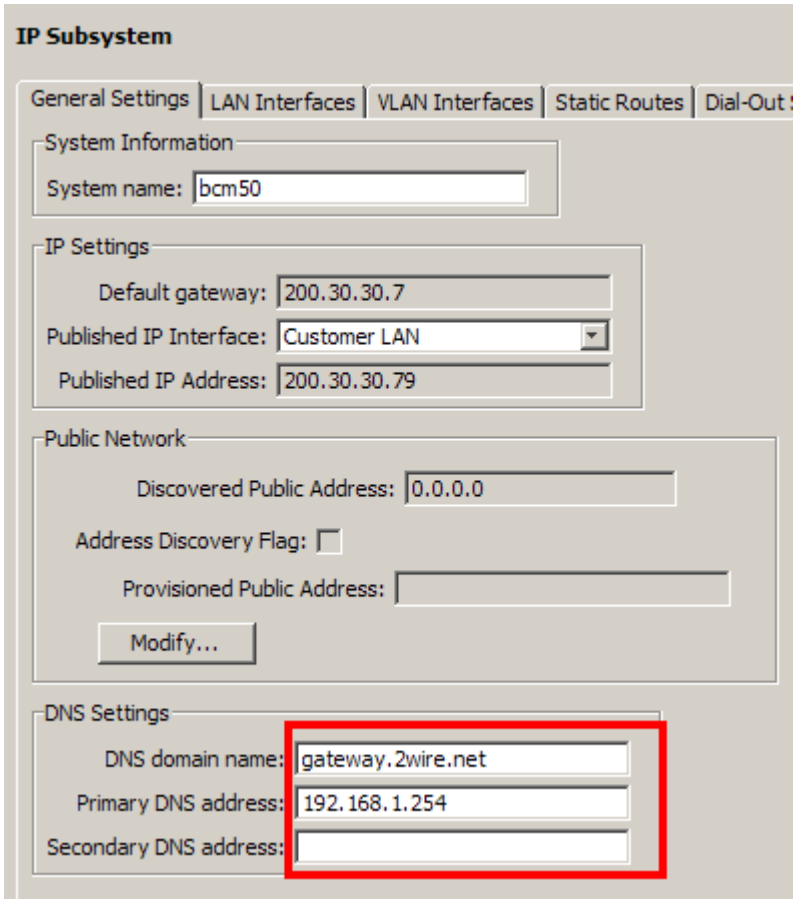
5. Click **OK** to save your settings. You may lose your connection to Element Manager. You will not need to reboot the BCM.

Note: The BCM's Default Gateway can also be set in the General Settings tab.

6. If the BCM is obtaining its network settings via DHCP (either its own DHCP server or one that resides on the network), you can choose to renew the network settings. To do so, click **Renew IP Address**.



7. DNS settings can also be entered, if you are not receiving this information via DHCP. Contact the network administrator for DNS settings. Click on the **General Settings** tab and enter the required DNS information.



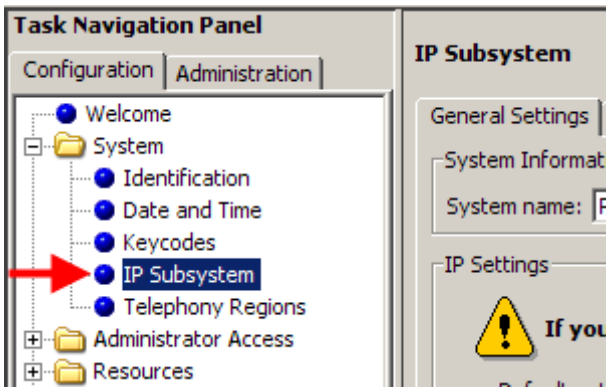
Note: For more information concerning the configuration of VLANs, please refer to the ***VLANs Guide***.

Published IP Address

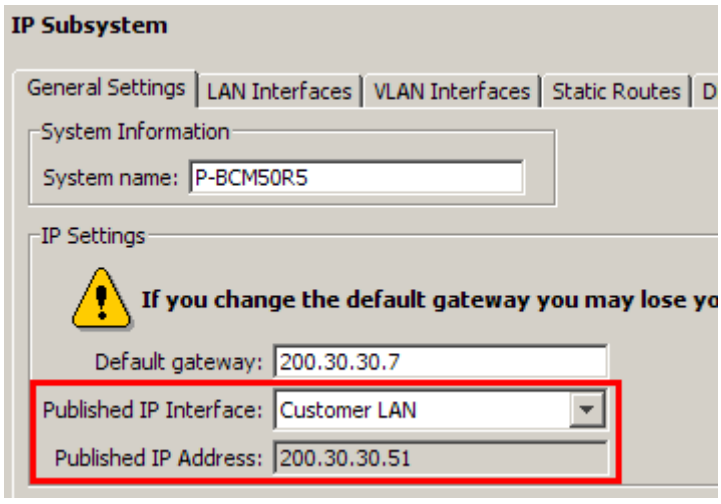
The Published IP Address is the address that IP Telephones should register against, being the S1 and S2 (dependent on network setup) addresses configured during the registration process. This affects DHCP configuration in respect to the S1/S2 addresses entered in the IP Terminal DHCP Options screen, which generally should be the same as the Published IP Address.

Use the following process to check the Published IP Address and the S1/S2 addresses.

1. In the Element Manager Configuration tab, open the **System** folder and click on **IP Subsystem**.

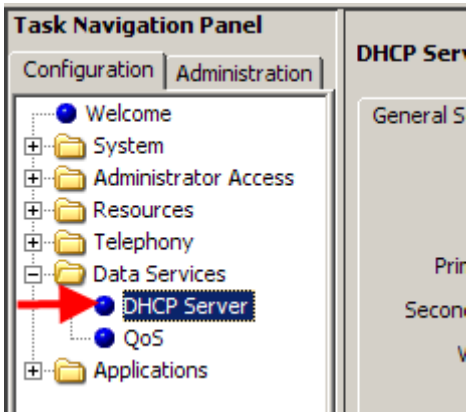


2. The **Published IP Interface** will be listed as either the main Customer LAN or a VLAN created in the VLAN Interfaces tab.

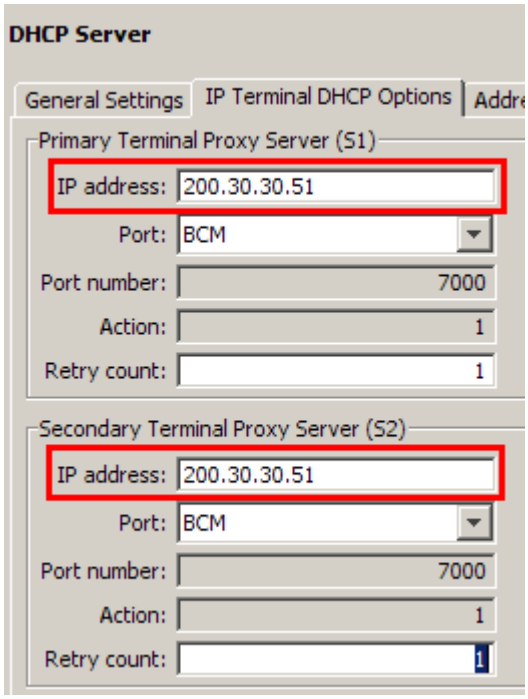


3. The actual IP Address of the selected Published IP Interface will be stated in the **Published IP Address** field.

4. Now open the **Data Services** folder and select **DHCP Server**.



5. Click on the **IP Terminal DHCP Options** screen and check that the S1 & S2 IP Addresses match the **Published IP Address**.



Note: Certain network scenarios may require the S1 & S2 Addresses to be different, i.e. there may be a secondary server for the IP phone to connect to in case of the primary server not being available.

For further information about the Published IP Interface, refer to the ***IP Telephony Guide***.

Avaya Documentation Links

- Planning and Engineering guide
- Installation Checklist and Quick Start guide
- Configuration – System guide