technicolor

FEEL THE WONDER

CGA4131 BUSINESS GATEWAY

OPERATIONS GUIDE

Version – 0.2

technicolor

FEEL THE WONDER

Revision History

Revision	Date	Description
0.1	3/2/2018	Initial draft
0.2	3/6/2018	Updated the baseline configuration file; added details for spectrum analyzer and MTA based on review comments.

technicolor

FEEL THE WONDER

Table of Contents

technicolor

FEEL THE WONDER

1 Introduction

This document provides information on the Technicolor CGA4131 Business Gateway to Technicolor's service provider customers. The audience for this document includes those personnel who are tasked with deploying, maintaining, and servicing this device as well as those who provide answers to questions from end users.

1.1 Technicolor CGA4131 Business Gateway

The CGA4131 Business Gateway allows cable MSOs to respond to small and medium businesses with a business-centric set of data, voice, and wireless features. The CGA4131 is a DOCSIS® 3.1 broadband gateway offering triple-play services: up to Gigabit speeds, business VoIP and next generation 802.11ac Wi-Fi. The device can be configured using a web page user interface accessible by the user or remotely by the MSO by SNMP/TR-069.

The Technicolor CGA4131 offers the following features:

- Compliance with DOCSIS 3.0 and 3.1 standards to deliver high-end performance and reliability
- High performance Broadband Internet Connectivity
- Eight-line embedded digital voice adapter for wired telephony service
- Two 802.11 Wi-Fi radios for dual-band concurrent operation, with up to eight SSIDs per radio
- Wi-Fi Protected Setup™ (WPS) support with hardware push button for simplified and secure wireless setup
- User configurable Access Control and firewall settings
- Compact design allows for horizontal or wall-mounted operation
- Color coded interface ports and corresponding cables to simplify installation and setup
- Front panel LEDs show operational status for the user
- Automatic software upgrade capability for the service provider
- TR-069 Compliant Remote Management Capabilities

technicolor

FEEL THE WONDER

Front Panel View and LED Operations

The following images represent the front panel view of the CGA4131 TCH2-GA-TBR.

Figure 1.1

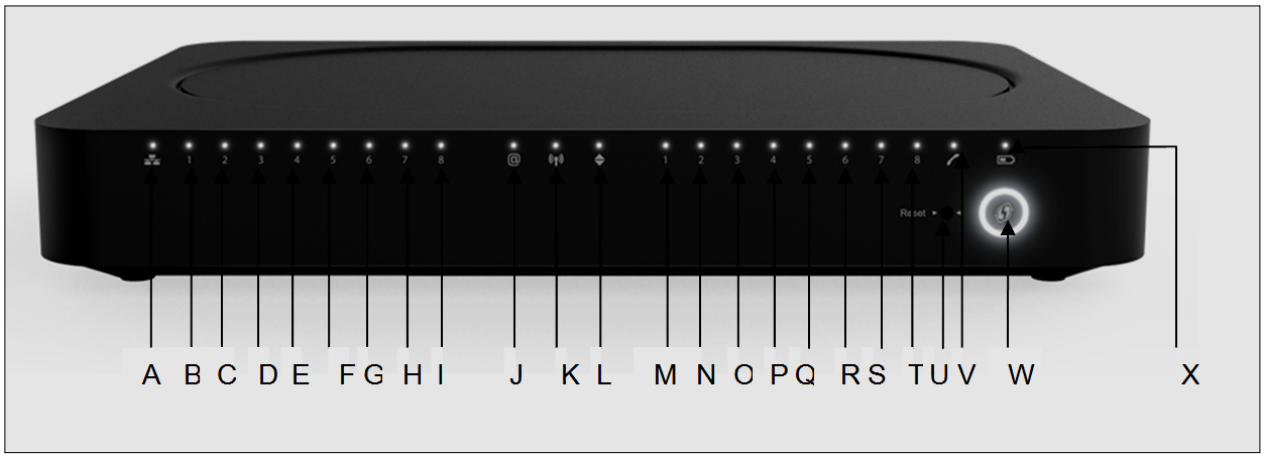


Figure 1.2

Ethernet LED (Item A)

State	Description
Solid on	Ethernet is enabled with AC power
Off	Ethernet is not enabled

technicolor

FEEL THE WONDER

Ethernet Ports 1-8LEDs (Items B - I)

The CGA4131 has 8 Ethernet ports. The status of each port is shown by its LED state:

Port 1	LED B	Port 2	LED C	Port 3	LED D	Port 4	LED E
Port 5	LED F	Port 6	LED G	Port 7	LED H	Port 8	LED I

State	Description
Solid on	The port is connected.
Off	The port is not connected
Blinking	Data is being transferred

Internet LED (Item J)

State	Description
Solid on	Internet Service is active
Off	There is no Internet Service

Wi-Fi LED (Item K)

State	Description
Blinking	Data (2.4GHz or 5GHz) is active over the wireless connection
Off	Wi-Fi access point is not enabled

Online LED (Item L)

State	Description
Solid on	Connected to the service provider's network. Even when internet is not active, LED is on. Data traffic can be used.
Blinking	Trying to acquire Upstream, Downstream frequencies

technicolor

FEEL THE WONDER

Telephone Lines 1-8 LEDs (Items M - T)

The CGA4131 has 8 telephone lines. The status of each telephone lines shown by its LED state:

Telephone Line 1	LED M	Telephone Line 2	LED N	Telephone Line 3	LED O	Telephone Line4	LED P
Telephone Line5	LED Q	Telephone Line6	LED R	Telephone Line7	LED S	Telephone Line8	LED T

State	Description
Solid on	Telephone line is registered successfully with the call manager
Blinking	Telephone line has either gone off-hook or is in active call
Off	Telephone line is not registered with the call manager

Reset Button (Item U)

Press the Reset button to reset the box.

Press the Reset button approximately 12-13 seconds to restore to factory settings.

Telephone Line LED (Item V)

State	Description
Solid on	MTA Voice interface is operational
Off	MTA Voice interface is not operational

WPS (Item W)

State	Description
Blinking	WPS Process initialized and lasts for 2 minutes
Off	No WPS activity

Battery LED (Item X)

State	Description
Off	Device is off, or AC power is on or Battery is not installed
Solid on	On Battery Power
Blinking	Battery needs replacement

Top View

The following image depicts the top view of the CGA4131 TCH2-GA-TBR.

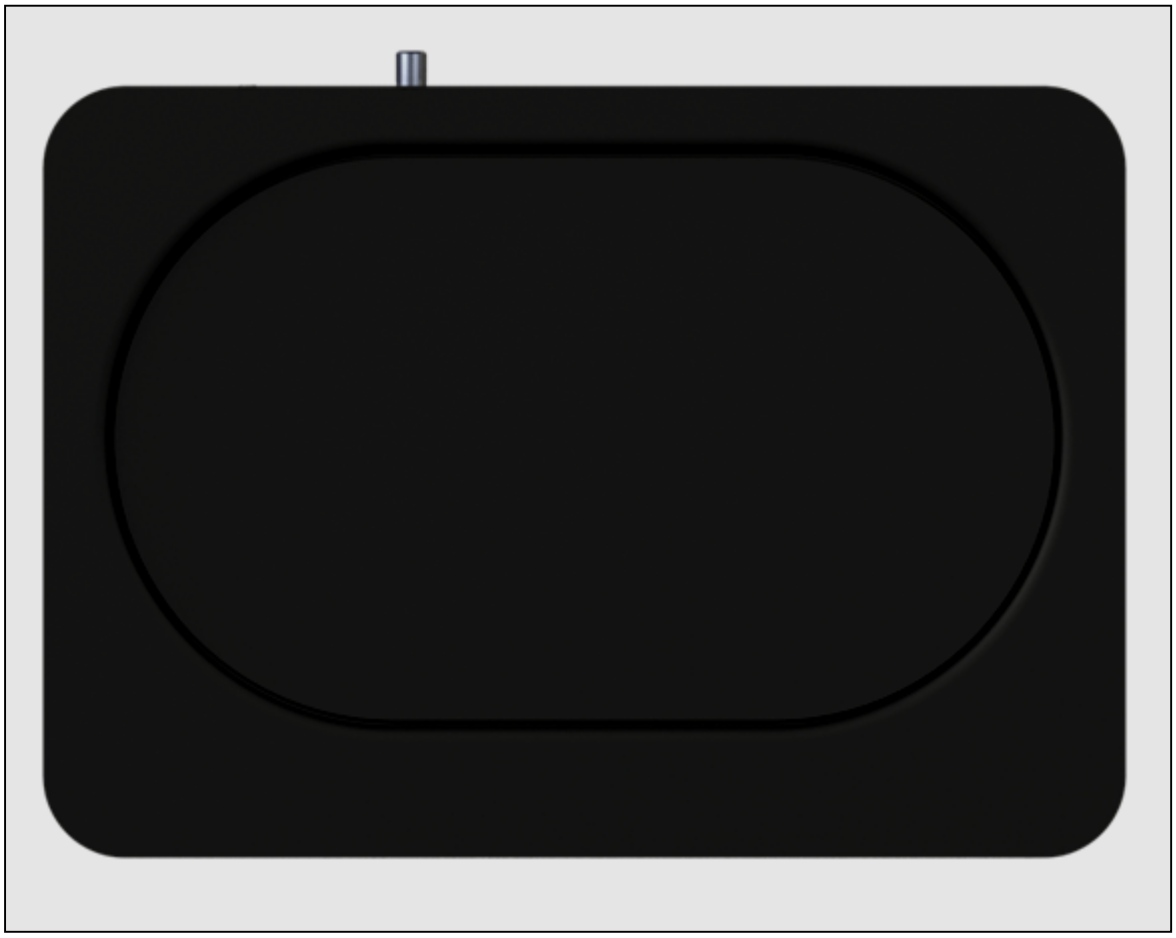


Figure 1.3

Back Panel

The following image depicts the back panel view of the CGA4131 TCH2-GA-TBR.

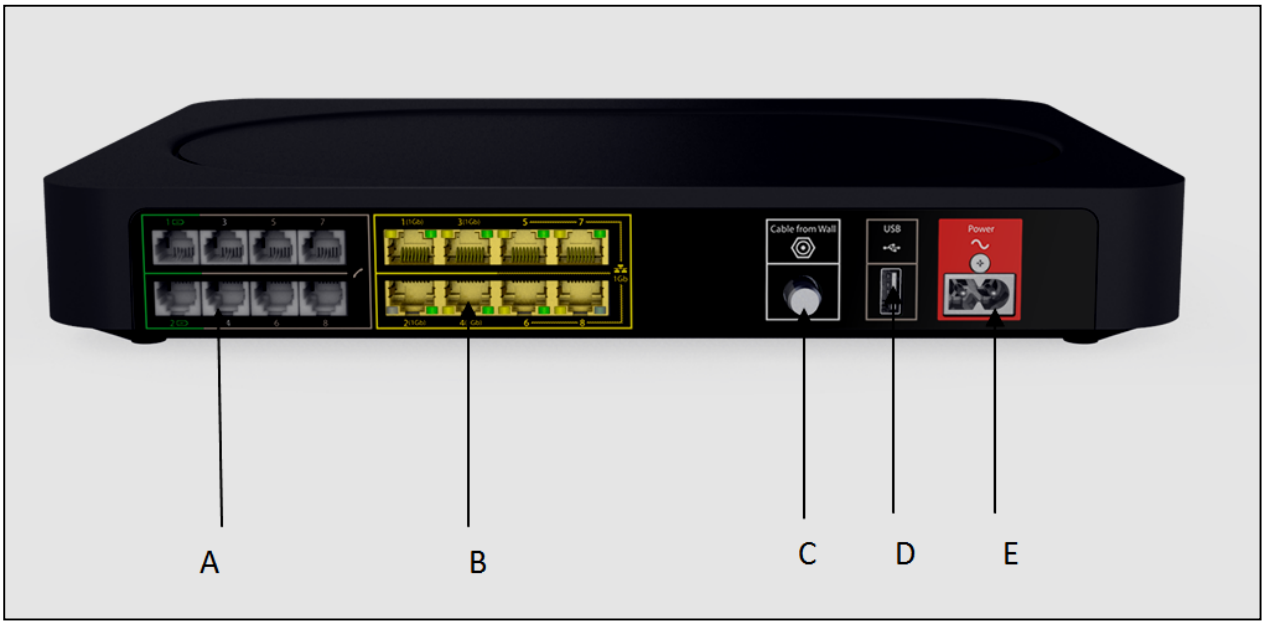


Figure 1.4

Telephone port (Item A)

Eight-line embedded digital voice adapter for wired telephony service.

Ethernet switch (Item B)

Eight 1000/100/10BASE-T Ethernet ports provide wired connectivity. The first 4 Ethernet ports each can transfer up to 1 Gbps data, while the ports 5 to 8 can have a combined data transfer speed of 1 Gbps. Each Ethernet port has two LEDs:

LED	LED Status	Description
Left LED (Green)	Solid on	Connected to a Gigabit Ethernet device
	Blinking	Connected to a Gigabit Ethernet device and sending/receiving data
	Off	Not connected to a Gigabit Ethernet device
Right LED (Amber)	Solid on	Connected to a100Mbps/10Mbps device
	Blinking	Connected to a 100Mbps/10Mbps device and sending/receiving data
	Off	Not connected to a 100Mbps/10Mbps device

Cable port (Item C)

The CGA4131 complies with DOCSIS 3.0, 3.1 standards along with Packet Cable™ specifications to deliver high-end performance and reliability.

USB port (Item D)

USB port is used to connect USB devices.

Power inlet (Item E)

The power inlet (Power) allows connecting the power cord.

Bottom panel

The following images depict the bottom panel view of the CGA4131 TCH2-GA-TBR.

Figure 1.5 shows Bottom panel with Battery Compartment with door on (Item A).

Battery Slot (Item A)

Accommodates devices' backup battery (optional)

Figure 1.5

Figure 1.6 shows Bottom panel with labeling.

Figure 1.6

2.4GHz SSID (Item A)
Network Name (SSID) is the network name of the 2.4GHz access point. SSID is derived from the Wi-Fi MAC address.

Passphrase of Device for2.4GHz (Item B)
PRE-SHARED KEY-Passphrase of Device for 2.4GHz.

5GHz SSID (Item C)
Network Name (SSID) is the network name of the 5GHz access point. SSID is derived from the Wi-Fi MAC address.

Passphrase of Device for5GHz (Item D)
PRE-SHARED KEY - Passphrase of Device for 5GHz

HW Rev (Item E)
This specifies the hardware revision of the device.

Factory ID (Item F)
This defines the factory ID of the device.

MTA MAC address (Item G)
This defines the MTA MAC address.

WAN MAC address (Item H)
This defines the WAN MAC address.

CM MAC address (Item I)
This defines the Cable Modem's MAC address.

Serial Number of Device (Item J)
This defines the device's serial number.

technicolor

FEEL THE WONDER

2 WebUI Access Overview

This section explains the various access interfaces and access levels to CGA4131 Web UI.

There are 3 interfaces for the user/operator to connect to on the CGA4131 TCH2-GA-TBR:

- LAN (Default URL 192.168.0.1 on LAN side)
- Cable Modem (CM IP on the WAN side)
- eRouter (eRouter IP on the WAN side)

Apart from these 3 interfaces, there are 2 user levels – Home User and Advanced User.

The access to the various Web UI pages from various interfaces are determined by the configuration of specific MIBs and the bit masking MIB to enable or disable a specific Web UI page. The following table explains the Web UI pages accessible in these combinations:

MIB	MIB value	Interface	Web UI pages accessible
tchCmWebAccessUserIfLevel.home-user.lan	0	192.168.0.1 on LAN PC	Allow Home user to login, show only System Page
	1	192.168.0.1 on LAN PC	Allow Home user to login, show only System Page
	2	192.168.0.1 on LAN PC	Allow Home user to login, show only System Page
	3	192.168.0.1 on LAN PC	Allow Home user to login, show only System Page
	100	192.168.0.1 on LAN PC	Allow Home user to login, show all pages with bitmasking (tchCmWebAccessHomeWriteBitmask)
tchCmWebAccessUserIfLevel.home-user.rf-cm	-	Home User not permitted to login with CM IP on WAN PC	Home User is not permitted to login with CM IP on WAN PC
tchCmWebAccessUserIfLevel.home-user.wan-rg	0	eRouter IP on WAN PC	Allow Home user to login, show only System Page
	1	eRouter IP on WAN PC	Allow Home user to login, show only System Page
	2	eRouter IP on WAN PC	Allow Home user to login, show only System Page
	3	eRouter IP on WAN PC	Allow Home user to login, show only System Page
	100	eRouter IP on WAN PC	Allow Home user to login, show all pages with bitmasking (tchCmWebAccessHomeWriteBitmask)
tchCmWebAccessUserIfLevel.adv-user.lan	0	192.168.0.1 on LAN PC	Advanced user is not permitted to login from LAN side
	1	192.168.0.1 on LAN PC	Advanced user is not permitted to login from LAN side
	2	192.168.0.1 on LAN PC	Advanced user is not permitted to login from LAN side
	3	192.168.0.1 on LAN PC	Advanced user is not permitted to login from LAN side

	100	192.168.0.1 on LAN PC	Advanced user is not permitted to login from LAN side
tchCmWebAccessUserIfLevel.adv-user.rf-cm	0	CM IP on WAN PC	Allow Advanced user to login, show only System Page
	1	CM IP on WAN PC	Allow Advanced user to login, show only System Page
	2	CM IP on WAN PC	Allow Advanced user to login, show only System Page
	3	CM IP on WAN PC	Allow Advanced user to login, show only System Page
	100	CM IP on WAN PC	Allow Advanced user to login, show all pages with bit masking (tchCmWebAccessAdvancedWriteBitmask)
tchCmWebAccessUserIfLevel.adv-user.wan-rg	0	eRouter IP on WAN PC	Allow Advanced user to login, show only System Page
	1	eRouter IP on WAN PC	Allow Advanced user to login, show only System Page
	2	eRouter IP on WAN PC	Allow Advanced user to login, show only System Page
	3	eRouter IP on WAN PC	Allow Advanced user to login, show only System Page
	100	eRouter IP on WAN PC	Allow Advanced user to login, show all pages with bitmasking (tchCmWebAccessAdvancedWriteBitmask)

The Web UI pages available for home user and the advanced user access levels can be different. They are defined by the access Level MIB and bit masking MIBs (tchCmWebAccessHomeWriteBitmaskand tchCmWebAccessAdvancedWriteBitmask).The bit masking information is also stored in the config file. They can also be modified by the SNMP MIBs. Please see Appendix 2 for examples of configuring these bitmask MIB elements.

The user is directed to login page to login with default system credentials (admin / password). For the advanced user, the user name is admin and the password would be the generated password of the day (POTD).

CM Config file snippet for POTD configuration

```
SnmpMibObject tchCmWebAccessAdvancedType.0 Integer 2; /* potd */
SnmpMibObject tchCmWebAccessAdvancedPassword.0 HexString 0x272a73bdb4945eddc88f6a66198c1056;
```

The Web UI has an idle timeout of 15 minutes. The user needs to re-login to access the Web UI after the timeout.

3 Initial Configuration and Setup

The CGA4131 is configured using the Web UI.

3.1 Accessing the Web UI

CGA4131 Web UI can be accessed through the various interfaces (LAN IP, CM IP or the eRouter IP) as explained in the previous section. The gateway prompts the user to enter the username and password.

Figure 3.1

The various pages on the Web UI would be accessible once the credentials are accepted.

technicolor

FEEL THE WONDER

4 Web UI Guide

The following table describes the web pages available to the users. Availability of these pages is defined by the Web UI access levels configured as per the previous section.

Top Tab	Sub-tab
Status	Overview
	Gateway
	Local Network
	Wireless
	DOCSIS Status
	DOCSIS Signal
	DOCSIS Log
	Spectrum Analyzer (WAN:- CM Side details for login work)
	System
Connection	Devices
	LAN
	WAN
	Routing
	Modem
	MTA
	Network Time
Wireless	Radio
	Security
	Advanced
	Guest Network
	MAC Control
	WPS
	QoS
	Hotspot
Security	Firewall
	IP Filter
	Device Filter

	Access Control
	Service Filter
	VPN
	Email Settings
	Report
Application	Port Forward
	Port Trigger
	Port Filter
	DDNS
	DMZ
	UPnP
	IP Passthrough
	SIP ALG
Administration	User
	Remote Access
	Backup & Restore
	Reboot & Reset
	Troubleshooting
	Remote Log
Diagnostic	System
	Interface
	Network
	Wireless
	Clients
	Internet

5 Status Pages

5.1 Overview

Status Tab / Overview
The Overview page under the Status page provides the high level view of the Business Gateway. It displays the connections on the Wi-Fi, LAN and Guest Wi-Fi networks.

- **Main Wi-Fi** Displays the connected Wi-Fi (WLAN) Clients with their Host Name and IP address.
- **Network** Displays the connected Wired (LAN) Clients with their Host Name and IP address.
- **Guest Wi-Fi** Displays the clients connected to Guest Wi-Fi.

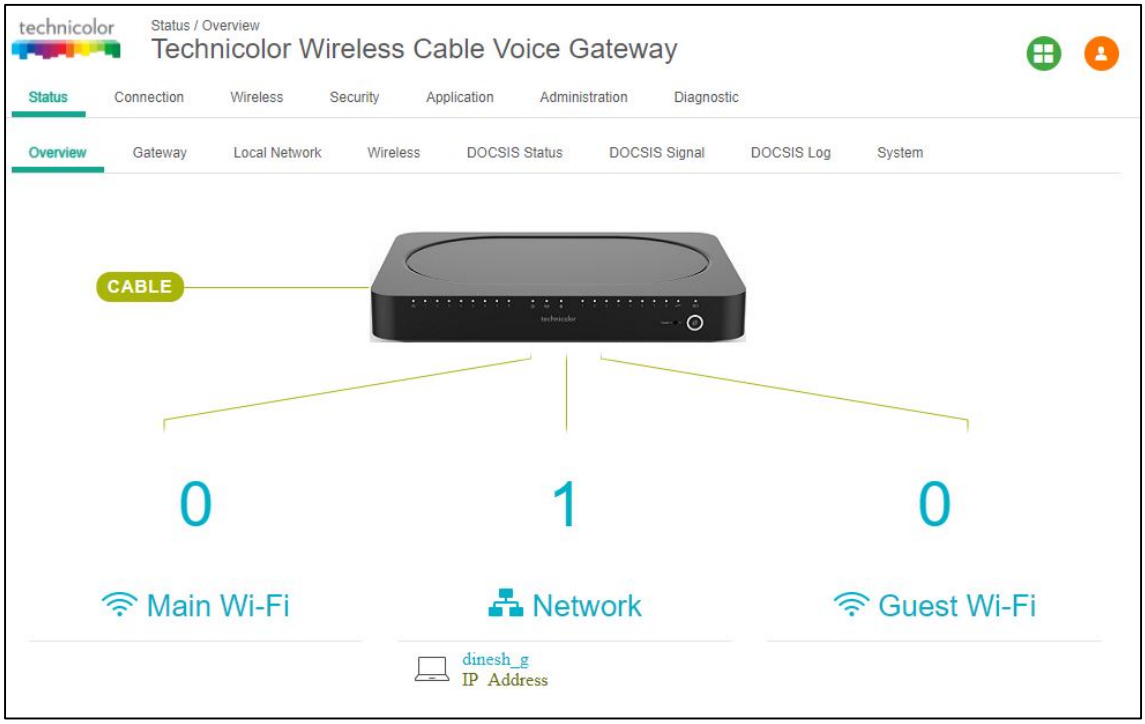


Figure 5.1

5.2 Gateway

Status Tab / Gateway
Click on the Status tab then click on Gateway. The page displays Gateway information and the IP Network information.

The Gateway Information section shows the Software Version, Vendor Name, eRouter MAC address, Device Mode, Router Provision Mode and Local Time set in the device as shown below:

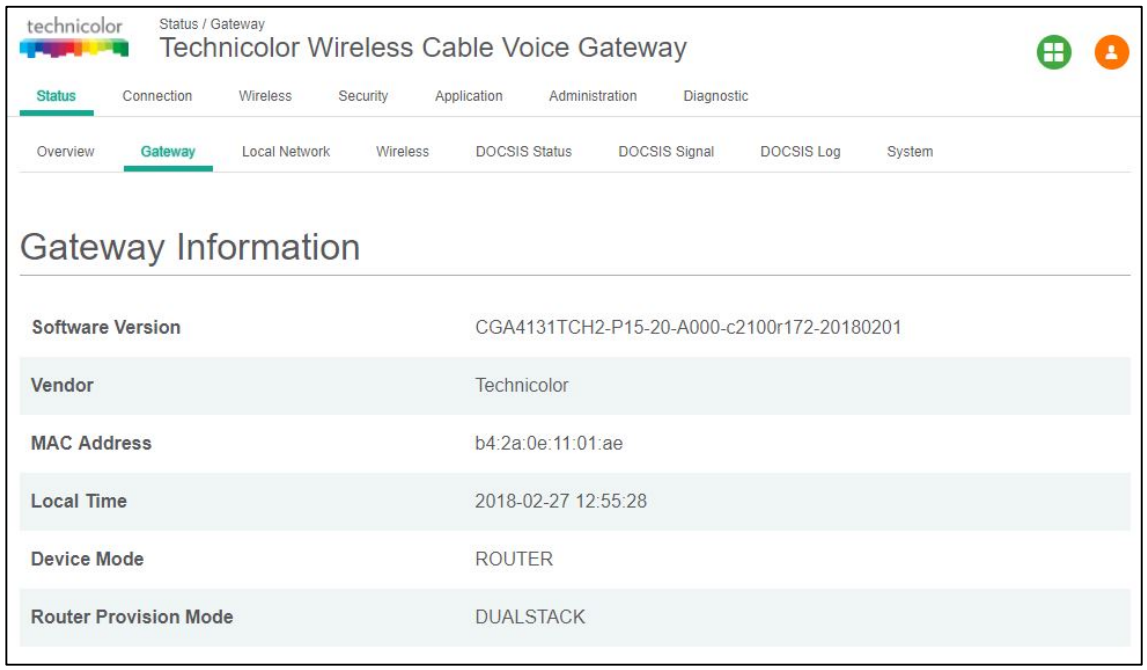


Figure 5.2

The IP connectivity information provided in the page includes eRouterIP Address, Subnet Mask, DNS and default Gateway Information for the IPv4 and IPv6 connections. The details are displayed as given below:

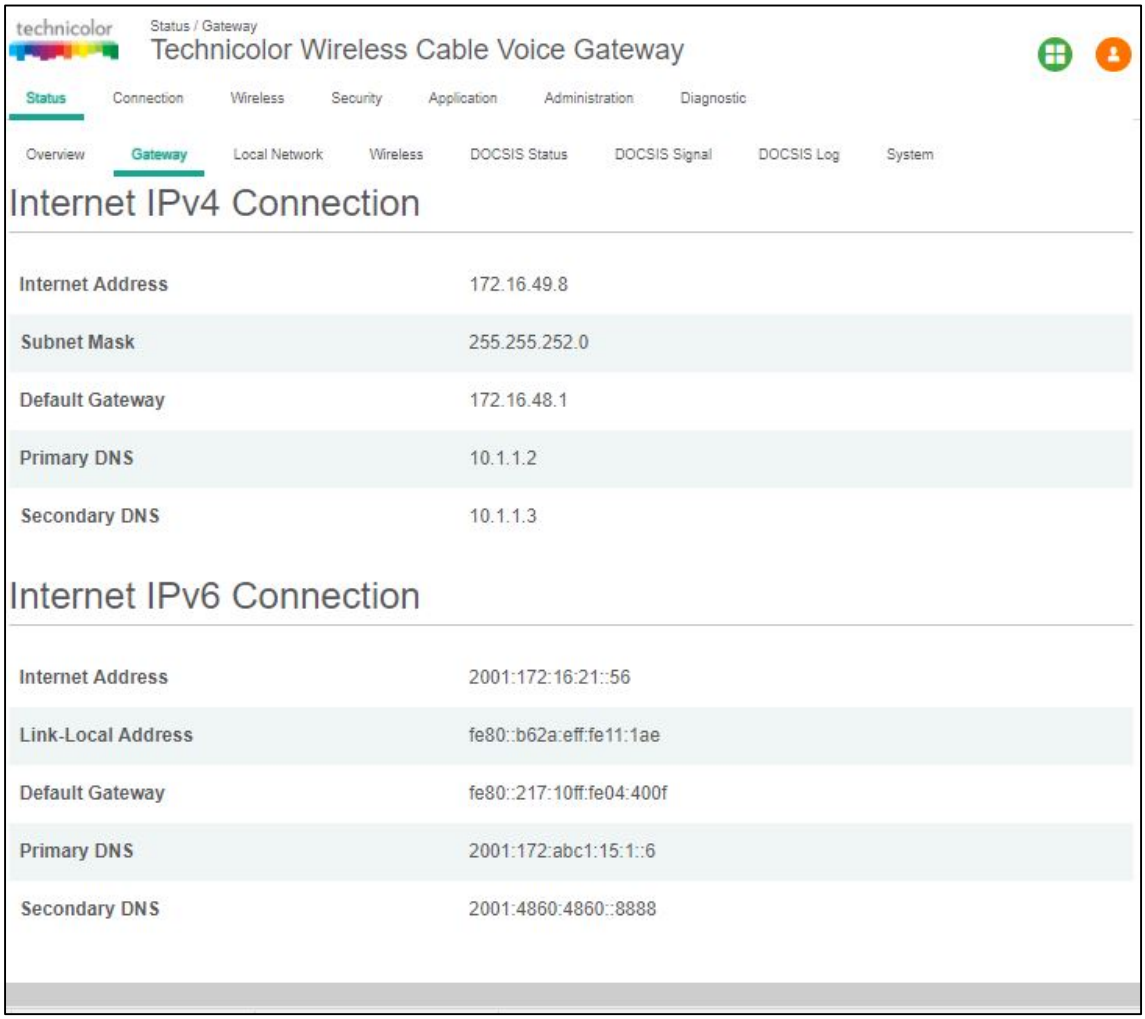


Figure 5.3

5.3 Local Network

Status Tab / Local Network

Click on the Status tab then click on Local Network. The Local Network page will display the LAN information seen by the user.

LAN Information:

This section displays the configuration of DHCP addresses for the home user on the LAN side, Information such as the Gateway Address, Subnet Mask, MAC Address, DHCP Server, DHCP Beginning Address and DHCP Ending Address are displayed here.

DHCP Clients:
The connected clients to the gateway via either Ethernet or Wi-Fi will be displayed in this table.

ARP Table:
The ARP Table section displays ARP information about connected clients. When a client is configured for static IP, the static option will be shown as Yes.

SLAAC Table Information:
Stateless Auto Configuration (SLAAC) is a feature offered by the IPv6 protocol. It allows the various devices attached to an IPv6 network to connect to the Internet using the Stateless Auto Configuration without requiring any intermediate IP support in the form of a DHCP server. The SLAAC Table section displays details about IPv6 Address, the corresponding MAC Address and Reachability States information.

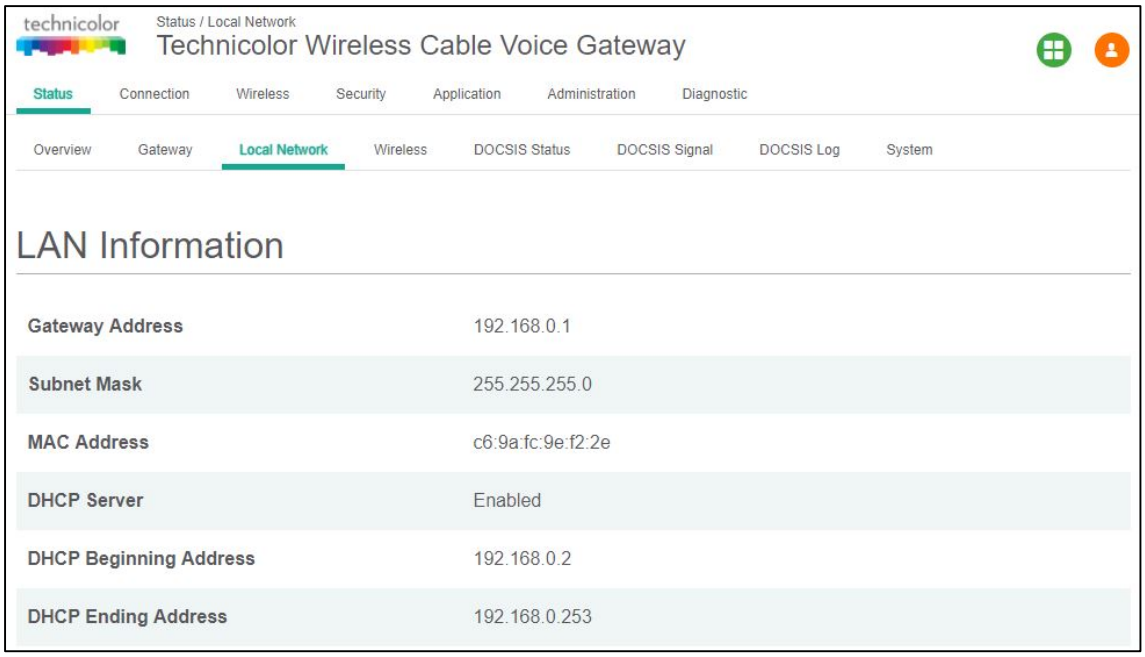


Figure 5.4

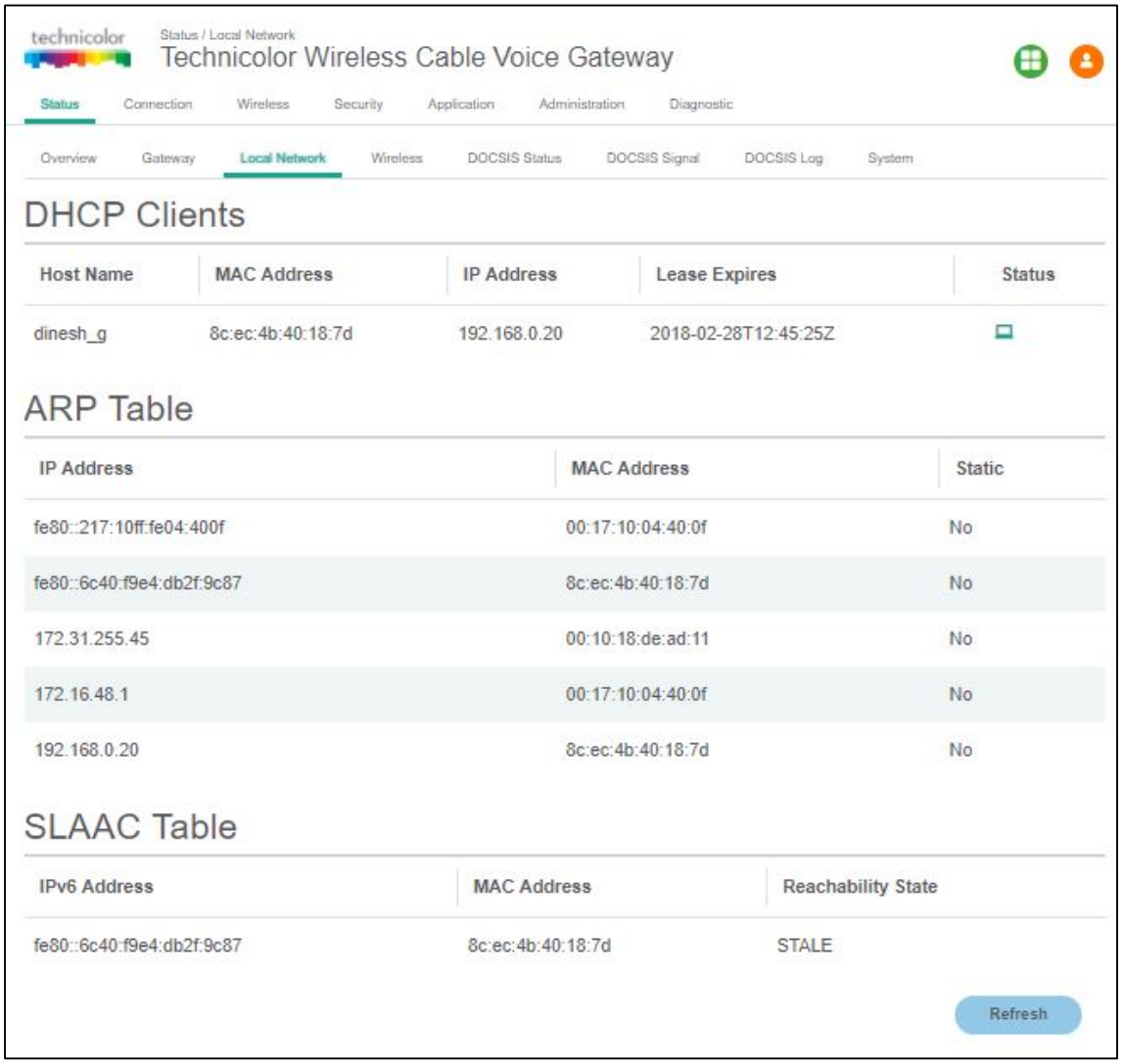


Figure 5.5

When in IPv6 mode or Dual Stack mode, the DHCP Client table includes IPv6 related status and type information.

5.4 Wireless

Status Tab / Wireless

Click on the Status tab then click on the Wireless tab. The page provides wireless network information, including the Network Name (SSID), MAC Address, Security Mode, Network Mode, Channel, Channel Width, SSID Broadcast and Network Status for 2.4GHzand 5GHz.

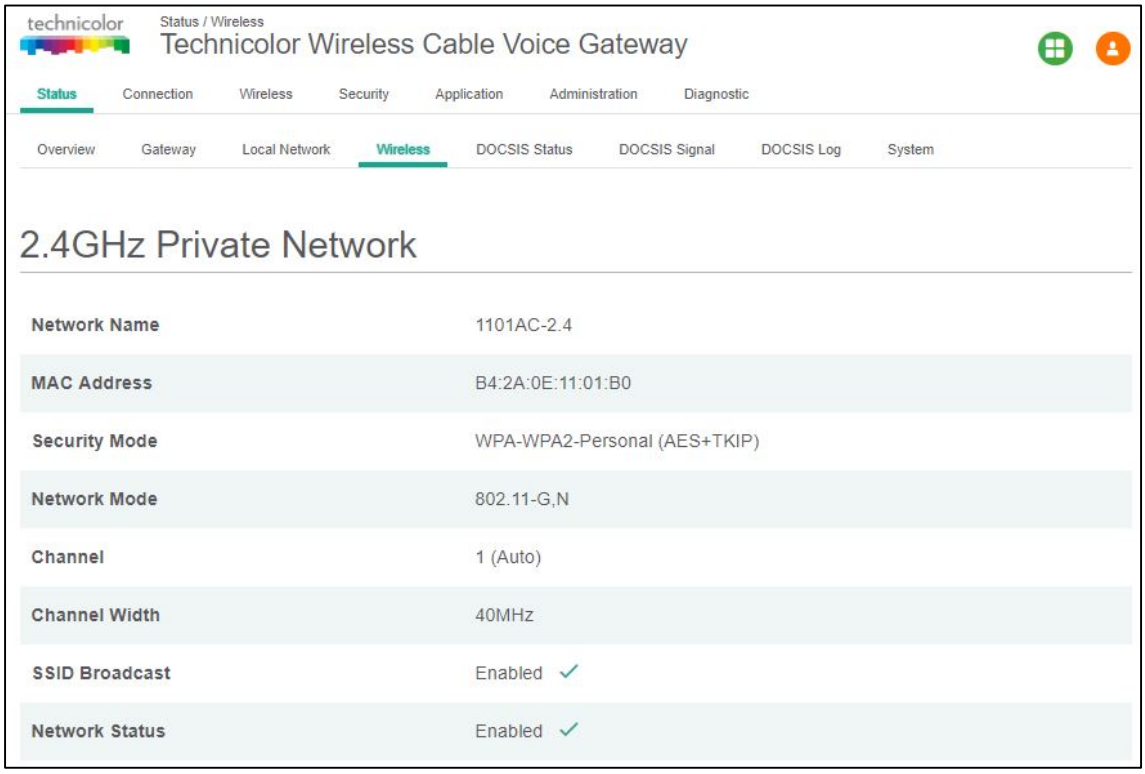

technicolor
Status / Wireless
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Overview
Gateway
Local Network
Wireless
DOCSIS Status
DOCSIS Signal
DOCSIS Log
System
2.4GHz Private Network
Network Name
1101AC-2.4
MAC Address
B4:2A:0E:11:01:B0
Security Mode
WPA-WPA2-Personal (AES+TKIP)
Network Mode
802.11-G,N
Channel
1 (Auto)
Channel Width
40MHz
SSID Broadcast
Enabled
Network Status
Enabled

Figure 5.6

5.5 DOCSIS Status

This page displays status information about the DOCSIS connection.

Status Tab / DOCSIS Status
Click on Status tab, and then click on DOCSIS Status. DOCSIS Status page explains the network connectivity and Cable Modem status. The following information is displayed:

Cable Modem Parameters:
This section displays information about the RF upstream Bonding, including CM Status, Active Time, IPv6 Address, IPv4 Address, Subnet Mask, IP Gateway, TFTP Server, Time Server, Time Offset, DHCP Lease Time, DHCP Rebind Time and DHCP Renew parameters.

- CM Status – possible cable modem status states are other, notReady, notSynchronized, phySynchronized, usParametersAcquired, rangingComplete, ipComplete, todEstablished, securityEstablished, paramTransferComplete, registrationComplete, operational andaccessDenied.
- Active time - The time since the network management portion of the system was last re-initialized.

Ethernet List:
This section displays information about the Ethernet ports and any devices connected to them and show Interface Name, Link Status, Link Speed and Link Duplex parameters.

- Interface name displays Displays the port number in general (Ethernet 1 / Ethernet 2, etc.)
- Link Status - If there is any activity on the Link (Any Device connected) the Link Status is shown as "UP", otherwise it is shown as "DOWN"
- Link Speed and Link Duplex - Speed of 10/100/1000 and is it half duplex, full duplex or Auto

CPE List:
- This section displays the IP Address (IPv4 and/or IPv6) and MAC Address of the devices connected.

The following figures provide these details displayed in the page:

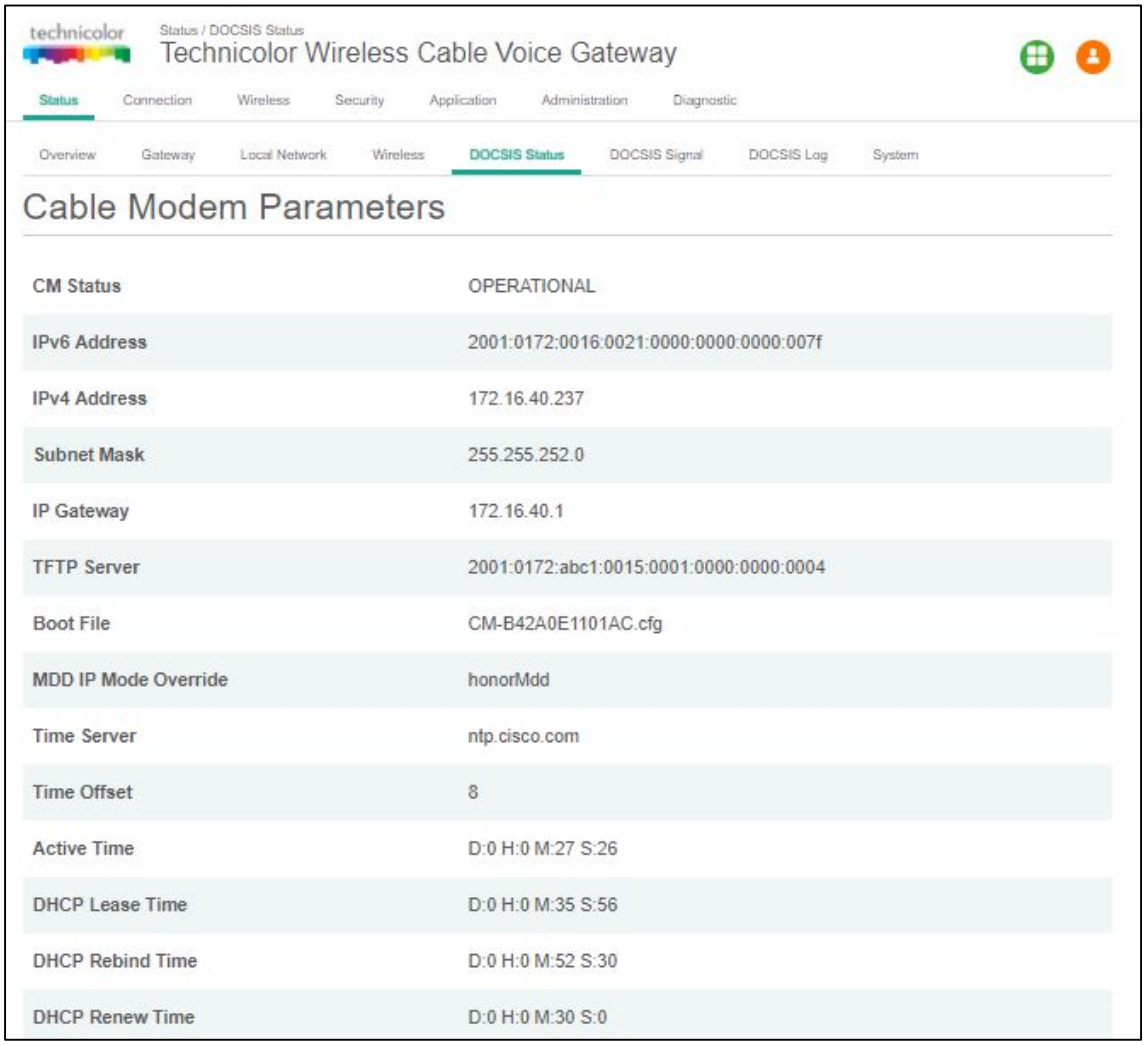

technicolor
Status / DOCSIS Status
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Overview
Gateway
Local Network
Wireless
DOCSIS Status
DOCSIS Signal
DOCSIS Log
System
Cable Modem Parameters
CM Status
OPERATIONAL
IPv6 Address
2001:0172:0016:0021:0000:0000:0000:007f
IPv4 Address
172.16.40.237
Subnet Mask
255.255.252.0
IP Gateway
172.16.40.1
TFTP Server
2001:0172:abc1:0015:0001:0000:0000:0004
Boot File
CM-B42A0E1101AC.cfg
MDD IP Mode Override
honorMdd
Time Server
ntp.cisco.com
Time Offset
8
Active Time
D:0 H:0 M:27 S:26
DHCP Lease Time
D:0 H:0 M:35 S:56
DHCP Rebind Time
D:0 H:0 M:52 S:30
DHCP Renew Time
D:0 H:0 M:30 S:0

Figure 5.7

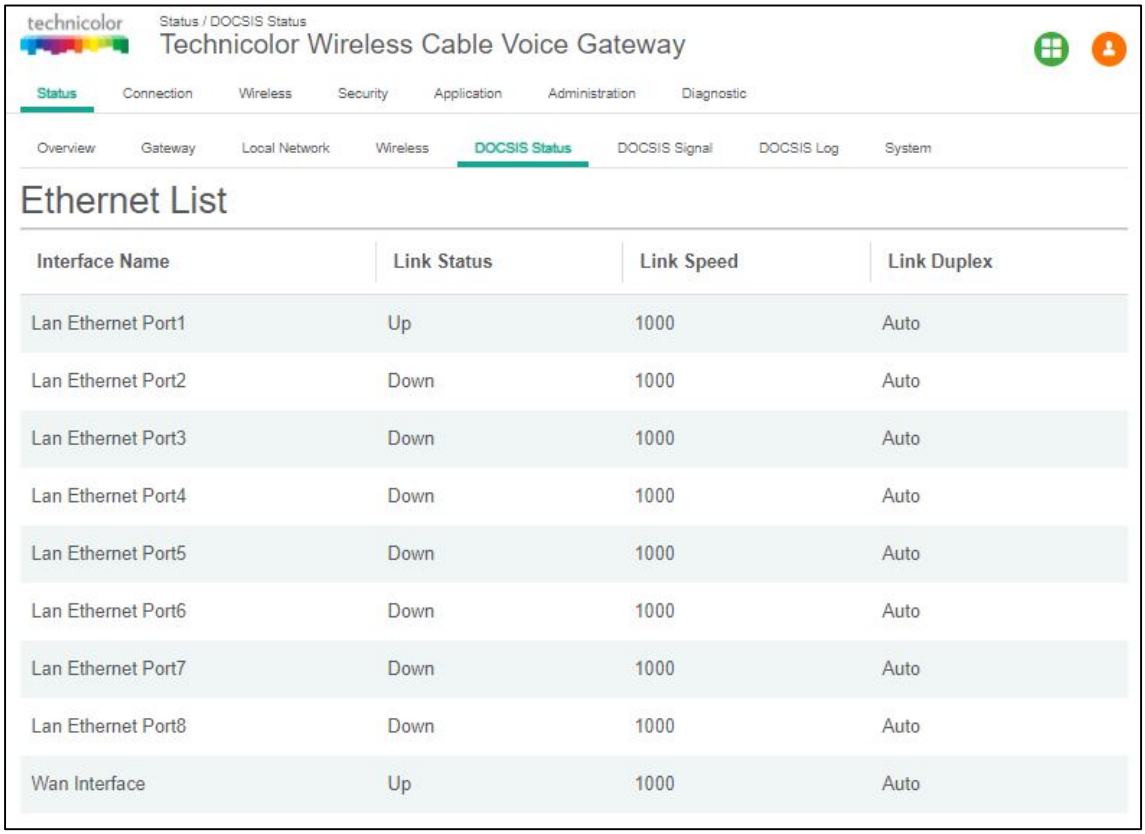


Figure 5.8

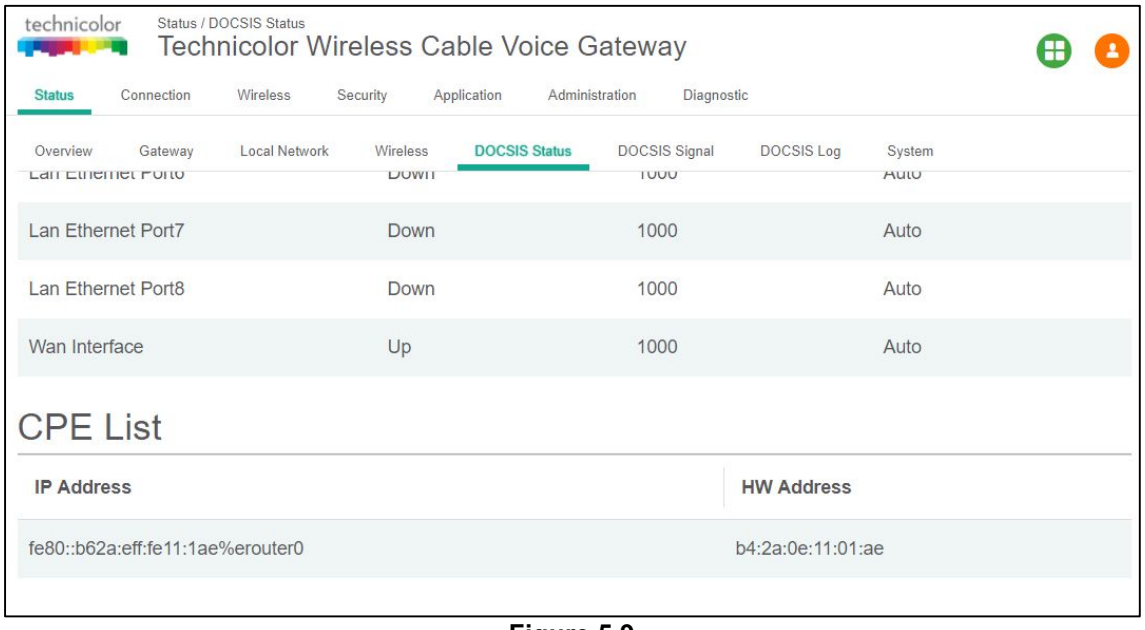


Figure 5.9

5.6 DOCSIS Signal

Status Tab / DOCSIS Signal
The DOCSIS Signal page displays the plant information on which the modem is connected. Click on the Status tab then click on DOCSIS Signal.

Upstream Bonding:
This section displays information about RF upstream Bonding, including upstream channel ID, Upstream Lock Status, Channel Type, Centre Frequency, Band Width, Modulation, and Power Level (Tx Power level at gateway for the particular channel).

- Upstream Bonding - Number of channels locked to upstream which can be used for upstream data transfer
- Upstream channel ID - The CMTS identification of the upstream channel
- Upstream Lock Status- Displays Locked if QAM and FEC are locked (indicates that the channel is usable)
- Upstream Channel Type - Displays if it is a SC-QAM channel (Phy type 3) or a OFDMA channel (Phy type 5)
- Upstream CenterFrequency - The center of the frequency band associated with this upstream interface. Displays 0 if the frequency is undefined or unknown.
- Upstream Band Width-The bandwidth of this upstream interface as configured on the CMTS (Generally 1.6MHz, 3.2Mhz or 6.4MHz)
- Upstream Modulation - Displays the modulation used on upstream ATDMA, TDMA, SCDMA or MTDMA
- Upstream Power Level- Transmit power level at which the cable modem is transmitting on the respective channel

Downstream Bonding:
This section displays information about the RF downstream bonding with downstream channel ID, Downstream Lock status, Downstream Bond Status, Downstream Channel Type, Downstream Centre Freq., Downstream Band Width, Modulation, Power Level (Rx power level at the gateway for the specific channel) and SNR Level.

- Downstream Channel ID-The CMTS identification of the downstream channel within this particular MAC interface. If the interface is down, displays the most current value. If the downstream channel ID is unknown, 0 is displayed.
- Downstream Lock Status -Displays Locked if QAM and FEC are locked (indicates that the channel is usable)
- Downstream Bonding-Number of channels locked to downstream which can be used for downstream data transfer
- Downstream Channel Type -Displays if it is a SC-QAM channel or a OFDM channel
- Downstream Centre Frequency-The center of the downstream frequency associated with this channel
- Downstream Band Width -The bandwidth of this downstream channel. Most implementations are expected to support a channel width of 6 MHz (North America).

- Downstream Channel Modulation -The modulation type associated with this downstream channel. If the interface is down, it displays "unknown", else it will be either QAM64 or QAM256 based on CMTS configuration

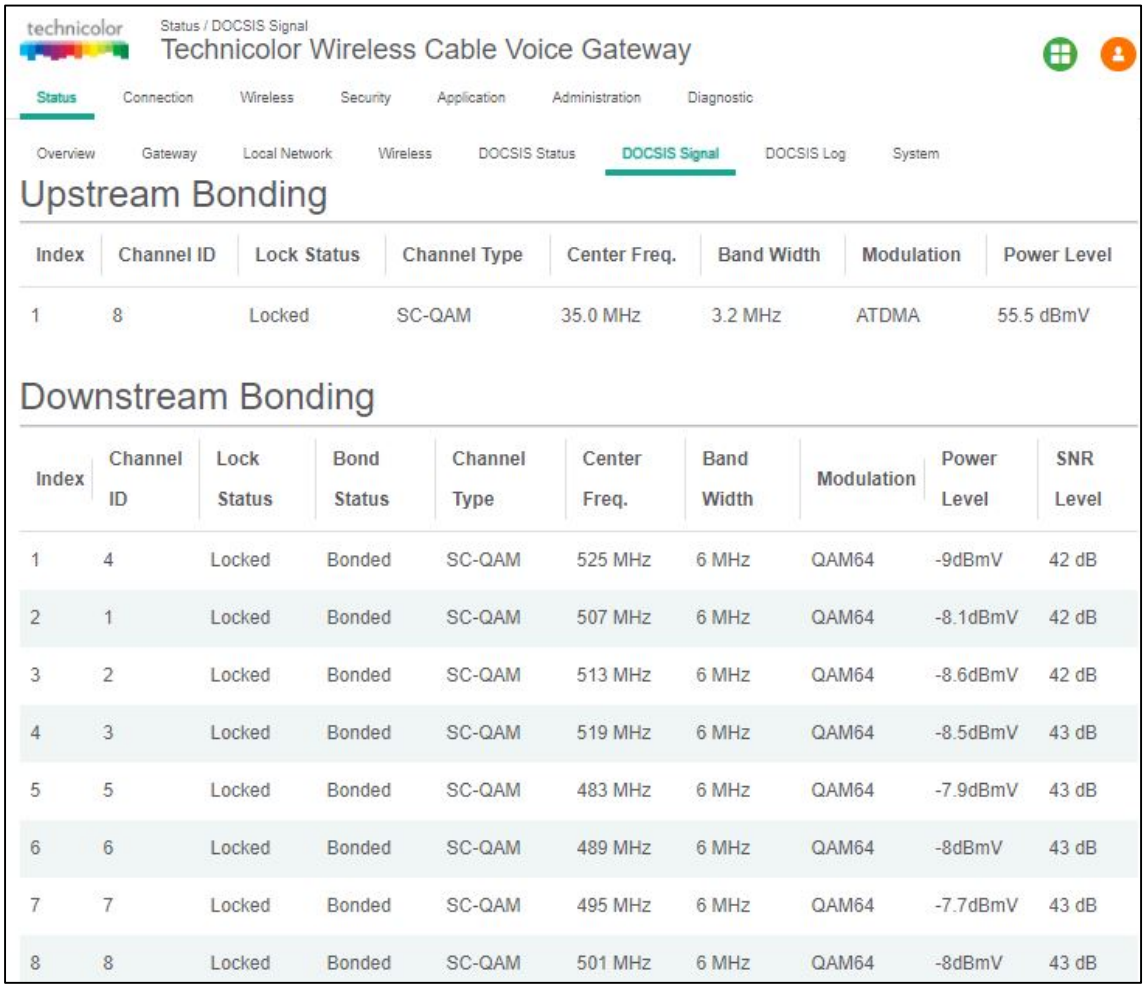


Figure 5.10

Error Codewords:
This section displays Error Codewords, the information about the Channel ID, Unerrored, Correcteds and Uncorrectables.

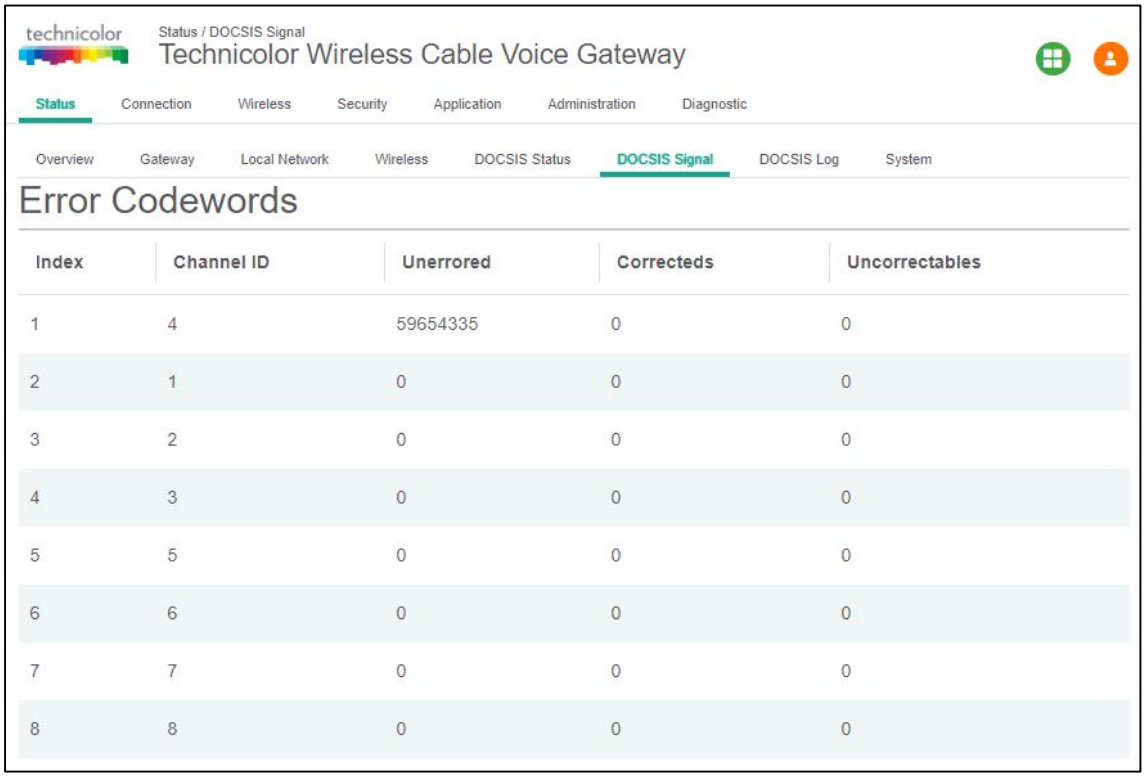

technicolor
Status / DOCSIS Signal
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Overview
Gateway
Local Network
Wireless
DOCSIS Status
DOCSIS Signal
DOCSIS Log
System
Error Codewords
Index
Channel ID
Unerrored
Correcteds
Uncorrectables
1 4 59654335 0 0
2 1 0 0 0
3 2 0 0 0
4 3 0 0 0
5 5 0 0 0
6 6 0 0 0
7 7 0 0 0
8 8 0 0 0

Figure 5.11

5.7 DOCSIS Log

Status Tab / DOCSIS Log

The page displays information about the DOCSIS Log including Time, ID, Level and Description for the entries. Click on the Status tab then click on DOCSIS Log. The number of entries to be listed can be selected from the drop-down menu corresponding to the “Show entries” field.

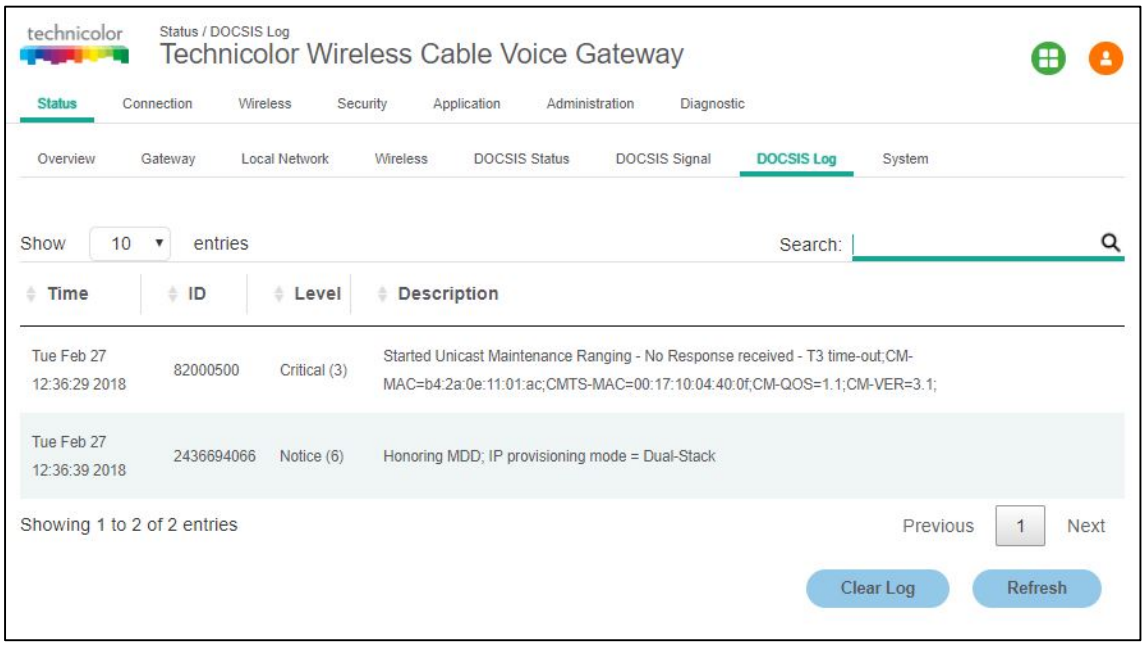


Figure 5.12

5.8 Spectrum Analyzer

CGA4131 Business Gateway supports the Spectrum Analyzer feature, which can monitor a cable plant in real-time. This feature can provide details on the spectrum either via the Web UI or via SNMP MIBs.

There are 3 main features that the spectrum analyzer supports: Run, Hold and Preset.

- A user can click the RUN button and would see real-time measurements being sent by the tuner to the HTTP server and being displayed on the webpage.
- A user could also click HOLD to freeze the spectrum at the last measurement to troubleshoot any issues.
- Clicking PRESET would set the defaults and disable spectrum analyzer.

Status Tab / Spectrum Analyzer

Spectrum Analyzer view is only available for the CM side login.

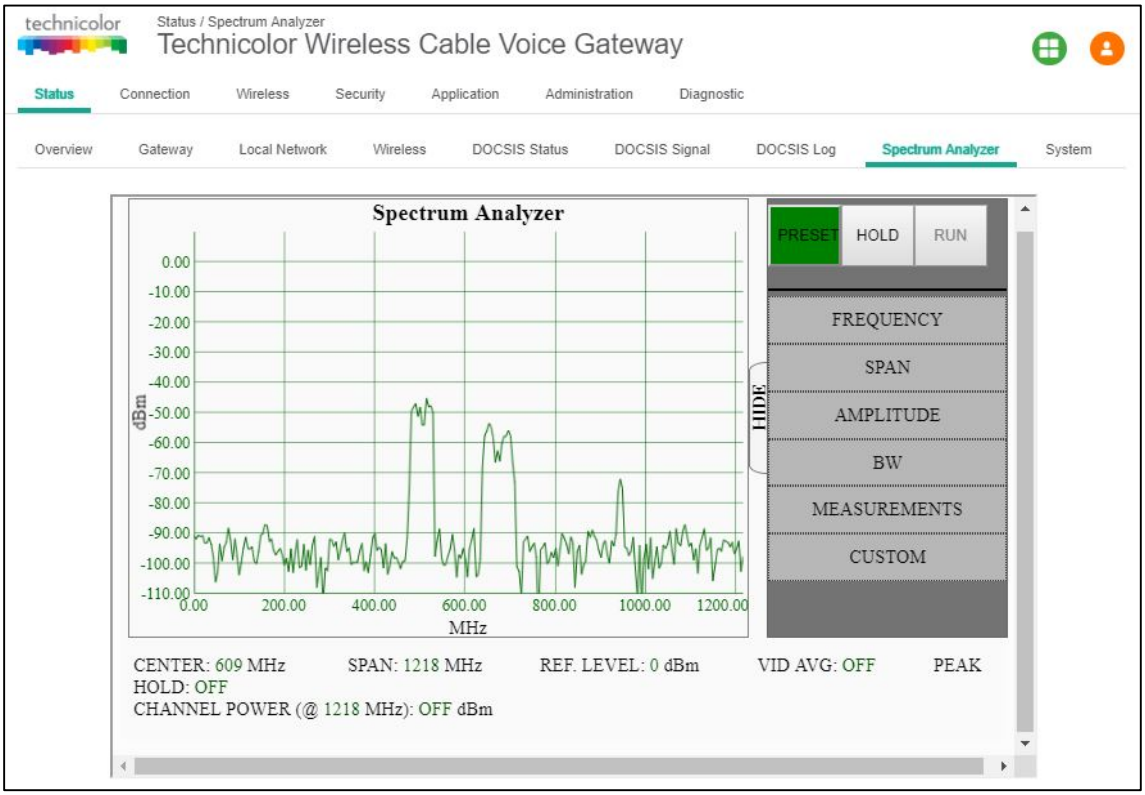


Figure 5.14

By default, the frequency settings have START and STOP at 0 and 1000MHz (1GHz) by default and the center being at 500MHz.

Run - Spectrum Analyzer Graph will start with set parameter from the following options:

- Frequency - show 3 options to set the X-axis starting Point (START), Ending point (STOP) and Middle point (CENTER)
- Span - The duration of Frequency can be varied. For ex: 100 MHz the scale of X-axis is 10 units.
- AMPLITUDE - To set the Y-axis (dBm) upper limit values. The graph will adjust accordingly
- BW – Bandwidth option shows 2 options Vid Avg and Peak Hold for bandwidth. Either one of them can be "ON" at any time.
- MEASUREMENTS – This option helps to switch the feature "ON" and get the power values (dBm) at a particular Frequency. The value should be less than the span value.

- CUSTOM - After clicking Birth Certificate Capture button, It'll be showing "Capture Started..." and wait for the "Capture Complete!" message. After that graph will start again.

A user can then change the various parameters to suite the required measurements using the Web UI options.

5.8.1 SNMP provisioning for Spectrum Analyzer

The spectrum analyzer feature can be controlled via SNMP in order to collect the data from the demodulators as well as change various parameters. The following MIBs are supported:

tchCmSpectrumAnalysis
tchCmSpectrumAnalysisFrequency
tchCmSpectrumAnalysisAmplitudeData
tchCmSpectrumAnalysisEnable
tchCmSpectrumAnalysisInactivityTimeout
tchCmSpectrumAnalysisDiagnosticMode
tchCmSpectrumAnalysisFirstSegmentCenterFrequency
tchCmSpectrumAnalysisLastSegmentCenterFrequency
tchCmSpectrumAnalysisSegmentFrequencySpan
tchCmSpectrumAnalysisBinsPerSegment
tchCmSpectrumAnalysisWindowFunction
tchCmSpectrumAnalysisEquivalentNoiseBandwidth

5.9 System

Status Tab / System
This page displays further information on the DOCSIS connection, system software and hardware configuration. Click on the Status tab then click on System.

DOCSIS State:
This section displays information about the DOCSIS State including Initialize Hardware, Acquire Downstream Channel, Upstream Ranging, DHCP Bound, Set Time-of-Day, Configuration File Download, Registration and CM Status.

System Software:
This section displays information about the System Software including the Model Name, Vendor, Serial Number, Software Version, Firmware File Name, Firmware Build Time, Bootloader Version, Core Version, Local Time and System Uptime.

System Hardware:
This section displays information about the System Hardware including the Hardware Version, Processor Speed, Flash Size, Total Memory and MAC Address.

The DOCSIS State page is displayed below:

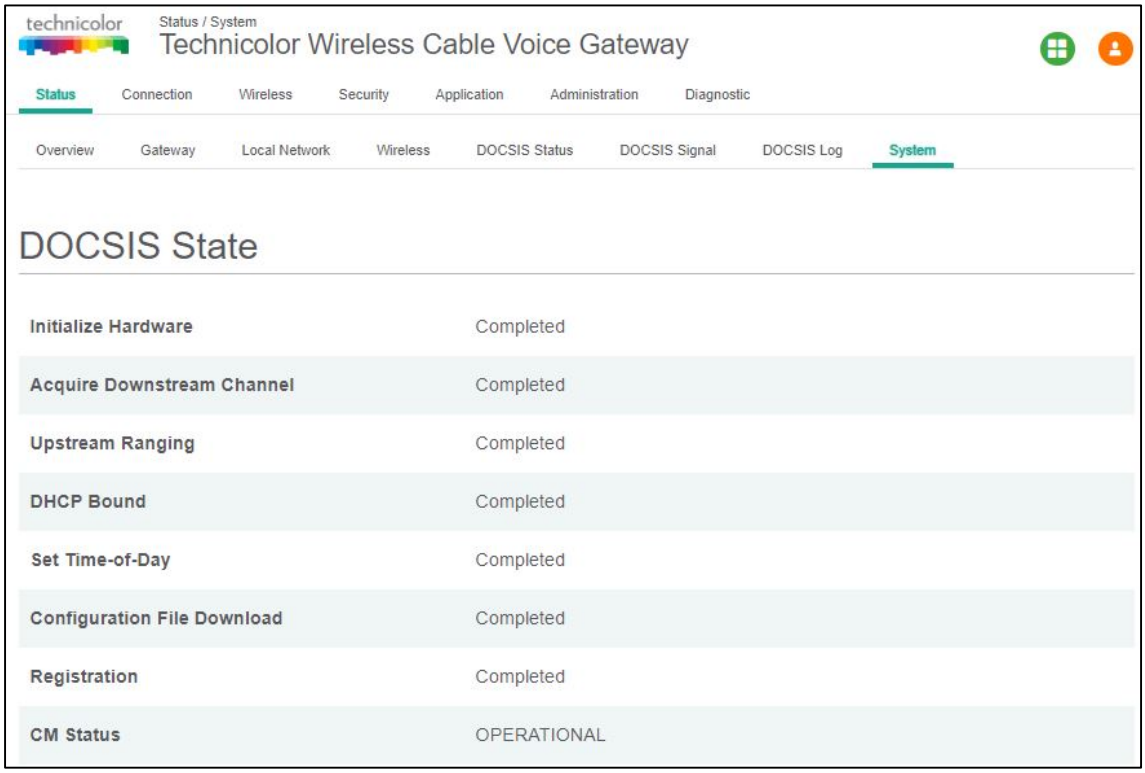

technicolor
Status / System
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Overview
Gateway
Local Network
Wireless
DOCSIS Status
DOCSIS Signal
DOCSIS Log
System
DOCSIS State
Initialize Hardware
Completed
Acquire Downstream Channel
Completed
Upstream Ranging
Completed
DHCP Bound
Completed
Set Time-of-Day
Completed
Configuration File Download
Completed
Registration
Completed
CM Status
OPERATIONAL

Figure 5.14

The System Software information is provided as shown below:

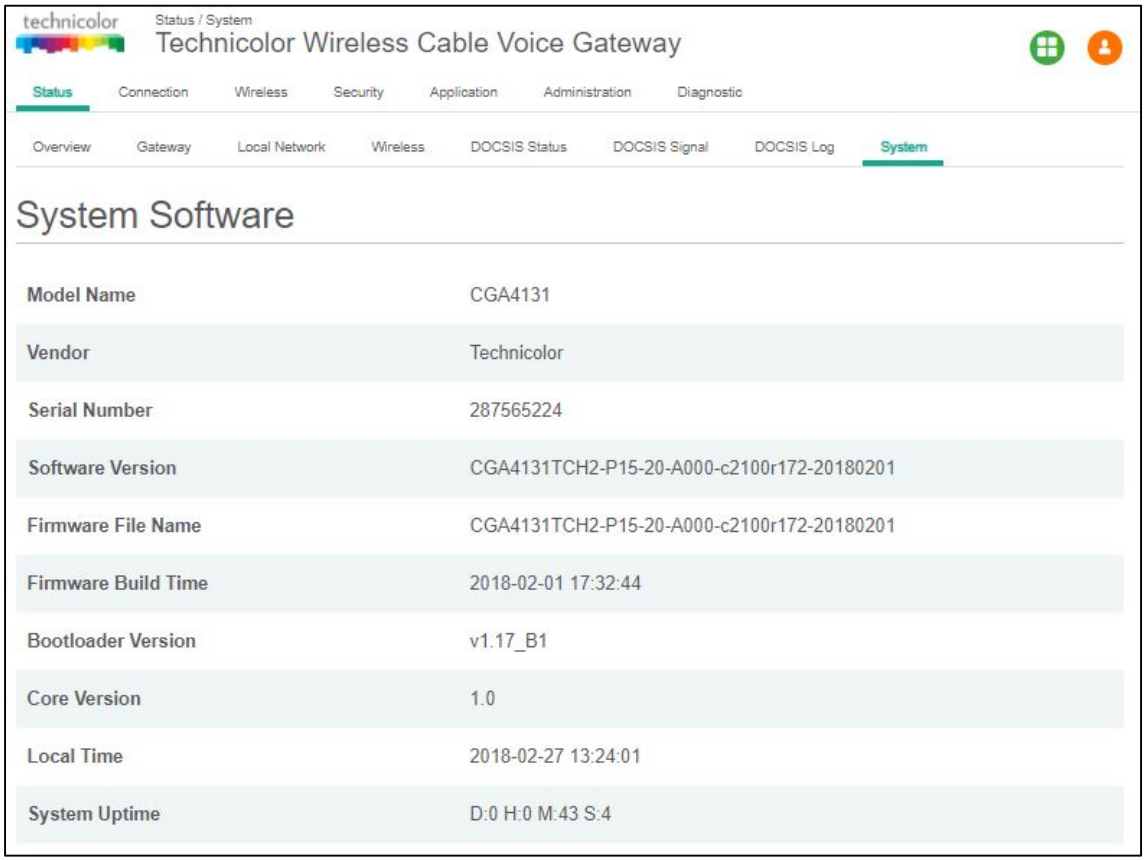


Figure 5.15

The System Hardware information is provided as shown below:

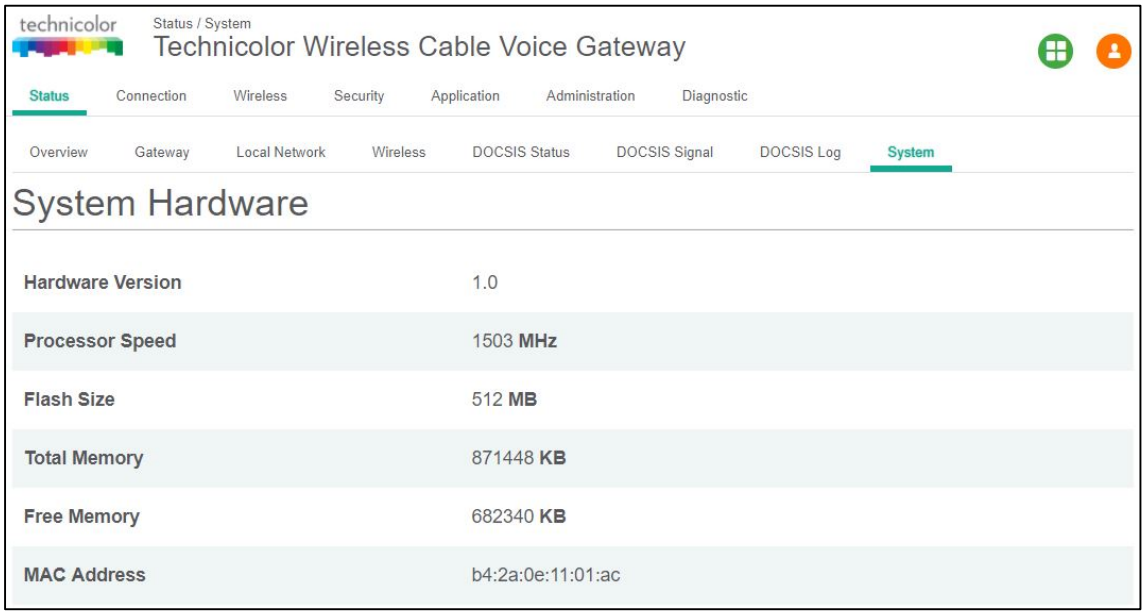


Figure 5.16

6 Connection

Connection Page displays the status and details of client devices that are connected to the gateway. The page also allows users to configure DHCP IP address for the LAN clients or add a device and assign it a static IP address. It also provides an option to configure the gateway in router or bridged mode.

6.1 Devices

Connection Tab /Devices

The Connection/Device page displays all clients that are connected to the private and the public/guest network. The page also displays the details of the connected device like Interface type, connection type, device name and the IP Address.

Click on Connection tab then click on Devices in the Web UI. The devices page appears populated with the information below:

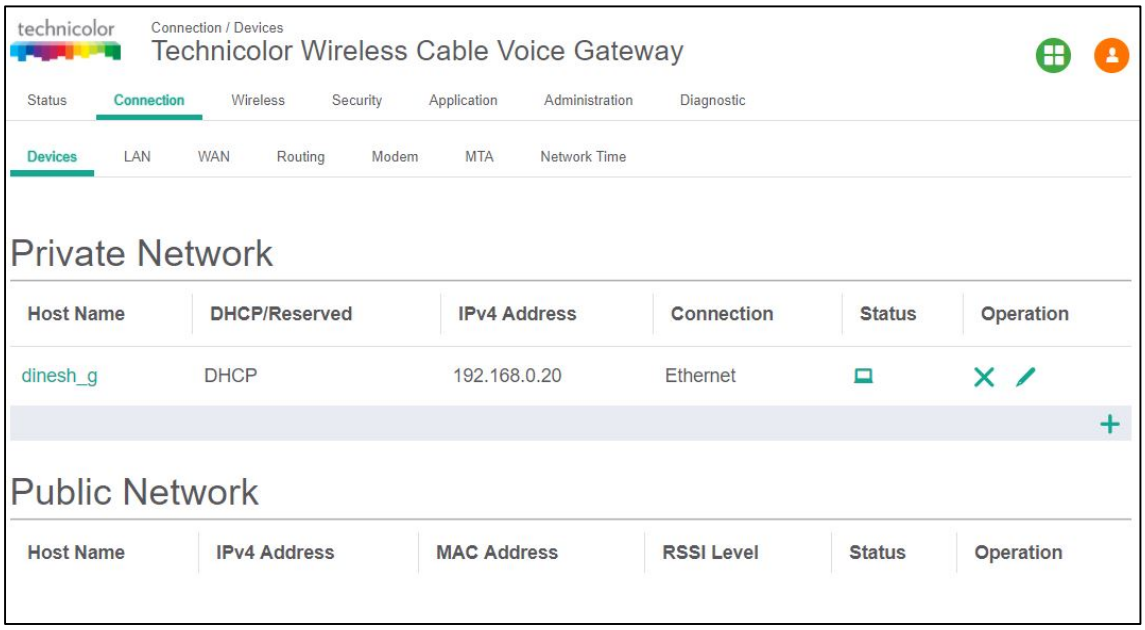


Figure 6.1

6.2 LAN

Connection Tab / LAN

Click on the Status tab then click on Local Network. The page displays details about the LAN configuration. The page also provides options to configure the LAN connections.

LAN Information:

The LAN Information section on the Local Network page displays details about the Gateway Address, Subnet Mask, DHCP details (Server, DHCP Beginning Address and DHCP Ending Address) and DNS details.

Clients connected to the LAN side, which are connected via wired or wireless, get IP addresses from the DHCP server running on the gateway. The beginning and end IP address define how many clients can be connected to the gateway (or the number of valid IP addresses that can be assigned).The gateway address of 192.168.0.1 is the default IP address; it is user configurable.

The user can modify the LAN configuration including the number of IP addresses. If a client needs to be assigned with a static address, the user must select the static IP option and enter the MAC address of the client that needs the static IP address.

The life time of the DHCP address is defined in the DHCP lease time and again it is user configurable. By default, the lease time is 86400 seconds.

The eRouter supports DNS Passthrough - The gateway implements a Dnsmasq, which caches the DNS entries for the LAN requests. In case the entry is not present, the gateway would resolve them with DNS server in the WAN network.

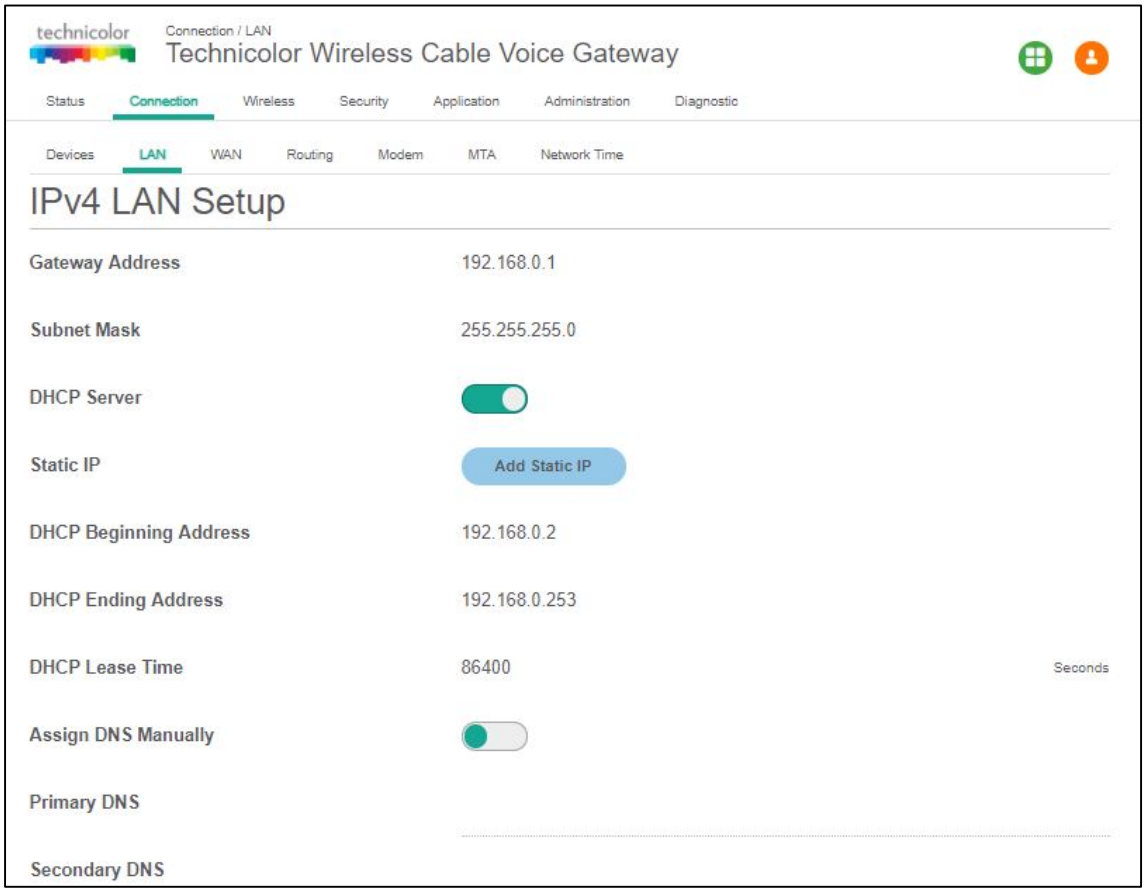
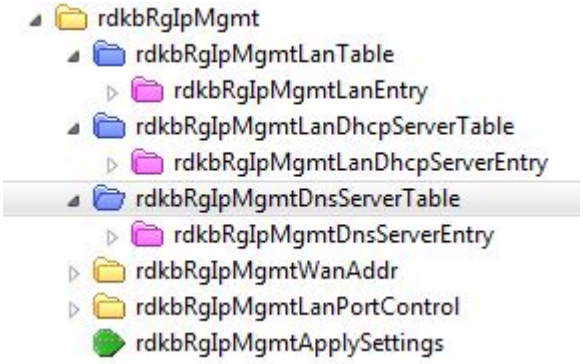


Figure 6.2

6.2.1 SNMP provisioning for LAN

The following table depicts the LAN Configuration MIBs supported:

No	MIB	Description
1	**rdkbRgIpMgmtLanTable**	LAN configuration Table
2	**rdkbRgIpMgmtLanDhcpServerTable**	DHCP Server Details
3	**rdkbRgIpMgmtDnsServerTable**	DNS Server Details
4	**rdkbRgIpMgmtApplySettings**	Set the changes to LAN entry



6.3 WAN

6.3.1 User provisioning for WAN

Connection Tab / WAN

The page displays WAN configuration information. Click on the Connection tab then click on the WAN tab. The page also allows the setting of WAN configuration - Working Mode (Router Mode, Bridged Mode), Connection Mode (DHCP, Static IP), Host Name and Domain Name.

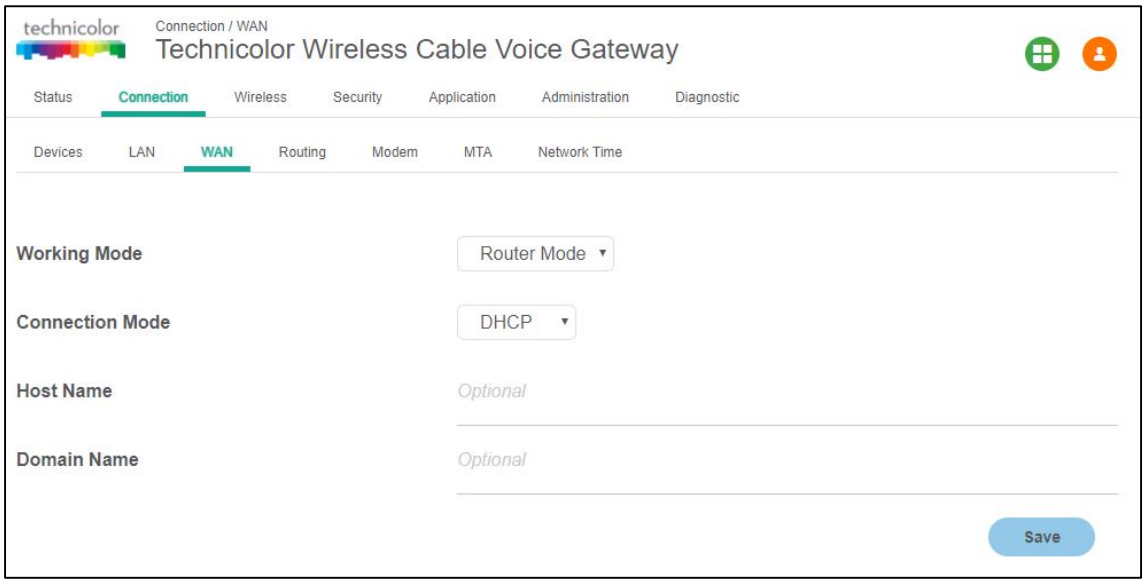


Figure 6.3

When the gateway WAN provisioning is enabled with DHCP, IPv4 and IPv6 DHCP client on the gateway will initiate DHCP request to get the eRouter / WAN IP for the gateway. In case of DHCP v6, the eRouter IP is got from the MSO network through IP Prefix delegation.

6.3.1.1 Working Mode

The gateway can be setup in Bridge or Router mode using this drop-down option, which allows specific configuration of the device to Router or Bridge Mode for access and security.

In Router mode, routing functionality is enabled in the gateway. All the LAN and Wi-Fi clients get local IP addresses from the DHCP server. The NAT functionality in the gateway translates the private IP to the eRouter IP for external Internet access. When the gateway is provisioned with dual stack, then DHCP v6 and v4 servers run in the gateway for the LAN clients.

In Bridge mode, the routing functionality is disabled (DHCP and NAT functionalities are similarly disabled).All LAN clients receive public IPs from the MSO .The Wi-Fi network is not enabled in Bridge mode.

Router Mode:
The default option is Router Mode. Routing functionality is enabled with Wi-Fi and LAN set to active. The management IP address will change LAN configuration (such as from x.x.x.x to y.y.y.y. For instance, it may change from 10.0.0.1 to 192.168.0.1.)

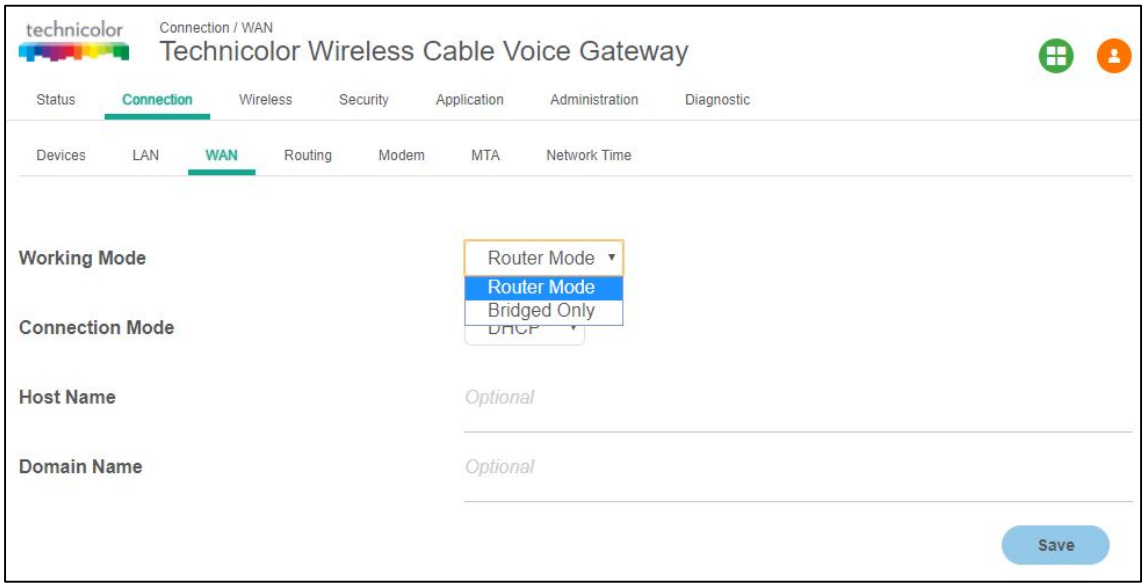


Figure 6.4

Bridge Mode:
If Bridge Mode option is selected, the device reboots automatically and operates in Bridge Mode after reboot. Routing functionality is disabled. All 8 LAN ports remain active in Bridge mode and receive a bridged/public IP when a client is connected. The management IP address will change to 192.168.100.1. Please record this address for future reference to switch back to Router Mode via the Connection page. The device can also be reverted to Router mode by factory reset via front panel switch.

CAUTION: BRIDGE MODE MAY PREVENT MULTIPLE DEVICES FROM ACCESSING THE INTERNET.

6.3.1.2 SNMP provisioning for Bridge Mode

To configure the device in Bridge mode, set the corresponding interface instance of **rdkbRgIpMgmtLanMode.32** to bridge (1).

6.3.1.3 Connection Mode

There are 2 connection modes possible – DHCP or Static IP. When DHCP is selected, the WAN IP (eRouter IP) is configured automatically by the MSO DHCP Server.

In case of static IP, the details (IP address, Subnet Mask, Default Gateway, DNS configuration, MTU, etc.) needs to be obtained from the MSO and entered through the Web UI.

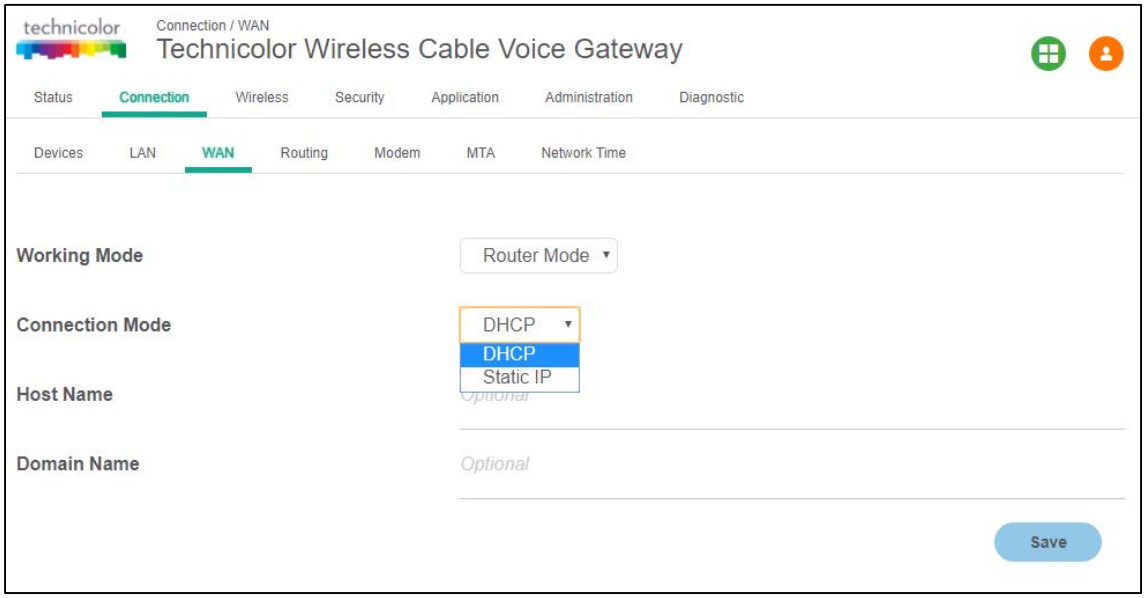


Figure 6.5

Provisioning WAN IP through DHCP

When the WAN Connection Mode is selected as DHCP, no more user settings will be available to configure WAN IP. The WAN side will receive an IP address as per the rules specified in the DHCP configuration of the MSO/ISP.

Provisioning with Static IP

The Static IP for WAN interface is provided by the Service Provider.

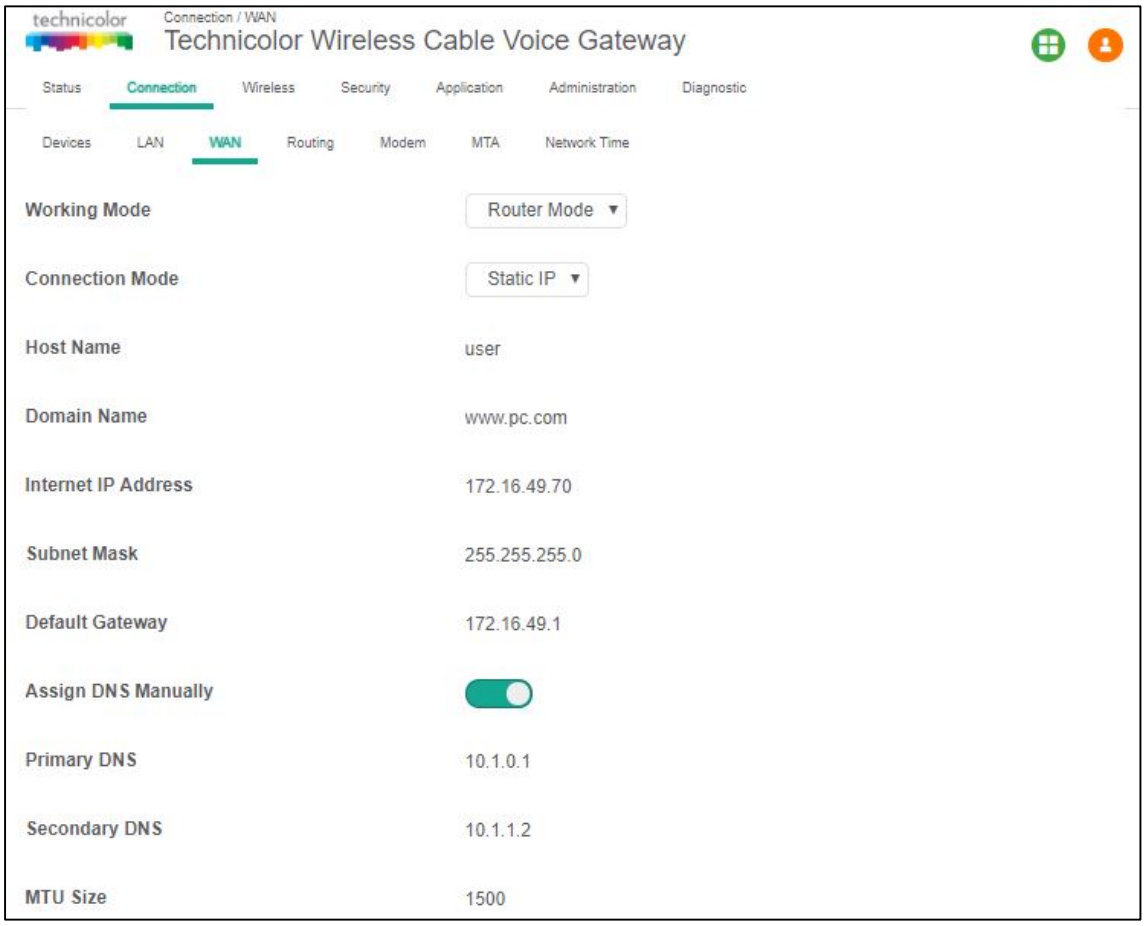


Figure 6.6

While configuring the Connection Mode as Static IP, the user needs to configure the following:

Internet IP Address

The gateway's IP address, as seen from the Internet

Subnet Mask

The gateway's Subnet Mask

Default Gateway

The IP address of the service provider's server

Primary DNS (Required) and **Secondary DNS** (Optional)
Primary and Secondary DNS (Domain Name System) server IP addresses provided by the service provider. At least one is required.

Host Name (Optional)
The Host Name field is optional but may be required by some Internet Service Providers. The default host name is the model number of the device.

Domain Name (Optional)
Enter the local domain name for the Network.

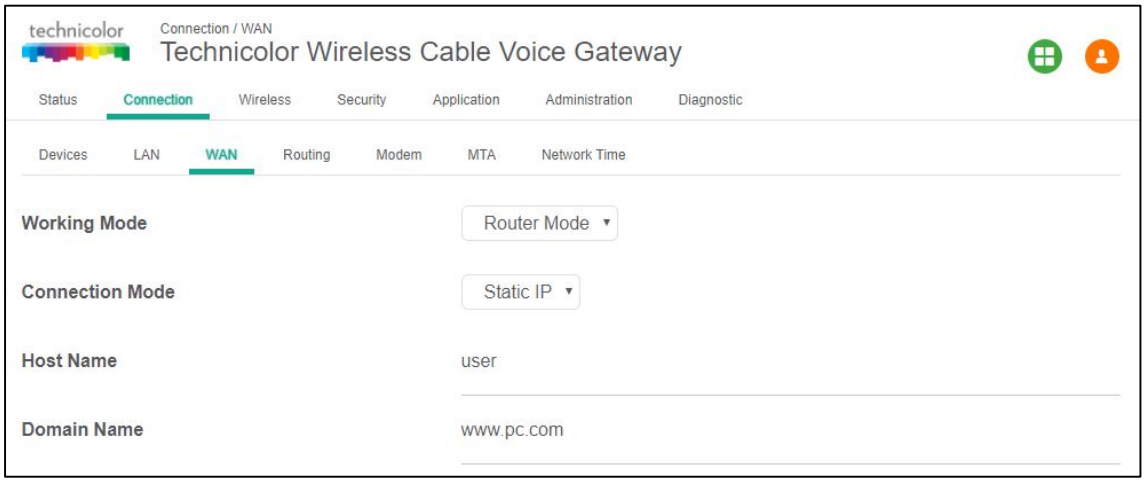
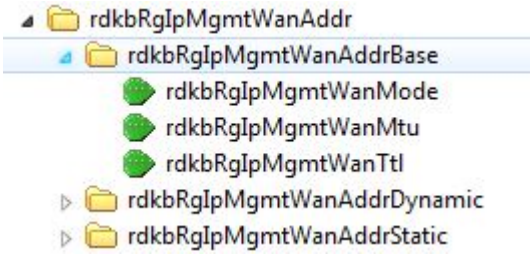


Figure 6.7

Setting the values of different parameters (Working mode, Connection Mode, Host name, Domain name):

- Click on the corresponding drop down menu and select the required values.
- Press Save.

6.3.2 SNMP provisioning for WAN



6.3.3 Dual Stack Router

In dual stack configuration, eRouter will have both an IPv4 and IPv6address.This can be utilized with a dual stack for the cable modem to make sure that the gateway can support a mix of devices that support IPV4 and IPv6.

To set eRouter in Dual IP stack (IPv4 and IPv6), set TLV 202 to Dual or set rdkbRgDeviceMode to dualstack (5).

6.3.4 eSAFE

The eRouter is specified as an Embedded Service/Application Functional Entity (eSAFE) device as defined in DOCSIS specifications and is implemented in conjunction with a DOCSIS cable modem device. The below MIBs object provides visibility to control over the initialization Mode and a mechanism to soft reset DOCSIS eRouter eSAFE element:

- **esafeErouterInitModeControl** - The **esafeErouterInitModeControl** object is used to change the eRouter Mode after the eRouter has initialized.Whenever the value of **esafeErouterInitModeControl** is changed from the default of honoreRouterInitMode (5) via an SNMP SET, the eRouter MUST override the eRouter Initialization Mode encoding encapsulated in the CM configuration file and use the value of the esafeErouterInitModeControl. The other possible values for esafeErouterInitModeControl are ipDisabled (1), ipv4Only (2), ipv6Only (3) and ipv4AndIpv6 (4).

- **esafeErouterSoftReset** - Setting **esafeErouterSoftReset** to true (1) causes the eRouter to perform a soft reset. An SNMP GET/GETNEXT of this object always returns a value of false (2).

- **esafeErouterOperMode** - This object provides visibility to the current mode of operation of the DOCSIS eRouter eSAFE element. If the value of this object is disabled (1), the eRouter eSAFE element has been administratively Disabled. If the value of this object is ipv4OnlyFwding(2), the eRouter eSAFE element is currently operating with the IPv4 protocol stack operational, is forwarding IPv4 traffic, and is not running an IPv6 protocol stack and not forwarding IPv6 traffic. If the value of this object is ipv6OnlyFwding(3), the eRouter eSAFE element is currently operating with the IPv6 protocol stack operational, is forwarding IPv6 traffic, and is not running an IPv4 protocol stack and not forwarding IPv4 traffic. If the value of this object is ipv4AndIpv6Fwding(4), the eRouter eSAFE element is currently operating with both the IPv4 protocol stack and IPv6 protocol stack operational, and is forwarding IPv4 and IPv6 traffic. If the value of this object is noIpv4AndNoIpv6Fwding (5), the eRouter is currently operating with neither the IPv4 nor IPv6 protocol stack running.

6.4 Routing

The routing view enables the user to configure RIP.IGMP Proxy can also be enabled or disabled from this view.

Connection Tab / Routing
Click on the Connection tab then click on Routing. This page displays Routing setup information for RIP. Here, IGMP Proxy can be displayed and set.

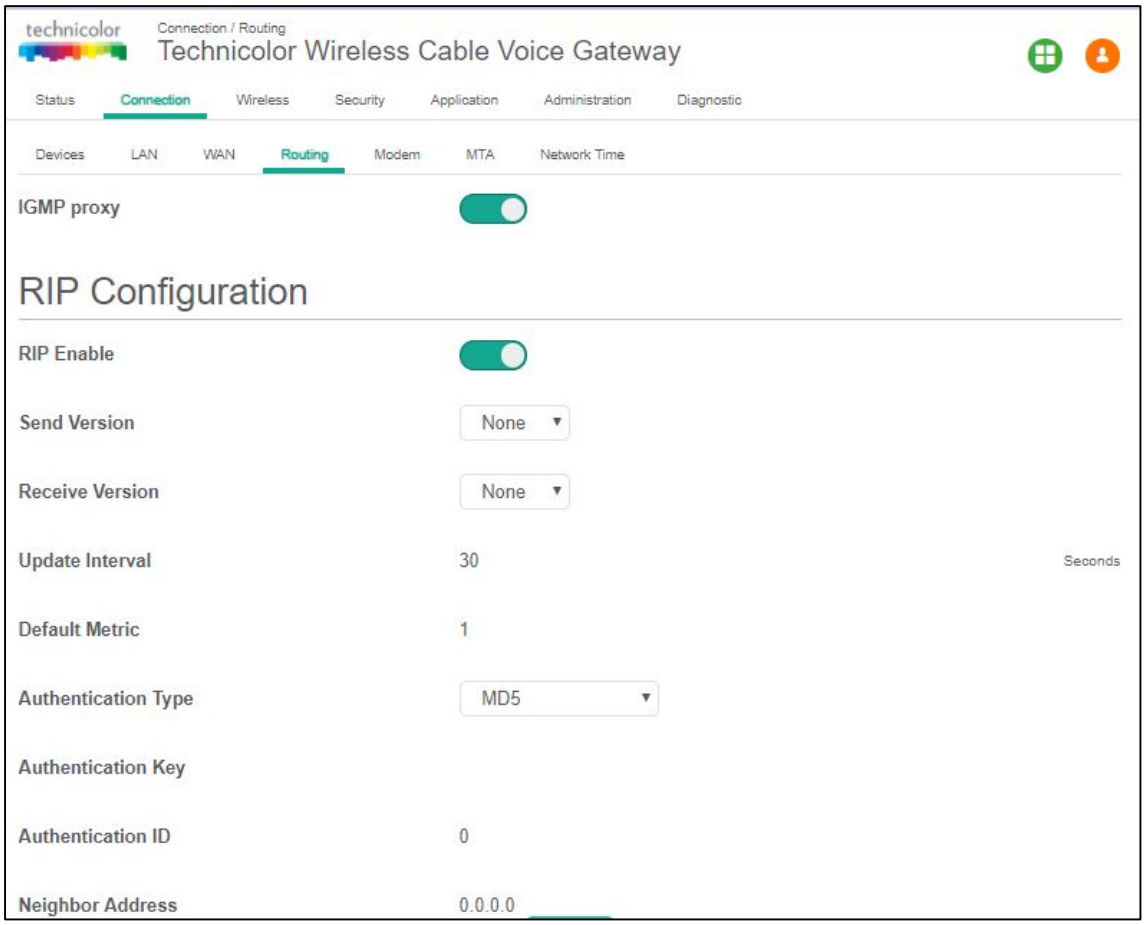


Figure 6.8

6.4.1 Enable / Disable IGMP Proxy

IGMP Proxy is used to enable multicast feature support. Users can enable or disable the IGMP Proxy using by selecting the button on the page.

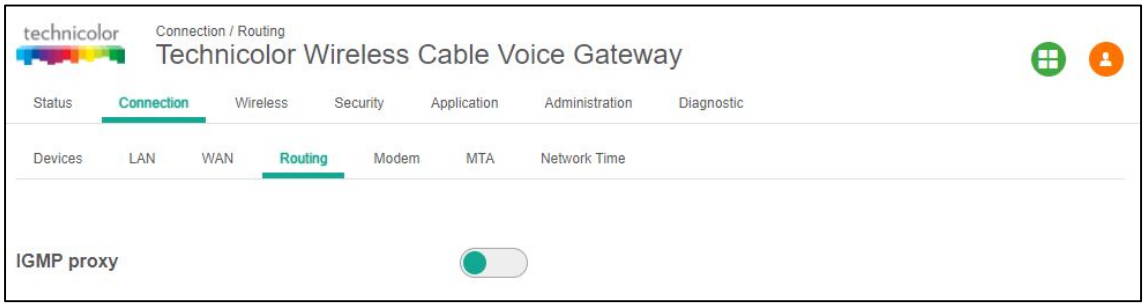


Figure 6.9

6.4.2 RIP

The Routing Information Protocol (RIP) defines a way for routers, which connect networks using the Internet Protocol (IP), to share information about how to route traffic among networks. RIP is classified by the Internet Engineering Task Force (IETF) as an Interior Gateway Protocol (IGP), one of several protocols for routers moving traffic around within a larger autonomous system network -- e.g., a single enterprise's network that may be comprised of many separate local area networks (LANs) linked through routers.To configure the RIP feature, the user needs to provide the following information:

- RIP (enable disable),
- Send Version (Version 2 recommended)
- Receive Version (Version 2 recommended)
- Update Interval (duration between route updates – default 30 seconds)
- Default Metric
- Authentication Type
- Authentication Key
- Authentication ID
- Neighbour Address(Next hop address)

Connection Tab / Routing
Click on the Connection tab then click on the Routing tab. The gateway will display the information below.

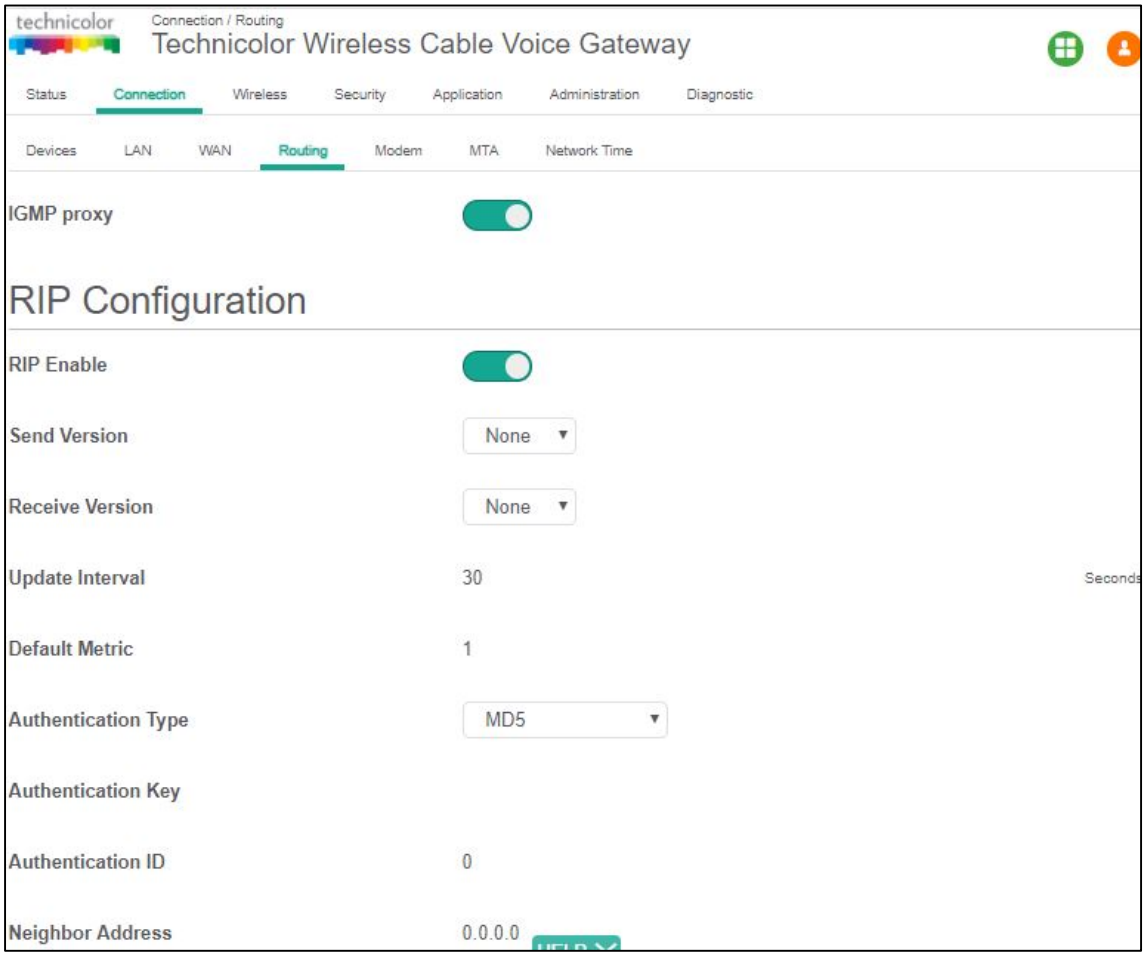


Figure 6.10

6.4.3 User provisioning for RIP

To change the configuration, the user needs to click on the parameters and change the values appropriately and press the save button provided in the page. The specific parameter configurations are explained below:

- RIP can be enabled by selecting the RIP Enable option.
- The send version and receive version can be either 1 or 2. If no version is selected, version 1 would be sent; however both version 1 and 2 can be received
- Update interval configures the time interval between route updates – default value is 30 seconds.
- Metric is a parameter used by RIP in case there are multiple routes were identified to the same destination. The protocol uses the shortest path to route the packets to such destinations and it is determined by the metric parameter. Default value is 1.
- The user needs to select the Authentication type (Text / MD5), Key and ID to complete the authentication configuration.

- Neighbor Address: Defines a neighboring device to which the routing information is exchanged.

6.4.4 SNMP provisioning for Advanced Routing Feature

MaxCPE settings (specific to CM config file)

MaxCPE “N” where “N” is the number of clients (CPE) that can be connected.

In case the customer network is behind a router (Example with customer router), customer subnet needs to be advertised back to the IP backbone network (static configuration).

6.5 Modem

Connection Tab / Modem
Click on the Connection tab then click on the Modem tab. The gateway will display the various modem parameters:

- The **Downstream Frequency** is the frequency at which the modem is locked with the CMTS during channel scan
- **Scan Start Frequency** is the frequency at which the modem tries to lock first, as this will be the frequency at which the modem was able to connect last time and is saved as favorite channel.
- **Upstream Channel ID** is shows locked Upstream Channel Id for Cable Modem.

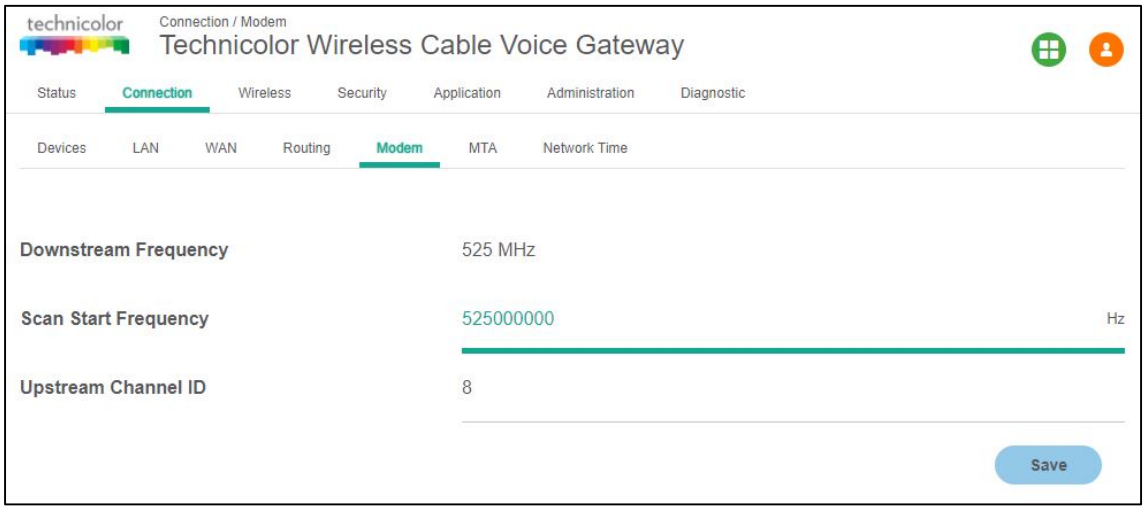


Figure 6.11

6.6 MTA

This page displays the MTA line status and the logs.

Connection Tab / MTA

Click on the Connection tab then click on the MTA. The gateway will display the line status for the 8 MTA line - the status could be shown as onhook / offhook if the MTA is provisioned on the device.

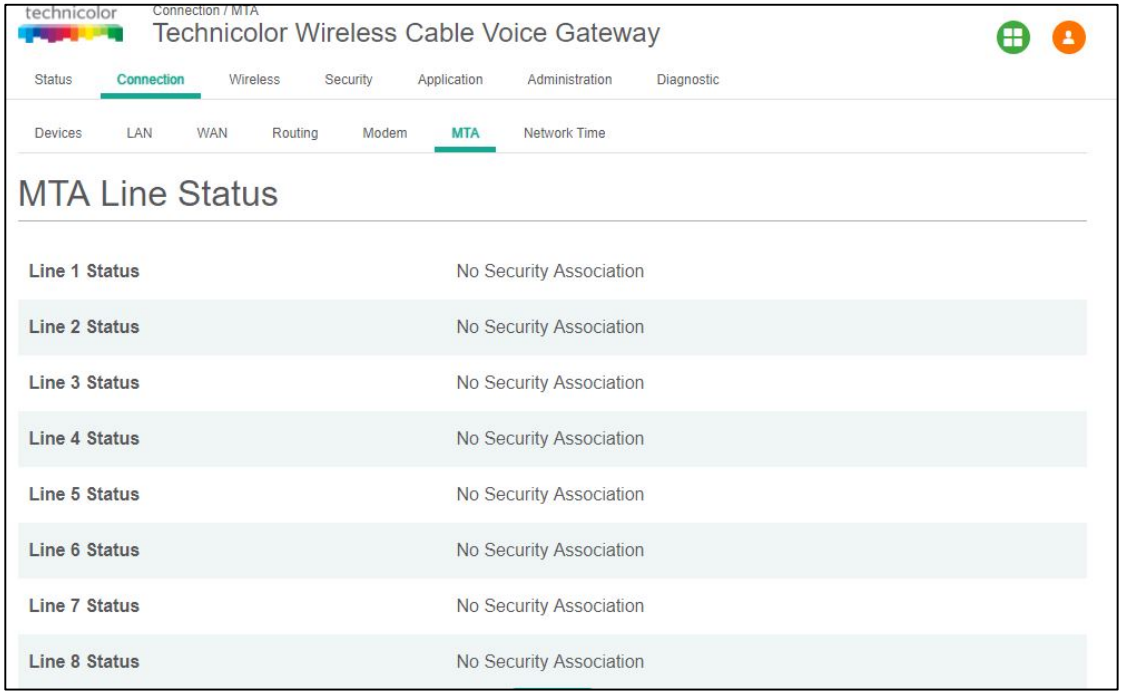


Figure 6.12

The logs will show the details of log generated during MTA operation that includes call status, error message that would be helpful for debugging.

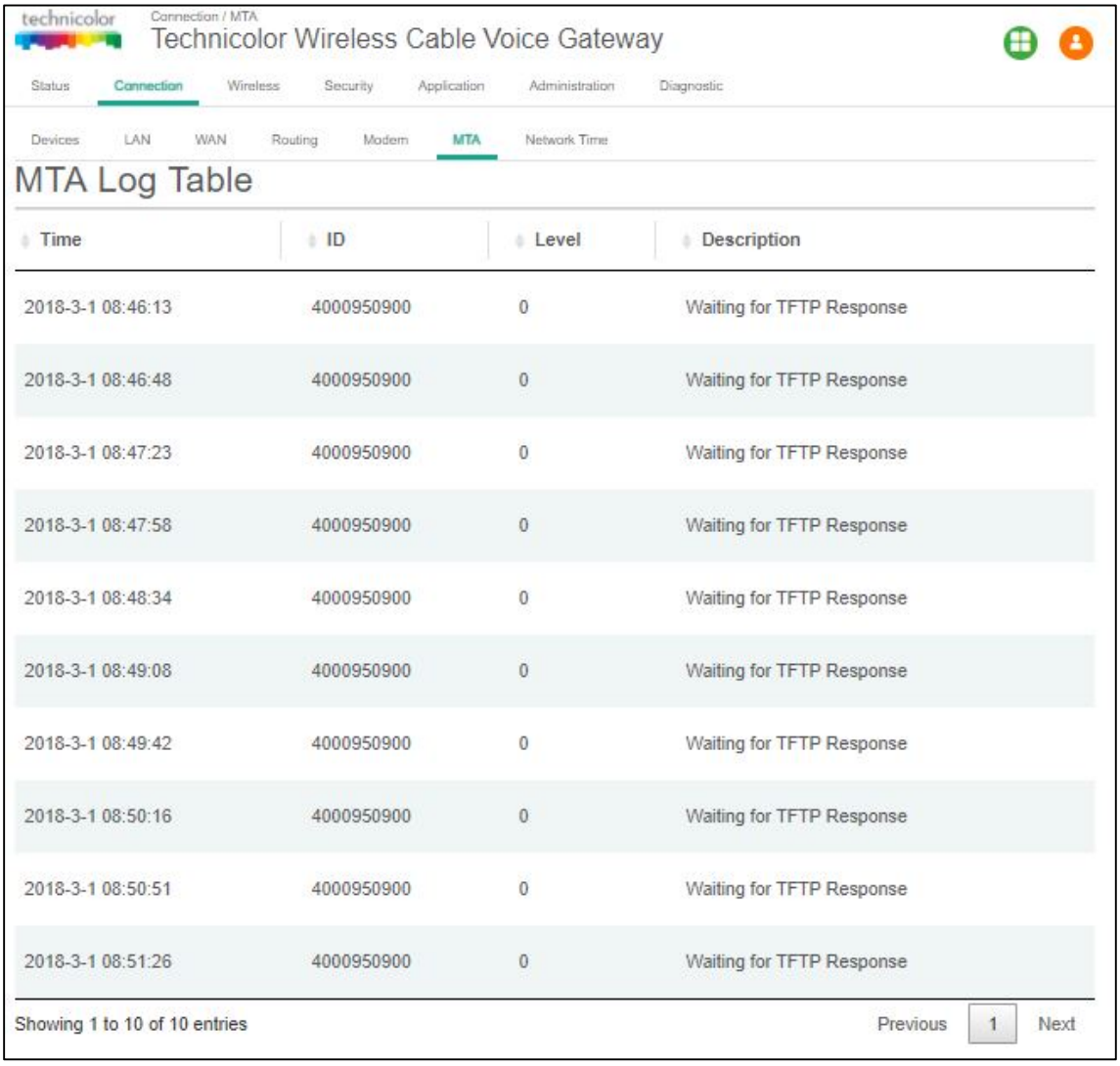


Figure 6.13

6.7 Network Time

Connection Tab / Network Time

Click on the Connection tab then click on the Network Time tab. The network time page will display the various parameters related to current time, NTP server, etc. Options to configure Auto Daylight Saving and Time Zone are provided in this view.

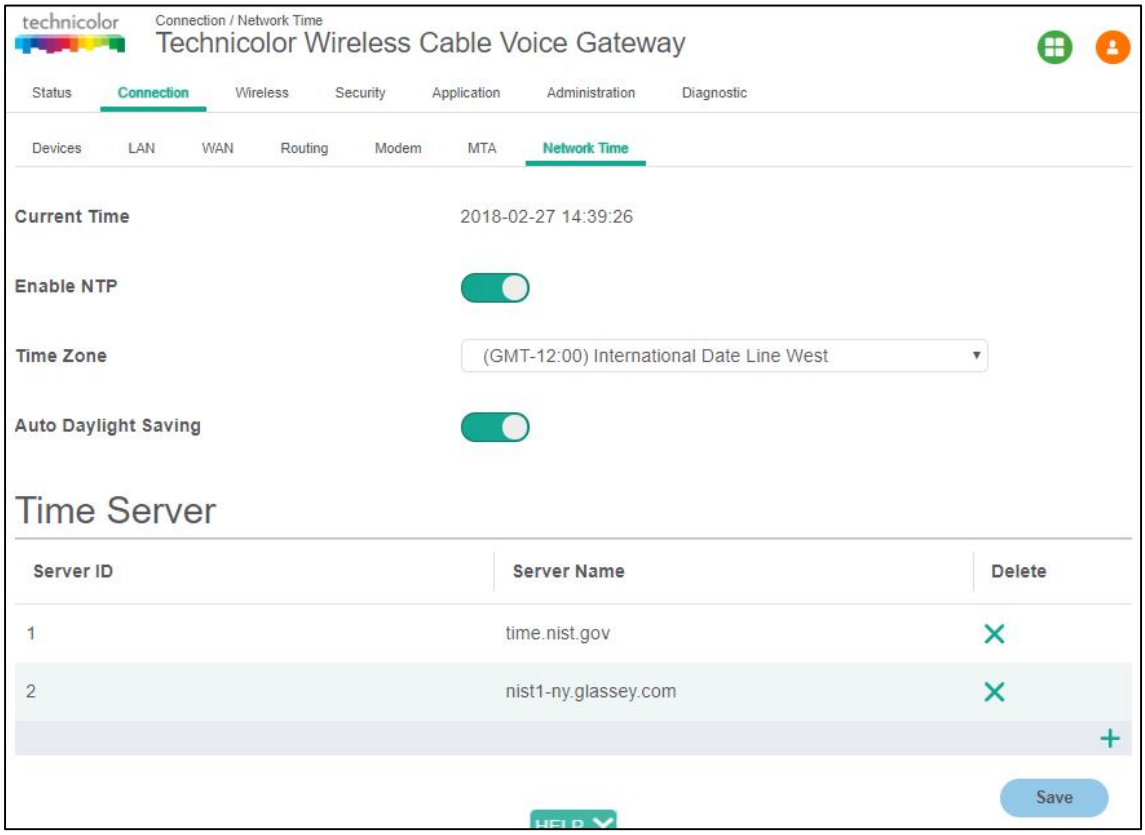


Figure 6.14

The user can change the configurations and press the Save button in the page to change these parameters.

7 Wireless

The CGA4131 TCH2-GA-TBRalso serves as an 802.11 wireless access point (AP).A complete set of the wireless configuration pages described below is presented under the Wireless tab in the Web UI. This section contains the essential configuration items for a wireless network.

7.1 Radio

Wireless Tab / Radio

Click on the Wireless tab then click on the Radio tab. The page displays Radio setup information at 2.4GHz and 5GHz. Here a user can set and display Wireless Network (2.4GHz and 5GHz) information as for Wireless Interface, Network Name, Network Mode, Channel Width, Channel, MAC Address, Scan Nearby AP.

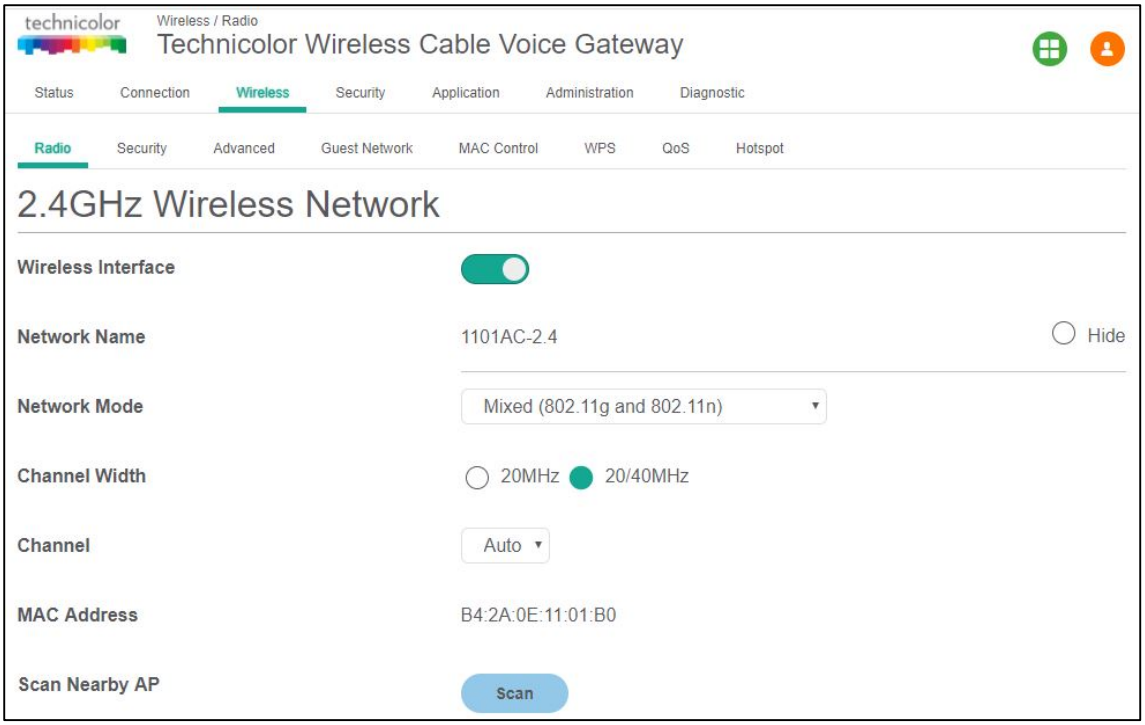


Figure 7.1

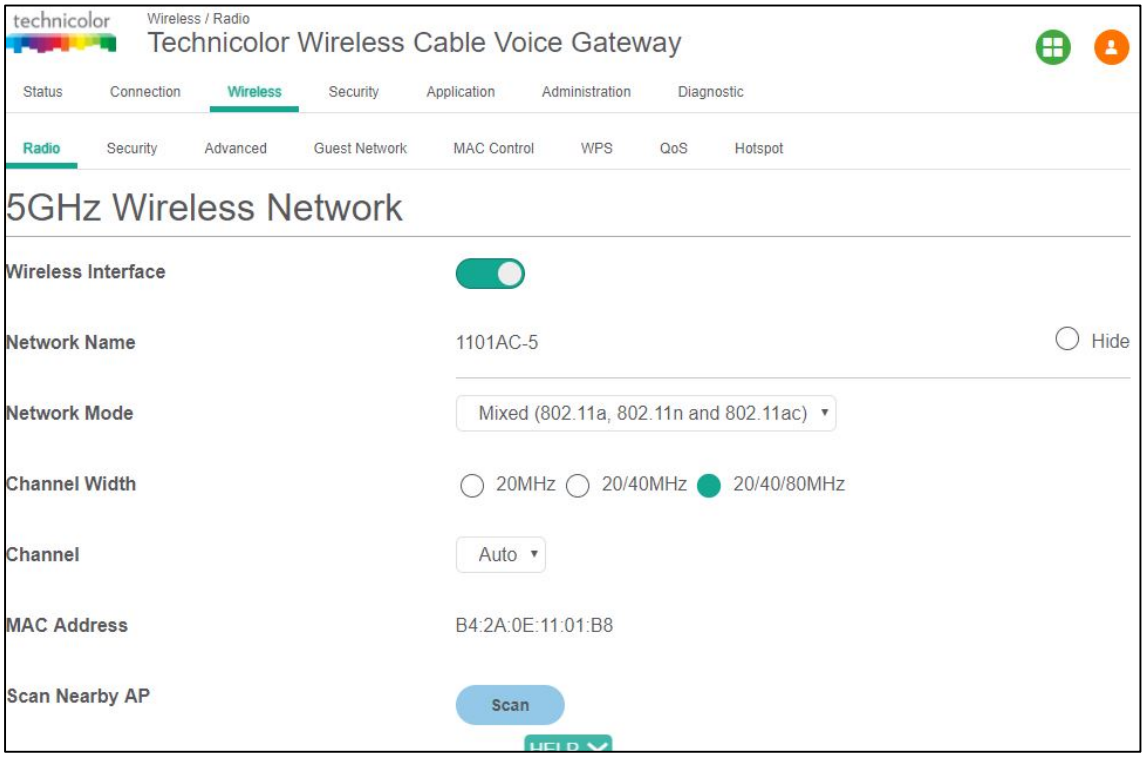


Figure 7.2

Wireless Interface:
The wireless interface can be enabled or disabled with this option.

Network Name:
The Network Name can either be set or displayed under this option. The user can also prevent the network name from being broadcast by selecting the “hide” option.

Network Mode:
The Network Mode determines which 802.11 wireless protocols will be used. The Network Mode has different options available according to the wireless interface:

1. For 2.4GHz: 802.11b only, 802.11g only, 802.11n only, Mixed (802.11b and 802.11g), Mixed (802.11g and 802.11n), Mixed (802.11b, 802.11g and 802.11n).
2. For 5GHz: 802.11a only, 802.11n only, 802.11ac only, Mixed (802.11a and 802.11n), Mixed (802.11n and 802.11ac) and Mixed (802.11a, 802.11n and 802.11ac).

Channel Width:
The channel bandwidth can be selected manually for Wireless-N connections. For best performance in a network using Wireless-N, Wireless-G, and Wireless-B devices, it is suggested to use the AUTO (20 or 40MHz) channel setting. Wireless-N connections will use the 40MHz channel if there is no interference, while Wireless-G and Wireless-B will still use the 20MHz channel. For Wireless-G and Wireless-B networking only, select 20MHz only. Then only the 20MHz channel will be used. For 5GHz the options include AUTO (20 or 40 or 80MHz) the 80MHz will only be used for AC.

Channel:
If AUTO (20 or 40MHz) is selected for the Radio Band setting, then the appropriate Standard Channel setting will be automatically selected, depending on the Wide Channel setting. If only 20MHz is selected as the Radio Band setting, select the appropriate channel from the list provided to correspond with the network settings. All devices in the wireless network must broadcast on the same channel to communicate.

MAC Address:
The wireless MAC Address is displayed in this field.

Scan Nearby AP:
The Scan button provides a mechanism for the AP to scan for neighboring APs and provides various statistics on neighbors.

7.1.1 User provisioning for Radio

Various fields can be configured in the Web UI for provisioning the Radio parameters.

Wireless Interface:

The 2.4GHz and 5GHz wireless interfaces can be enabled or disabled using the options in Figure 7.1 and Figure 7.2.

Network Name:
The network name can either be set/ displayed under this option. The user can also prevent the network name from being broadcast by selecting the “Hide” option.

Network Mode:
Network Mode determines which 802.11 wireless protocols will be used by the gateway. The Network Mode has different options available according to the wireless interface:

3. For 2.4GHz: 802.11b only, 802.11g only, 802.11n only, Mixed (802.11b and 802.11g), Mixed (802.11g and 802.11n), Mixed (802.11b, 802.11g and 802.11n).
4. For 5GHz: 802.11a only, 802.11n only, 802.11ac only, Mixed (802.11a and 802.11n), Mixed (802.11n and 802.11ac) and Mixed (802.11a, 802.11n and 802.11ac).

Channel Width:

User can select Channel Width manually from any of these three options:

1. 20 MHz
2. 20/40 MHz
3. 20/40/80 MHz

Note:

1. Option 2.20/40 MHz is possible in 2.4GHz or 5GHz wireless interfaces but only when Network Mode includes 802.11n or 802.11ac.This is not possible with the selection of only 802.11 b/ 802.11g /802.11a mode.
2. Option 3.20/40/80 MHz is only possible with 5GHz and Network Mode includes 802.11 ac.

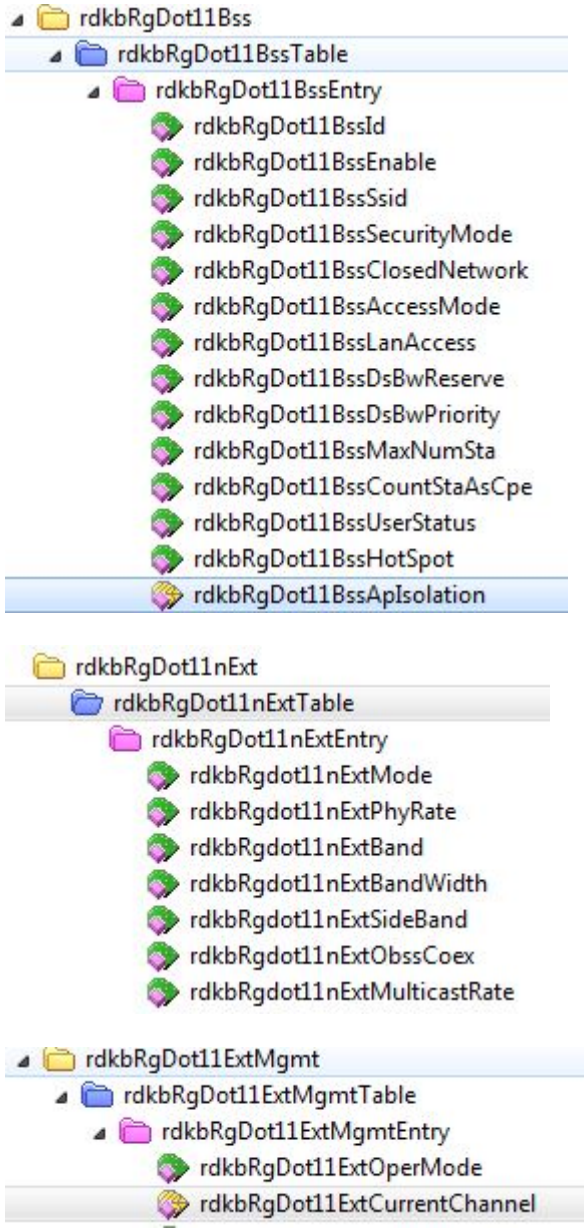
Channel:
User can select either select any one channel accordingly from the available drop down list or can select the gateway to be in AUTO. The recommended setting is to leave the gateway channel selection in AUTO mode so that the CGA4131 can continuously scan and use channels with less interference.

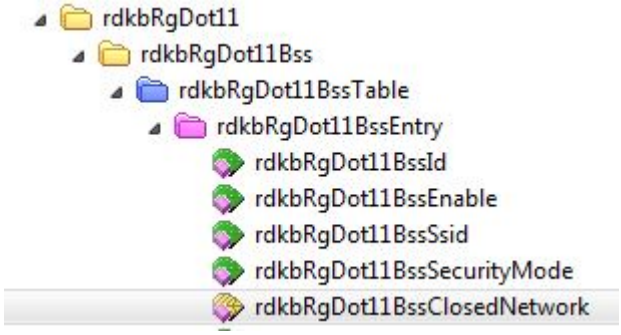
MAC Address:
The wireless MAC address is displayed in this field.

Scan Nearby AP:
The Scan button provides a mechanism for the AP to scan neighboring APs and provides various statistics on neighbors.

7.1.2 SNMP provisioning for Radio

S. No.	MIBs	Description
1	**rdkbRgdot11nExtMode**	**rdkbRgdot11nExtMode** selects the Network Mode
2	**rdkbRgdot11nExtBandWidth**	**rdkbRgdot11nExtBandWidth**selects the channel width for 802.11n operation.
3	**rdkbRgDot11ExtCurrentChannel**	**rdkbRgDot11ExtCurrentChannel**selects the channel. The list of the available channels depends on the radio capabilities and country code.
4	**rdkbRgdot11nExtSideBand**	**rdkbRgdot11nExtSideBand**- This is for N cards only.
5	**rdkbRgDot11BssSsid**	**rdkbRgDot11BssSsid**sets the Network Name (SSID).
6	**rdkbRgDot11BssClosedNetwork**	**rdkbRgDot11BssClosedNetwork**controls whether the Network Name (SSID) will be hidden in the beacon frames or not.


rdkbRgDot11Bss
rdkbRgDot11BssTable
rdkbRgDot11BssEntry
rdkbRgDot11BssId
rdkbRgDot11BssEnable
rdkbRgDot11BssSsid
rdkbRgDot11BssSecurityMode
rdkbRgDot11BssClosedNetwork
rdkbRgDot11BssAccessMode
rdkbRgDot11BssLanAccess
rdkbRgDot11BssDsBwReserve
rdkbRgDot11BssDsBwPriority
rdkbRgDot11BssMaxNumSta
rdkbRgDot11BssCountStaAsCpe
rdkbRgDot11BssUserStatus
rdkbRgDot11BssHotSpot
rdkbRgDot11BssApIsolation
rdkbRgDot11nExt
rdkbRgDot11nExtTable
rdkbRgDot11nExtEntry
rdkbRgdot11nExtMode
rdkbRgdot11nExtPhyRate
rdkbRgdot11nExtBand
rdkbRgdot11nExtBandWidth
rdkbRgdot11nExtSideBand
rdkbRgdot11nExtObssCoex
rdkbRgdot11nExtMulticastRate
rdkbRgDot11ExtMgmt
rdkbRgDot11ExtMgmtTable
rdkbRgDot11ExtMgmtEntry
rdkbRgDot11ExtOperMode
rdkbRgDot11ExtCurrentChannel



7.1.3 Procedure to set SNMP Wireless Settings

Step 1: Set the MIBS that are specific to wirelessRgDot11 (2.4GHz only) or rdkbRgDot11Ext (10001-10008 for 2.4GHz, 10101-10108 for 5GHz) listed in the SNMP reference guide.

Step 2: Set the MIB rdkbRgDot11ApplySettings to 1

7.2 Wireless Security

Wireless Tab / Security

The page displays radio setup information at 2.4GHz and 5GHz.Click on the Wireless tab then click on Security tab. Here, the user can set and display Wireless Network (2.4GHz and 5GHz) information including the Network Name, Security Mode, Encryption, Network Password, and Key Interval.

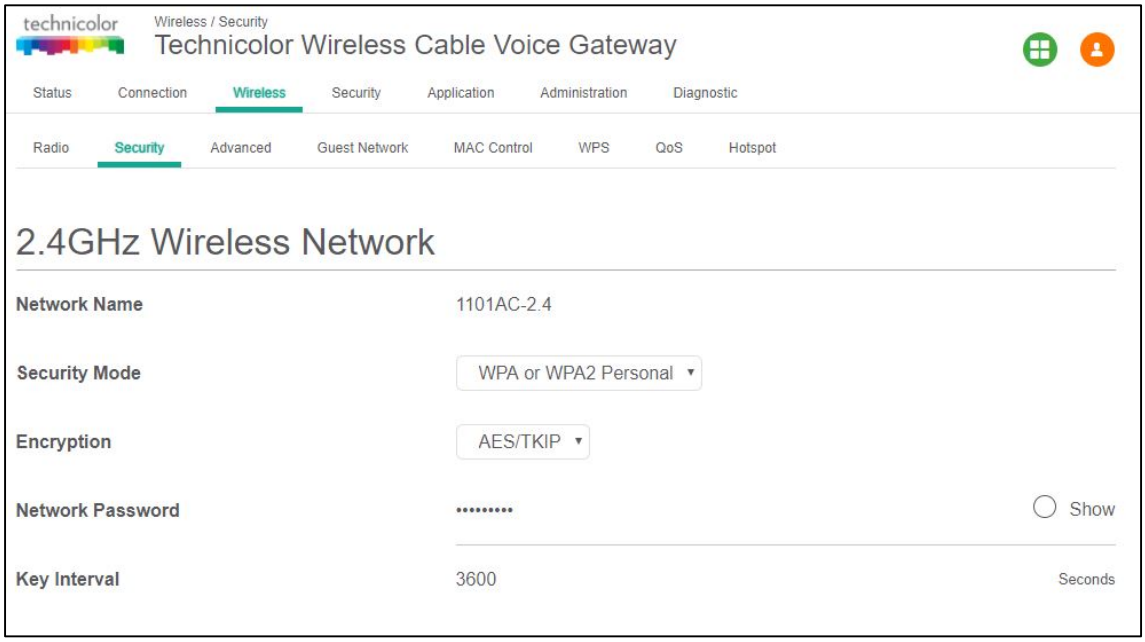


Figure 7.3

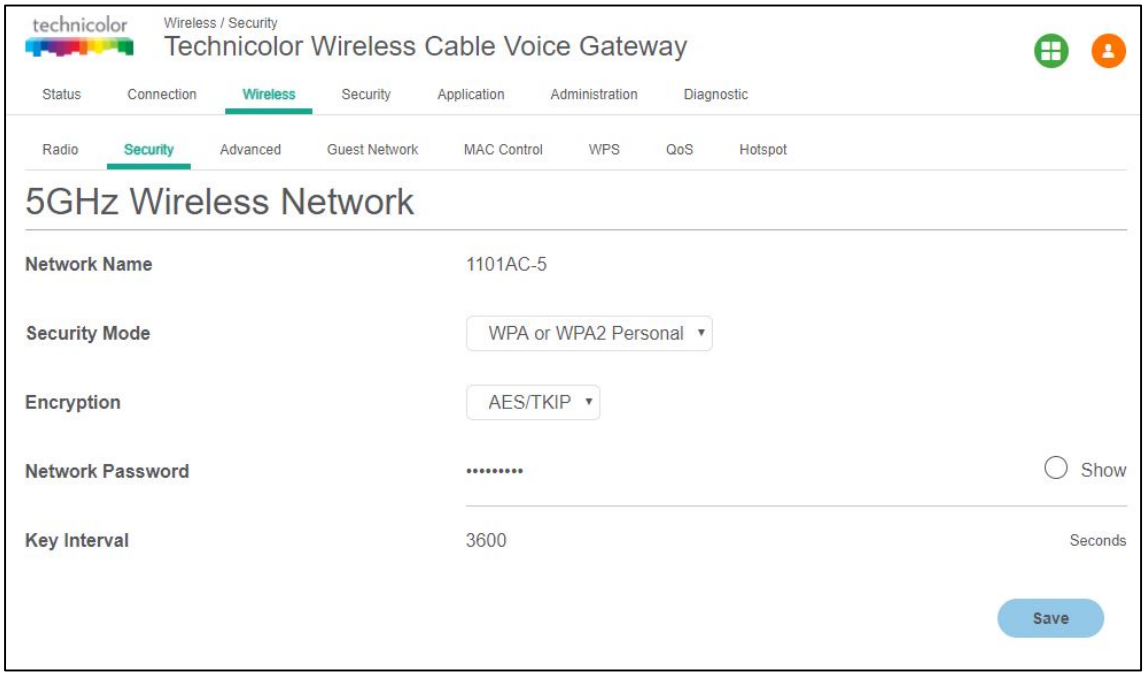


Figure 7.4

7.2.1 User provisioning for Security

Network Name:
The Network Name is displayed here. The user cannot make any changes under this tab.

Security Mode:
The user can select the security mode for 2.4GHz: Open, WPA2 Personal, WPA or WPA2 Personal. For 5GHz the choices are: Open, WPA2 Personal, WPA or WPA2 Personal.

The default setting is WPA or WPA2 Personal.

Encryption:
For ease of use, the encryption mode changes according to the selected security mode.

For example: If the security mode is selected to be “WPA2 Personal”, the selected encryption mode will be AES. Similarly if the security mode being used is WPA or WPA2 Personal, the encryption mode will be AES and TKIP.

Network Password:
The user must select a password that meets the requirements of the encryption type being used:

1. Open: No password needed
2. WPA2 Personal: at least 8 characters.
3. WPA or WPA2 Personal: at least 8 characters.

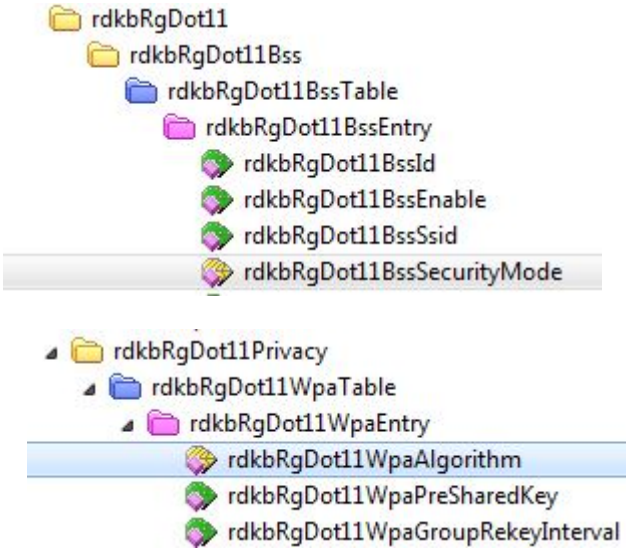
Key Interval:
The default is 3600 seconds.

Note: Do not forget to hit Save tab at bottom of page after making any changes.

7.2.2 SNMP provisioning for Security

S. No.	MIBs	Description
1	**rdkbRgDot11BssSecurityMode**	**rdkbRgDot11BssSecurityMode** sets the security mode for the selected SSID. This is a read-write object.
2	**rdkbRgDot11WpaAlgorithm**	**rdkbRgDot11WpaAlgorithm**sets the encryption for WPA. This is a read-write object.
3	**rdkbRgDot11WpaPreSharedKey**	**rdkbRgDot11WpaPreSharedKey**sets the passphrase or PSK for WPA. This is a read-write object.
4	**rdkbRgDot11WpaGroupRekeyInterval**	**rdkbRgDot11WpaGroupRekeyInterval** sets the rekeying interval for WPA. This is a read-write object.

.



7.3 Advanced Wireless Settings

Wireless Tab / Advanced
The page displays Advanced setup information of the 2.4GHz and 5GHz wireless networks including Beacon Interval, Fragment Threshold, RTS Threshold, Wi-Fi Multimedia (WMM), WMM Power Save and Band Steering Settings: - Band Steering Status, Band Steering RSSIThreshold 2.4GHz, and Band Steering RSSIThreshold 5GHz.

Click on the Wireless tab then click on the Advanced tab.

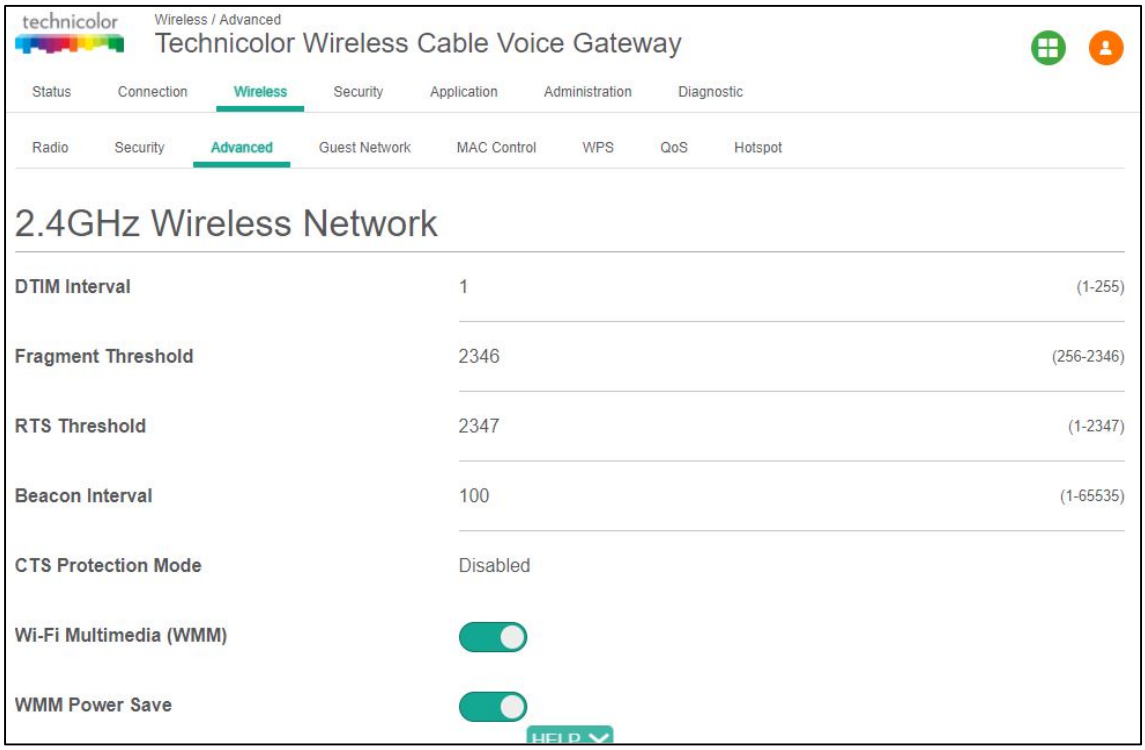

technicolor
Wireless / Advanced
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Radio
Security
Advanced
Guest Network
MAC Control
WPS
QoS
Hotspot
2.4GHz Wireless Network
DTIM Interval
1
(1-255)
Fragment Threshold
2346
(256-2346)
RTS Threshold
2347
(1-2347)
Beacon Interval
100
(1-65535)
CTS Protection Mode
Disabled
Wi-Fi Multimedia (WMM)
WMM Power Save

Figure 7.5

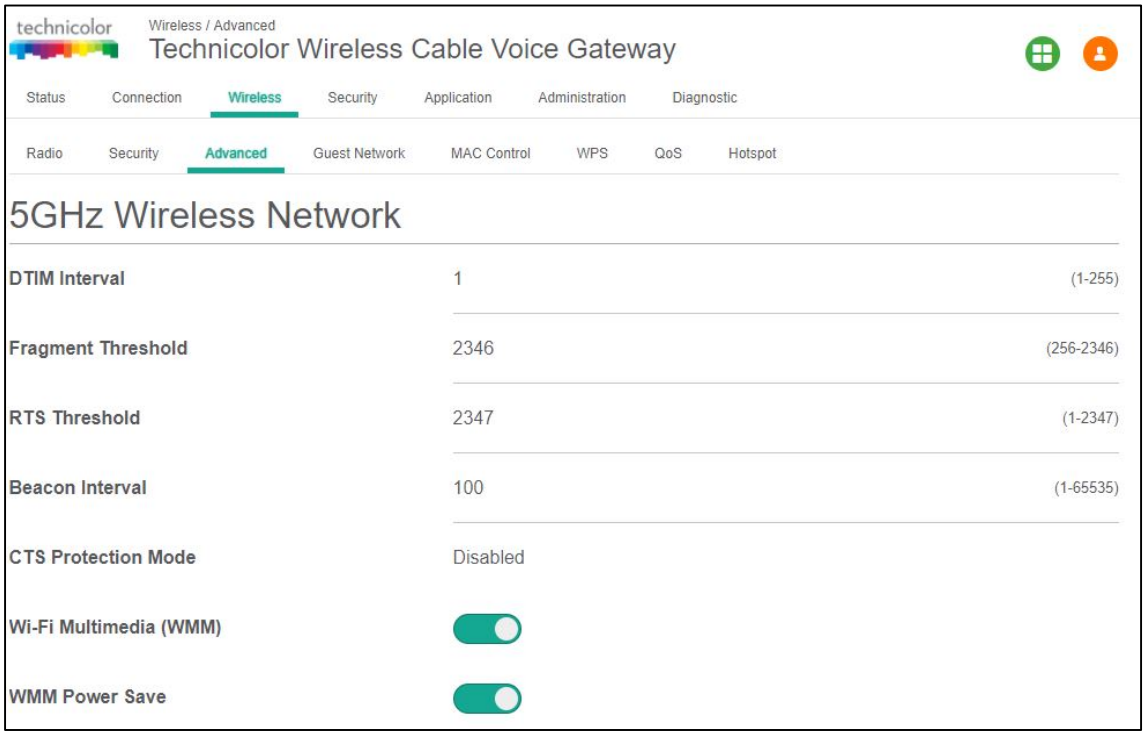


Figure 7.6

7.3.1 User provisioning for Advanced Wireless settings

This screen is used to set up the advanced wireless functions. These settings should only be adjusted by an expert administrator as incorrect settings can reduce wireless performance.

Beacon Interval
The Beacon Interval value indicates the frequency interval of the wireless beacon. A beacon is a packet broadcast by the gateway to synchronize the wireless network. The default value is 100ms.

DTIM Interval
This value indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing a client of the next window for listening to broadcast and multicast messages. When the gateway has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and receive the broadcast and multicast messages. The default value is 1; user can select any other value from 1 to 255.

Fragmentation Threshold:
This value specifies the maximum size for a packet before data is fragmented into multiple packets. In the event of a high packet error rate, the Fragmentation Threshold may be slightly increased. Setting the Fragmentation Threshold too low may result in poor network performance. Only a minor reduction of the default value is recommended.

In most cases, it should remain at its default value of 2346; user can select other value in range between 256 -2346.

RTS Threshold:
In the event of inconsistent data flow, only a minor reduction of the default value, 2347, is recommended. If a network packet is smaller than the pre-set RTS Threshold size, the RTS/CTS mechanism will not be enabled. The device sends Request to Send (RTS) frames to a specific receiving station and negotiates the transmission of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. The RTS Threshold value should remain at its default value of 2347; user can select other value in range between 1 and 2347.

Wi-Fi Multimedia (WMM):
This feature maintains priority between different traffic types such as audio, video, voice and background traffic. This is done using QOS WMM feature which in turn increases throughput. The user has option available to disable it through toggle button but again will impact throughput rates.

WMM Power Save:
This feature helps client devices to conserve battery life. By default, it is enabled and it's recommended to leave it enabled.

7.3.1.1 Band Steering Settings

Band Steering detects clients capable of 5GHz operation and steers them to that frequency which leaves the often crowded 2.4GHz band available for legacy clients. This helps improve end user experience by reducing channel utilization, especially in high density environments. Band steering can ensure that they achieve their maximum performance without being bottlenecked by legacy 802.11b/g clients.

Band Steering is based upon the clients RSSI threshold value. A minimum threshold value is configured using the WebUI. When the threshold is reached, the clients are automatically steered.

The following screen provides the setup for Band Steering feature:

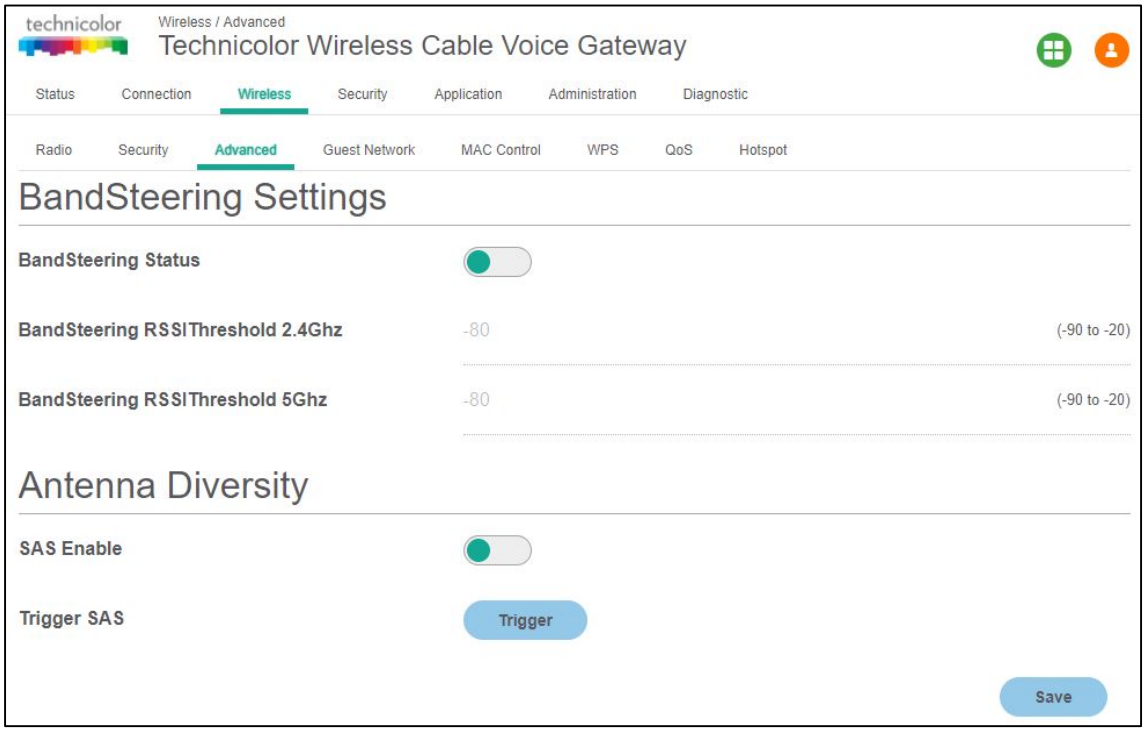


Figure 7.7

Here are the steps to configure Band Steering from the WebUI:

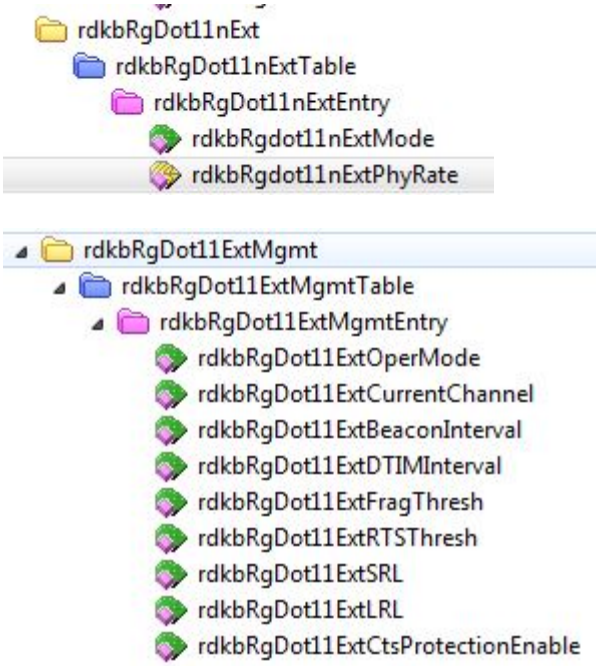
- Go to Wireless / Advanced Tab and enable the Band Steering Status button.
- Set the RSSI Threshold values for 2.4GHz and 5GHz to the desired values (Valid values are from -20 dBm to -90dBm, with a default value of -80 dBm. The values are greyed out when the feature is disabled).
- For the Band Steering feature to work, the Network Name should be same for both 2.4GHz and 5GHz primary SSIDs. User can configure the same in Wireless / Radio Tab. The security parameters for the 2.4GHz and 5GHz for this network should also be same. User can set the same in Wireless / Security Tab.

Note: Do not forget to hit the Save button after all changes are made.

7.3.2 SNMP provisioning for Advanced Wireless Setting

S. No.	MIBs	Description
1	**rdkbRgdot11nExtPhyRate**	**rdkbRgdot11nExtPhyRate**sets the transmission rate.
2	**rdkbRgdot11ExtCtsProtectionEnable**	**rdkbRgdot11ExtCtsProtectionEnable** sets the CTS protection mode.
3	**rdkbRgDot11ExtBeaconInterval**	**rdkbRgDot11ExtBeaconInterval**sets the beacon interval.
4	**rdkbRgDot11ExtDTIMInterval**	**rdkbRgDot11ExtDTIMInterval**sets the DTIM interval.

5	**rdkbRgDot11ExtFragThresh**	**rdkbRgDot11ExtFragThresh**sets the fragmentation threshold.
6	**rdkbRgDot11ExtWmm**	**rdkbRgDot11ExtWmm** enables or disables WMM.



7.4 Guest Network

This page displays Guest networks configuration. The user can configure Guest networks for both 2.4GHz and 5GHz radios. Users can set their own guest network SSID, Passphrase and DHCP address as well. Up to 7 guest SSIDs can be configured per radio.

Wireless Tab / Guest Network

Click on the Wireless tab then click on the Guest Networks tab. The page displays Guest Networks and Guest LAN Settings.

Guest Networks view shows names of all the guest networks configured, MAC address, Enable/Disable status and Broadcast SSID status for each one of them. The following figure provides that view:

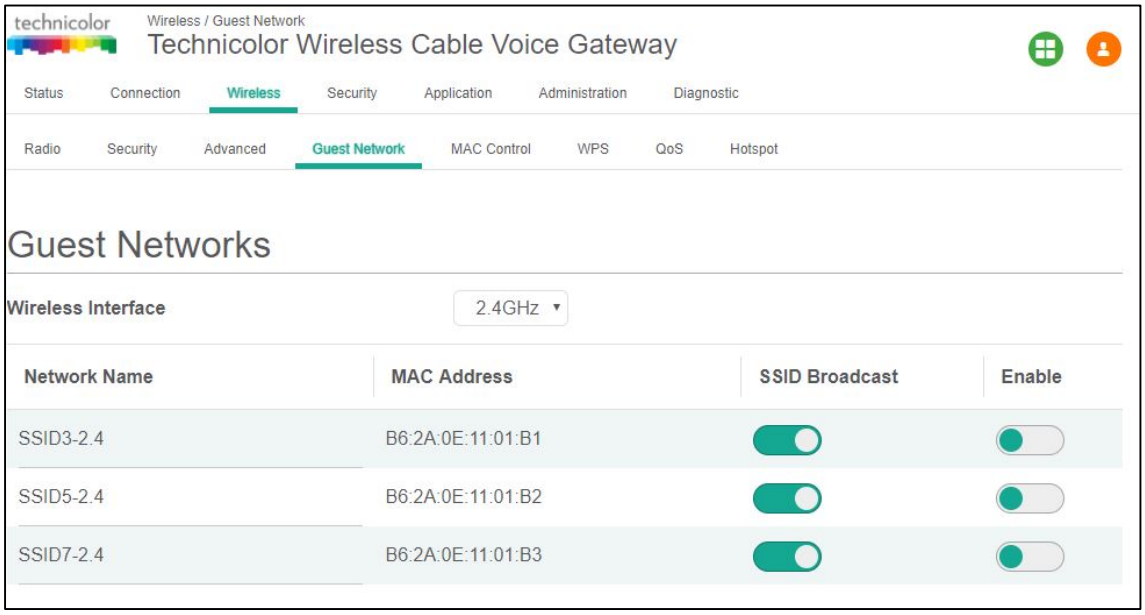


Figure 7.8

The Guest LAN view provides the configuration of a guest network. The network name, security mode, number of guests allowed in the network, IP address and DHCP configurations.

User can select the specific network name to view the configuration of that network. The figure below provides Guest LAN Settings view:

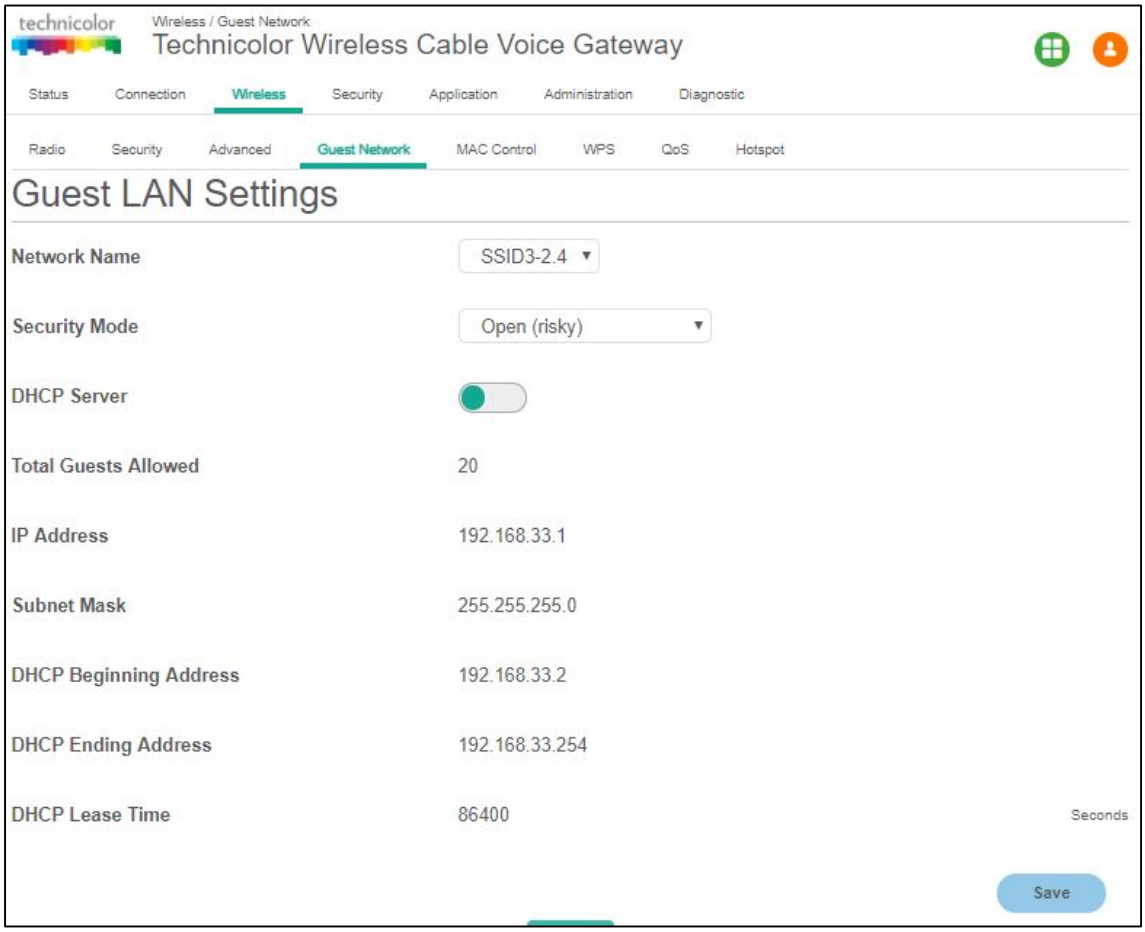


Figure 7.9

7.4.1 User provisioning for Guest Network

The user can configure the properties of a guest network (Network Name, SSID Broadcast status and enabling and disabling of the guest network) and the LAN configuration for each of the guest networks.

7.4.1.1 Guest Network

Wireless Interface:
This tab allows the user to select the wireless interface of the guest network (2.4GHz or 5GHz).

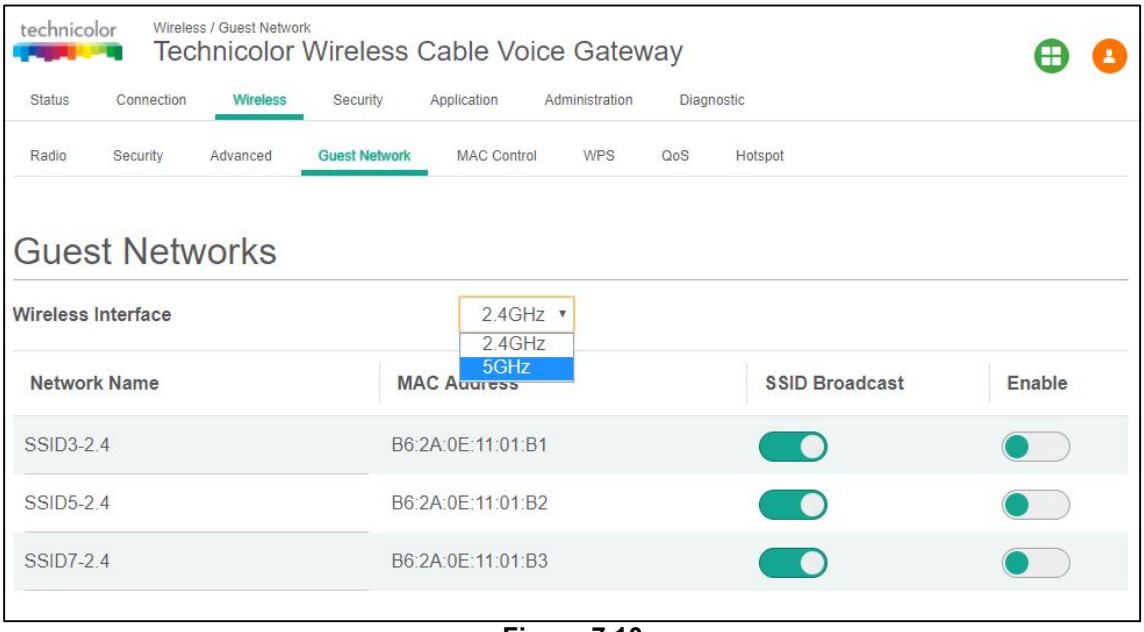


Figure 7.10

Network Name:
The Network Name shown here is the Guest Network name and different from the Network Name on the previous “Radio” tab. The user can change the default “SSID3- 2.4” to the desired value.

MAC Address:
The MAC address of the wireless interface is displayed in this field.

SSID Broadcast:
User can enable or disable this feature by the toggle button provided under SSID Broadcast; this is similar to Network Name “Hide” feature on the Radio tab in that it prevents the SSID from being broadcast.

Enable:
The user can enable or disable the Guest SSID by this toggle button.

7.4.1.2 Guest LAN Settings

Network Name:
SSIDs corresponding to the Wireless Interface selection are shown here.

Security Mode:
Please refer to 7.2.1 Security tab; settings are same. The user can select Security Mode, Encryption and the Network Password.

DHCP Server:
When enabled, the CGA4131 automatically assigns IP addresses. If disabled, parameters can be configured manually.

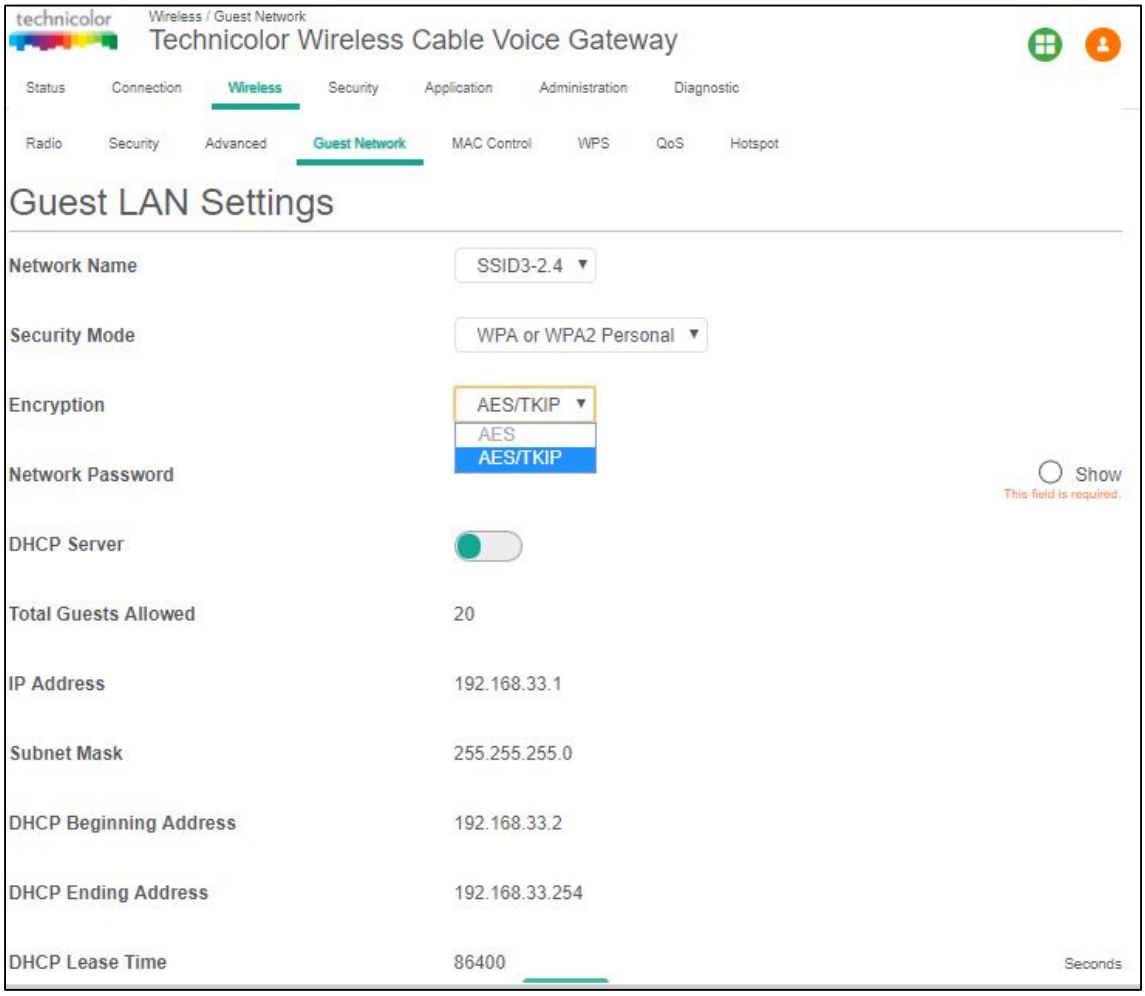


Figure 7.11

Note: Do not forget to hit the Save button after all changes are made.

7.4.2 SNMP provisioning for Guest Network

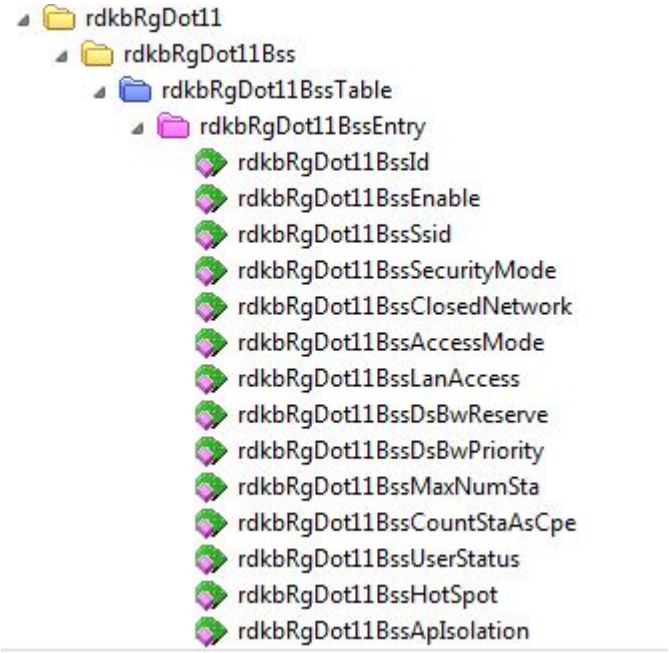
The following MIBs are used for provisioning the Guest Network:

S. No.	MIBs	Description
1	**rdkbRgDot11BssId**	Returns the BSSID
2	**rdkbRgDot11BssEnable**	Controls the BSS state.
3	**rdkbRgDot11BssSsid**	Controls and reflects the service set identifier.
4	**rdkbRgDot11BssSecurityMode**	Security for BSS.

5	**rdkbRgDot11BssClosedNetwork**	Controls whether the device will operate in closed network mode.
6	**rdkbRgDot11BssAccessMode**	Controls what stations will be given access to the device.
7	**rdkbRgDot11BssMaxNumSta**	This object defines the maximum number of STAs that can connect to this SSID. Note that the maximum number of STA across all SSIDs in the AP is 128. Default value is 128 for all SSIDs.
8	**rdkbRgDot11BssCountStaAsCpe**	This setting is used to control counting STAs in Max-Count of CPEs.
9	**rdkbRgDot11BssUserStatus**	Provides the BSS Id Web UI or Wireless ON/OFF (if exist) status that is set by the user.
10	**rdkbRgDot11BssHotSpot**	Determines/Sets whether this BSS is a Hotspot BSS. This allows the MSO to specify which BSS is configured for Hotspot Operation.
11	**rdkbRgDot11BssApIsolation**	AP Isolation (Access Point Isolation) allows isolating traffic between CPEs on the same Wi-Fi SSID.

The following MIBS determine how many user controlled and admin controlled Guest Wi-Fi can be configured and displayed in GUI:

S. No.	MIBs	Description
1	**rdkbRgDot11ExtMbssUserControl**	Sets the number of user controlled guest networks via Web UI
2	**rdkbRgDot11ExtMbssUseNonvol**	Allows to save additional BSS parameters to non-vol if set to TRUE
3	**rdkbRgDot11ExtMbssAdminControl**	Sets the number of admin controlled guest networks via Web UI


rdkbRgDot11
rdkbRgDot11Bss
rdkbRgDot11BssTable
rdkbRgDot11BssEntry
rdkbRgDot11BssId
rdkbRgDot11BssEnable
rdkbRgDot11BssSsid
rdkbRgDot11BssSecurityMode
rdkbRgDot11BssClosedNetwork
rdkbRgDot11BssAccessMode
rdkbRgDot11BssLanAccess
rdkbRgDot11BssDsBwReserve
rdkbRgDot11BssDsBwPriority
rdkbRgDot11BssMaxNumSta
rdkbRgDot11BssCountStaAsCpe
rdkbRgDot11BssUserStatus
rdkbRgDot11BssHotSpot
rdkbRgDot11BssApIsolation

7.5 MAC Control

Wireless access can be filtered by using the MAC addresses of the clients that are connected to Wi-Fi.

Wireless Tab / MAC Control

Click on the Wireless tab then click on MAC Control tab. The page displays MAC Control setup information. Here the user can set and display Network Name, Wi-Fi MAC Control, Access Restriction, MAC Control List (Device Name, MAC Address, Delete), Auto Learned Device (Device Name, MAC Address, IP Address, Status, Add).

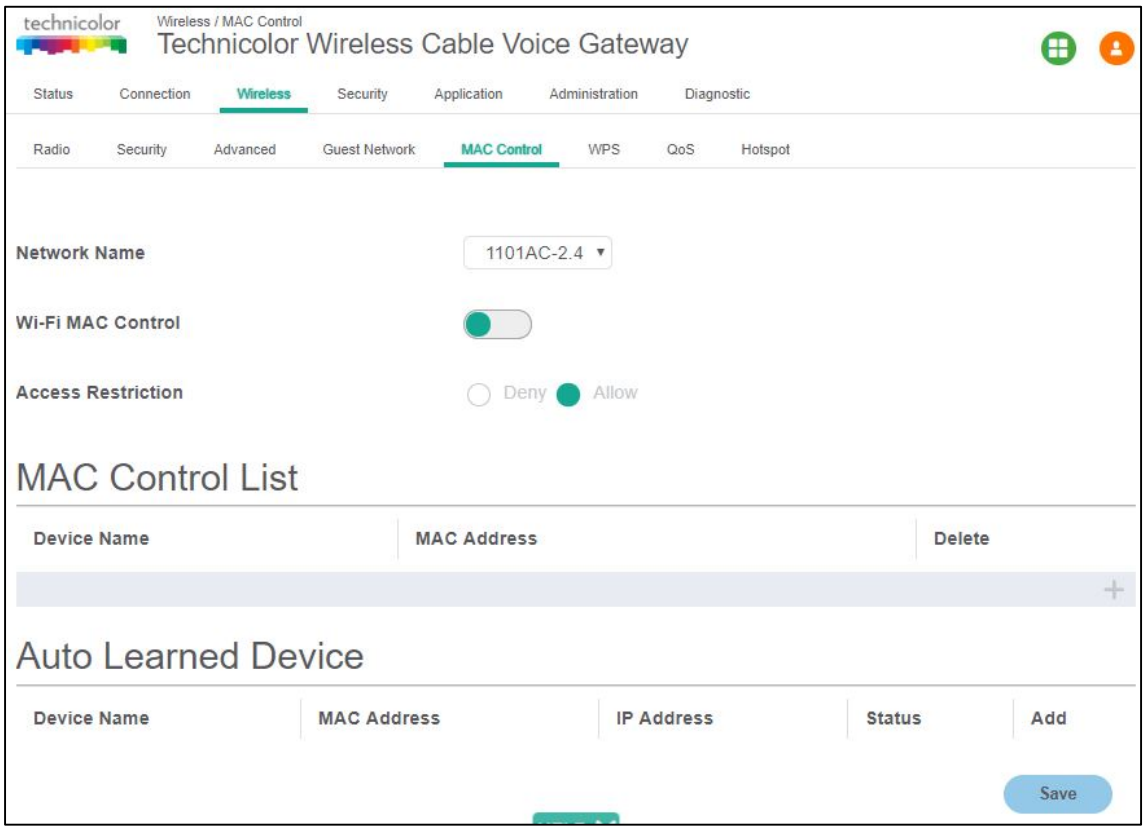


Figure 7.12

7.5.1 User provisioning for MAC Control

7.5.1.1 Network Name

Network name can be selected from the Drop down menu.

7.5.1.2 Wi-Fi MAC Control

Wi-Fi MAC Control can be enabled by the selection Wi-Fi MAC Control option.

7.5.1.3 Access Restrictions

Select the Deny or Allow button to block or permit the MAC addresses listed to access the wireless network.

7.5.1.4 MAC Control List

The gateway can manage the network access of select client devices if they are entered in this list using that device's MAC address.

Click the Add button to add to the list. Add the required details in the entries and click Save to add them into the control list.

7.5.1.5 Auto Learned Device

Auto learned devices are the Wi-Fi clients that are discovered by the gateway. The user can add them to the MAC control list by selecting the add option in the screen.

7.5.2 SNMP provisioning for MAC Control

rdkbRgDot11BssAccessModeenables/disables MAC Filter and specifies the access restriction mode.

S. No.	MIBs	Description
1	**rdkbRgDot11BssAccessMode**	Controls what stations will be given access to the device. If set to allowAny (0), then any station will be allowed to connect. If set to allowList (1), then only stations whose MAC address appears in the rdkbRgDot11AccessMacTable will be allowed to connect. The value for primary BSS is stored in non-vol. The default value for other BSSs is 0

7.6 WPS

Wi-Fi Protected Setup (previously called Wi-Fi Simple Config) is an optional certification program developed by the Wi-Fi Alliance designed to ease set up of security-enabled Wi-Fi networks at home and small office environments. Wi-Fi Protected Setup supports simple methods (by either pushing a button or entering a PIN into a wizard-type application) to pair a client and gateway.

The main aim of this protocol is to make gateway and client device connectivity easy for users who have very little knowledge of setting Wi-Fi security parameters, are tired of entering existing long passphrases and browser-less gaming clients where there is no option to enter a passphrase.

Wi-Fi Protected Setup (WPS) facilities users to easily connect to the wireless network by simply pushing a button or entering a PIN code. WPS permits home users to easily connect to a secure network without any complex configuration and eliminates the need to remember or store their security information in an unsafe way.

There are 3 ways to use WPS:

1. Push-Button Configuration (PBC) method:

In this, the user has to push a button, either an actual or a virtual one, on both the access point and the new wireless client device. Support of this mode is mandatory for access points and optional for connecting devices. The Wi-Fi Direct specification supersedes this requirement by stating that all devices must support the push button.

The Technicolor CGA4131 TCH2-GA-TBRprovides two WPS PBC buttons;
(1) HW button on the front panel
(2) SW button on the WebUI, as shown right.

Pressing either HW or SW PBC button will flash the WPS LED and perform the WPS PBC operation. Then, press the SW PBC button in the client device software (or a HW button in some devices). These buttons must be pushed within 60 seconds of each other.

2. Personal Identification Number (PIN) method:

This method is the mandatory baseline mode and every device must support it. The Wi-Fi Direct specification supersedes this requirement by stating that all devices with a keypad or display must support the PIN method

Enter the client device's PIN number here and click the Register button. If the WPS LED on the front panel flashes, press the start button in the client device software. If the client device software asks the target SSID, enter the current SSID shown on the WebUI. If a wrong PIN number was input, the client device will not be connected.

3. External Registrar (ER) method:

If the client device software supports the ER method, enter the gateway's SSID and PIN number in the client device software, and then press the start button. In this method, no action is required, and the WPS LED on the front panel will start to blink automatically. When the gateway detects an attempt with an invalid PIN, it doubles the lockout time. If it detects 10 attempted with invalid PIN since booting, the ER method will be disabled permanently.

7.6.1 User provisioning for WPS

Wireless Tab / WPS

Click on the Wireless tab and then click on the WPS control tab. The page displays WPS setup information. Here user can set and display WPS parameters including the Access Point PIN and Connection Method (Push Button/ PIN Number).

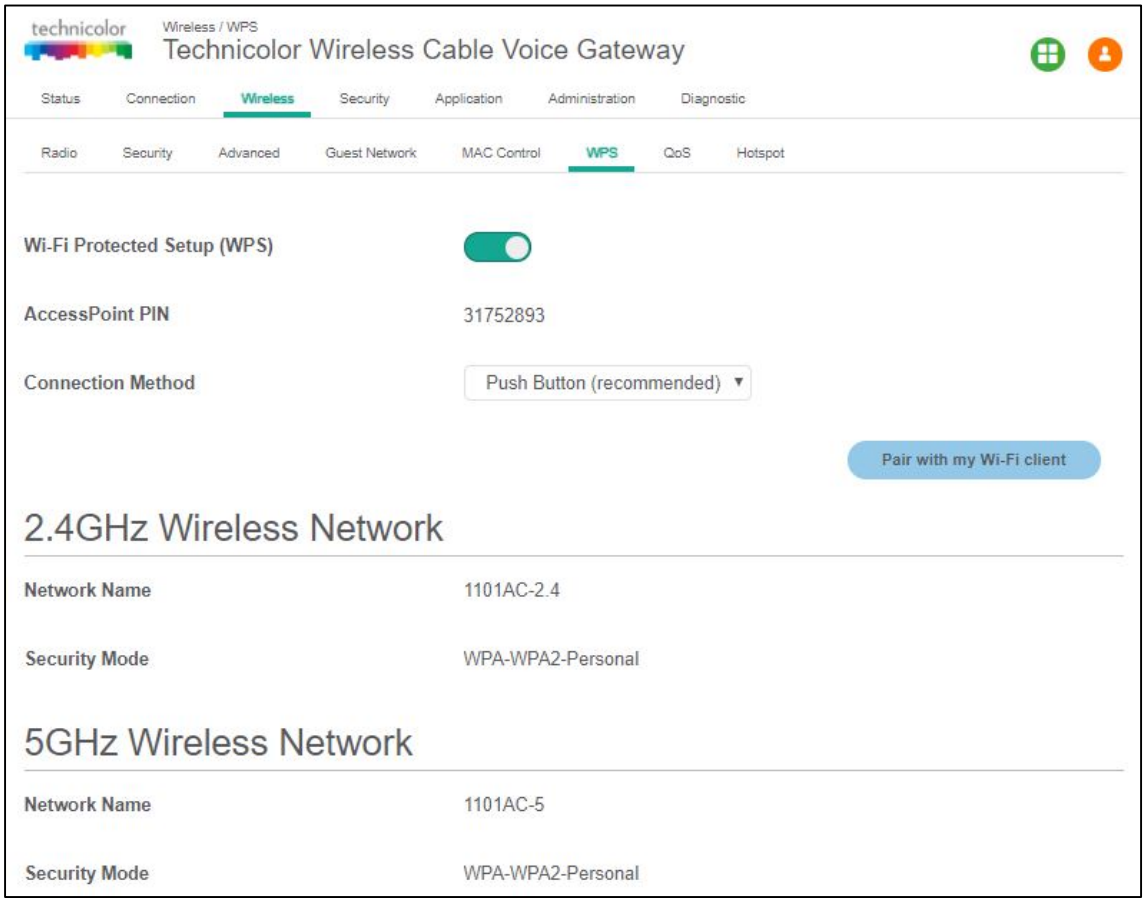


Figure 7.13

7.7 QoS

By default, networks operate on a best-effort delivery basis, which means that all traffic has equal priority and an equal chance of being delivered in a timely manner. When congestion occurs, all traffic has an equal chance of being dropped. Implementing QoS in wireless LAN makes network performance more predictable and bandwidth utilization more effective.

Note: When QoS is enabled, the device uses Wi-Fi Multimedia (WMM) mode by default.

Wireless Tab / QoS

Click on the Wireless tab then click on the QOS tab. The page displays QoS setup information. Here, the user can set and display SSID Index, Radio Band, Network Name, Wi-Fi Multimedia (WMM), WMM Power Save, Preset QoS Level (Low, Medium and High),Index, IcAifsn, IcEcwMin,IcEcwMax,IcTxOp, IcAckPolicy.

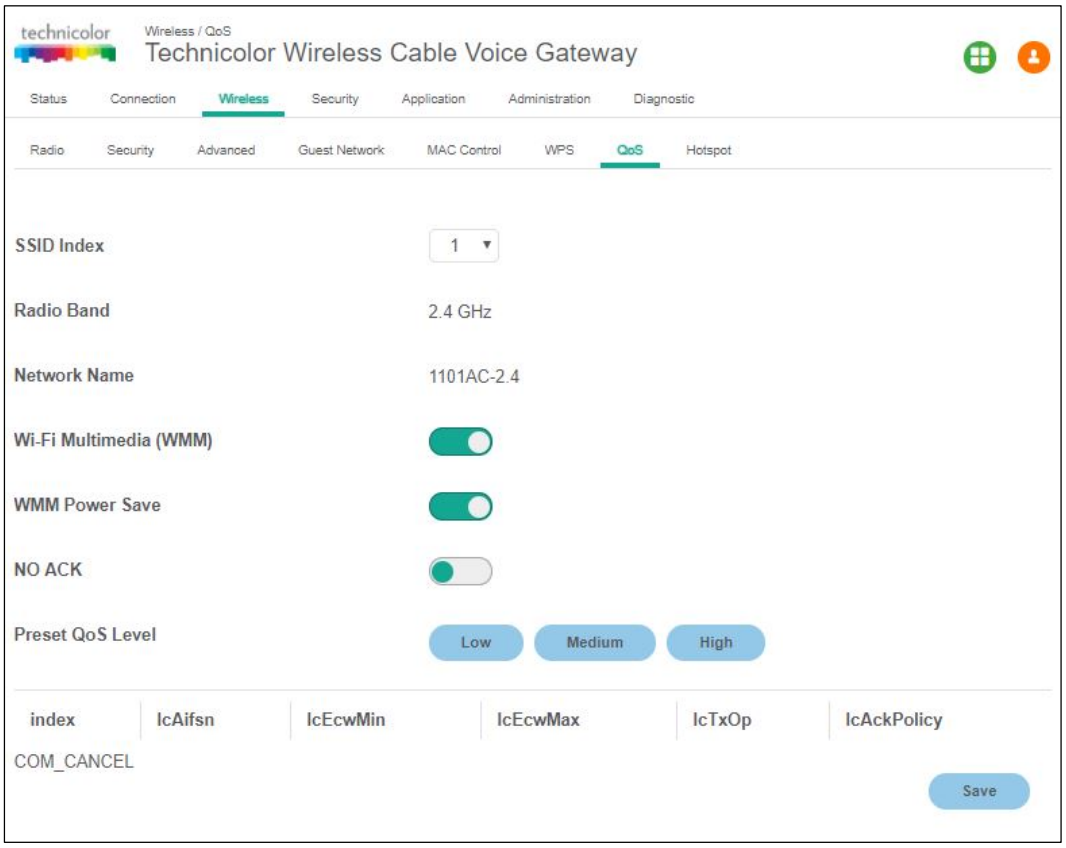


Figure 7.14

7.7.1 User provisioning for QOS

SSID Index:
The user can select any number from the drop down list, where 1 represents 2.4GHz and 2 represents 5GHz.Other numbers will be assigned to the Guest SSIDs, if applicable.

Radio Band:
This tab only displays which Wireless band is selected, dependent on the selection of SSID Index.

Network Name:
The network name of the selected SSID index is shown.

Wi- Fi Multimedia and WMM Power Save:
Please refer to section 7.3.1for definitions.

Note: It's recommended not to change anything under this tab; any incorrect settings can lead to degradation in wireless network performance.

7.7.2 SNMP provisioning for QoS

S. No.	MIBs	Description
1	**rdkbRgDot11ExtWmm**	**rdkbRgDot11ExtWmm**enables or disables WMM.
2	**rdkbRgDot11ExtWmmNoAck**	**rdkbRgDot11ExtWmmNoAck**enables or disables the no acknowledgement feature for WMM.

7.8 Hotspot

CGA4131 supports Wi-Fi hotspot functionality where secondary SSIDs can be configured as public access points.

CGA4131 must establish a connection to a remote endpoint over GRE. Traffic is routed to the GRE endpoint over routes established in the route table. When a data packet is received by the GRE endpoint, it is de-encapsulated and routed to its destination address.

Wireless Tab / Hotspot

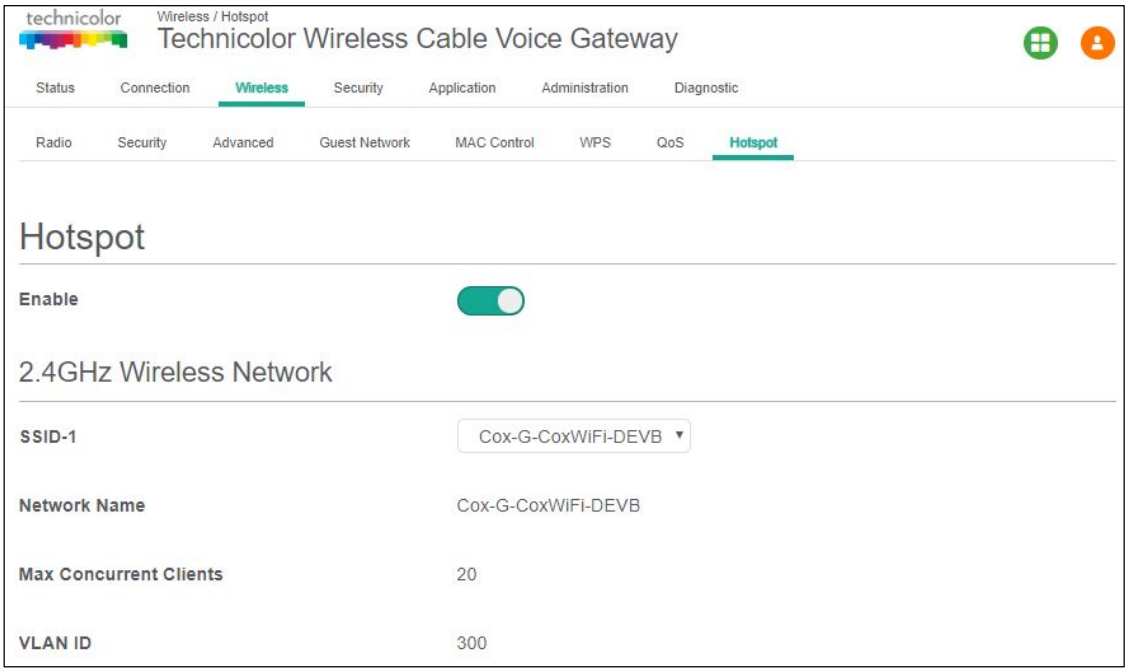


Figure 7.15

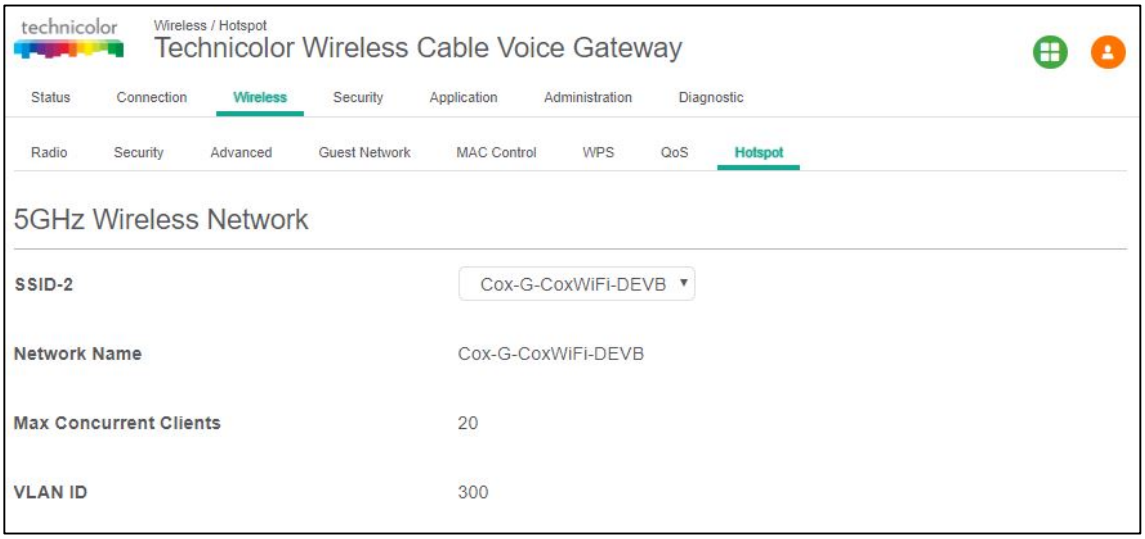

technicolor
Wireless / Hotspot
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Radio
Security
Advanced
Guest Network
MAC Control
WPS
QoS
Hotspot
5GHz Wireless Network
SSID-2
Cox-G-CoxWiFi-DEVB
Network Name
Cox-G-CoxWiFi-DEVB
Max Concurrent Clients
20
VLAN ID
300

Figure 7.16

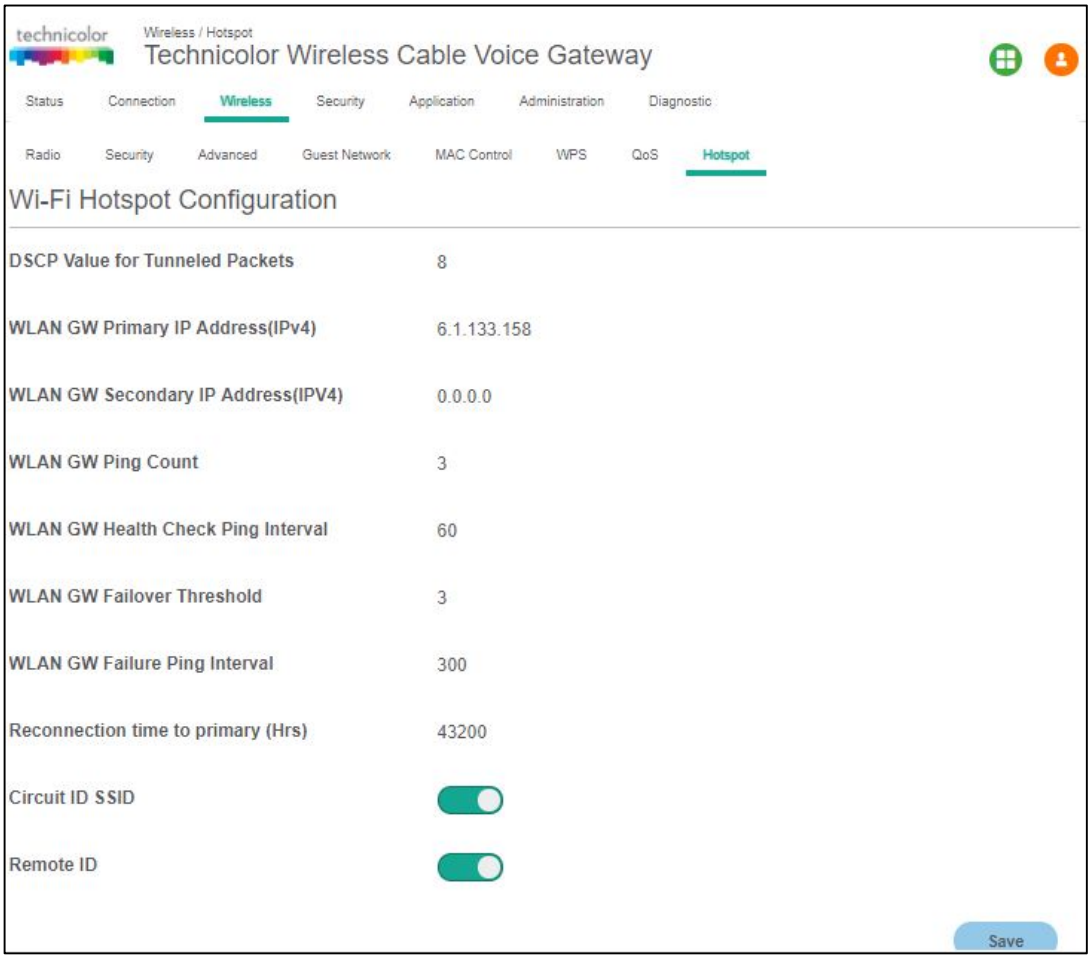


Figure 7.17

7.8.1 Enabling GRE hotspot with cable modem configuration file

CM Config file snippet for L2OGRE tunnel establishment

```
SnmpMibObject rdkbRgL2ogrePriRemoteAddressType.0 Integer 1; /* ipv4 */
SnmpMibObject rdkbRgL2ogrePriRemoteAddress.0 HexString 0xae44ea7e;
SnmpMibObject rdkbRgL2ogreKeepAliveMode.0 Integer 1; /* disabled */
SnmpMibObject rdkbRgL2ogreSourceIf.7 Integer 7; /* wifi1-6 */
SnmpMibObject rdkbRgL2ogreSourceIf.15 Integer 15; /* wifi2-6 */
SnmpMibObject rdkbRgL2ogreSourceIfEnabled.7 Integer 1; /* true */
SnmpMibObject rdkbRgL2ogreSourceIfEnabled.15 Integer 1; /* true */
SnmpMibObject rdkbRgL2ogreSourceIfVlanTag.7 Integer 300;
SnmpMibObject rdkbRgL2ogreSourceIfVlanTag.15 Integer 300;
SnmpMibObject rdkbRgL2ogreSourceIfMplsHeader.7 Integer 0;
SnmpMibObject rdkbRgL2ogreSourceIfMplsHeader.15 Integer 0;
SnmpMibObject rdkbRgL2ogreSourceIfRowStatus.7 Integer 1; /* active */
SnmpMibObject rdkbRgL2ogreSourceIfRowStatus.15 Integer 1; /* active */
SnmpMibObject rdkbRgWifiHotspotEnabled.0 Integer 1; /* true */
```

```
SnmpMibObject rdkbRgL2ogreEnabled.0 Integer 1; /* true */
```

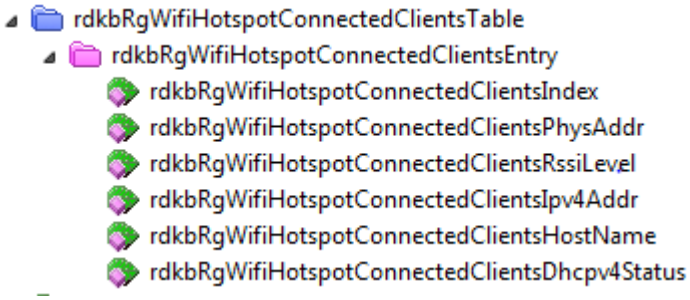
CM Config file snippet for Hotspot SSID configuration

```
SnmpMibObject rdkbRgDot11BssEnable.10008 Integer 1; /* enable */
SnmpMibObject rdkbRgDot11BssEnable.10108 Integer 1; /* enable */
SnmpMibObject rdkbRgDot11BssSsid.10008 String "TCH WiFi-DEV";
SnmpMibObject rdkbRgDot11BssSsid.10108 String "YCH WiFi-DEV";
SnmpMibObject rdkbRgDot11BssSecurityMode.10008 Integer 0; /* disabled */
SnmpMibObject rdkbRgDot11BssSecurityMode.10108 Integer 0; /* disabled */
SnmpMibObject rdkbRgDot11BssHotSpot.10008 Integer 1; /* true */
SnmpMibObject rdkbRgDot11BssHotSpot.10108 Integer 1; /* true */
SnmpMibObject rdkbRgDot11BssEntry.16.10008 Integer 1
SnmpMibObject rdkbRgDot11BssEntry.16.10108 Integer 1;
```

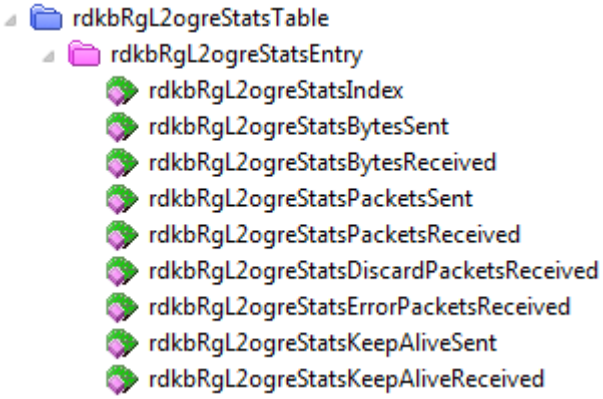
After the unit comes online with Opt-in hotspot configuration, client devices can be connected to the hotspot SSID and can access the internet. Clients will be assigned IP address by the tunnel endpoint. Separate service flow is created for hotspot traffic to isolate traffic from private local network.

7.8.2 SNMP provisioning for Hotspot

Hotspot feature is configured using the following MIB elements. An entry defining the Wi-Fi hotspot connected clients:



This table provides statistical information of GRE tunnel:



8 Security

Security settings within the CGA4131 TCH2-GA-TBR's page allow blocking or selectively allowing different types of data through the router from the WAN to the LAN. Additionally, the settings allow the device's firewall to be enabled or disabled. The following security settings are provided:

- Java Applets, Cookies, ActiveX controls, Popup Windows, and Proxies can be blocked using this page. Firewall Protection turns on the Stateful Packet Inspection (SPI) firewall features.
- Block Fragmented IP packets prevents all fragmented IP packets from passing through the firewall.
- Port Scan Detection detects and blocks port scan activity originating on both the LAN and WAN.
- IP Flood Detection detects and blocks packet floods originating on both the LAN and WAN.

Click the Apply button to activate any of the checkbox items. These settings can be activated without a device reboot.

8.1 Firewall

Security Tab / Firewall
Use the Firewall screen to configure a firewall that can filter out various types of unwanted traffic on the gateway local network.

Procedure
Click on the Security tab, and then click on Firewall tab. The page displays Firewall setup information. Here user can set and display the following:

IPv4 Firewall: Firewall Security Level, LAN – to – WAN, WAN – to – LAN

IPv6 Firewall: IPv6 Firewall Security Level, LAN – to – WAN, WAN – to – LAN

Advanced Settings: IPSec Passthrough, PPTP Passthrough, Block Fragmented IP Packets, IP Flood Detection.

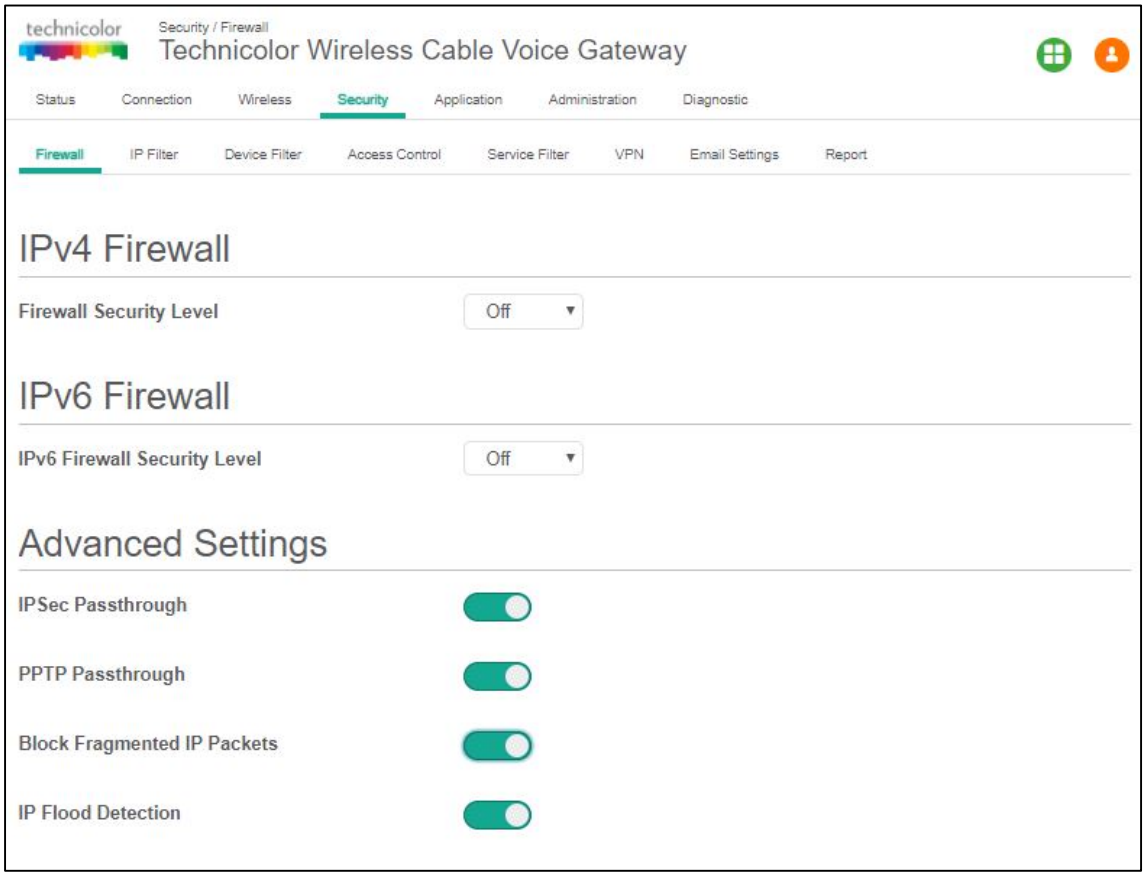


Figure 8.1

The following table explains the traffic restrictions while setting the firewall level to various levels – High, Medium, Low and Off.

Firewall level	Restrictions on inbound traffic	Restrictions on outbound traffic	Remarks
High	All unsolicited inbound traffic is blocked, and Intrusion Detection is enabled.	All traffic except the following are restricted: • HTTP and HTTPS (TCP ports 80, 443) • DNS (TCP/UDP port 53) • NTP (UDP ports 119, 123) • Email (TCP ports 25, 110, 143, 465, 587, 993, 995) • VPN (GRE, UDP port 500, TCP port 1723) • iTunes (TCP port 3689)	Both inbound and outbound traffic are restricted
Medium	Inbound traffic is blocked for the following services:	No restrictions - Outbound connections are allowed by the firewall regardless of the	

	• IDENT protocol (TCP port 113) • ICMP request • Peer-to-Peer applications • Kazaa (TCP/UDP port 1214) • BitTorrent (TCP ports 6881-6999) • Gnutella (TCP/UDP port 6346) • Vuze (TCP ports 49152-65534) Intrusion Detection is enabled in the Medium operating level. All other inbound traffic is allowed by the firewall. Please note that unsolicited inbound traffic will not be forwarded to devices on home network unless they match a port forwarding / triggering rule, or a DMZ host has been configured.	service or port(s) being used for the connection.	
Low	Inbound traffic is blocked for the following services: • IDENT protocol (TCP port 113) Intrusion Detection is enabled in the Low operating level. All other inbound traffic is allowed by the firewall. Please note that unsolicited inbound traffic will not be forwarded to devices on home network unless they match a port forwarding / triggering rule, or a DMZ host has been configured.	No restrictions - outbound connections are allowed by the firewall regardless of the service or port(s) being used for the connection.	
Off	No restrictions. Can be enabled through port forward/ port trigger/DMZ rule	No restrictions	Firewall configuration is disabled.

8.1.1 User provisioning for Firewall

The following screens provide a view on the various configurations for IPv4 and IPv6 firewalls supported:

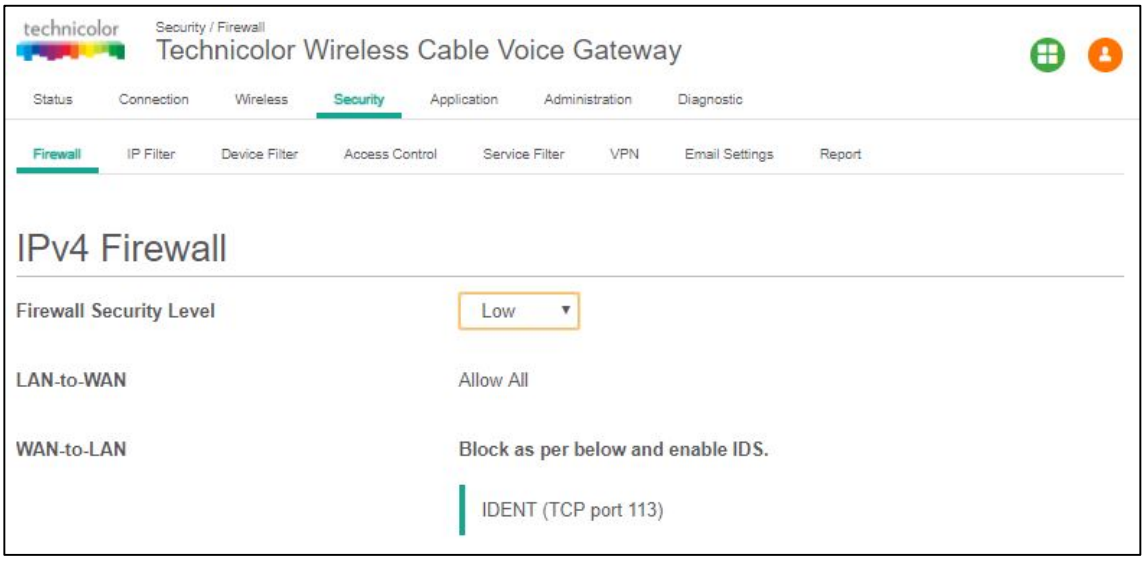


Figure 8.2

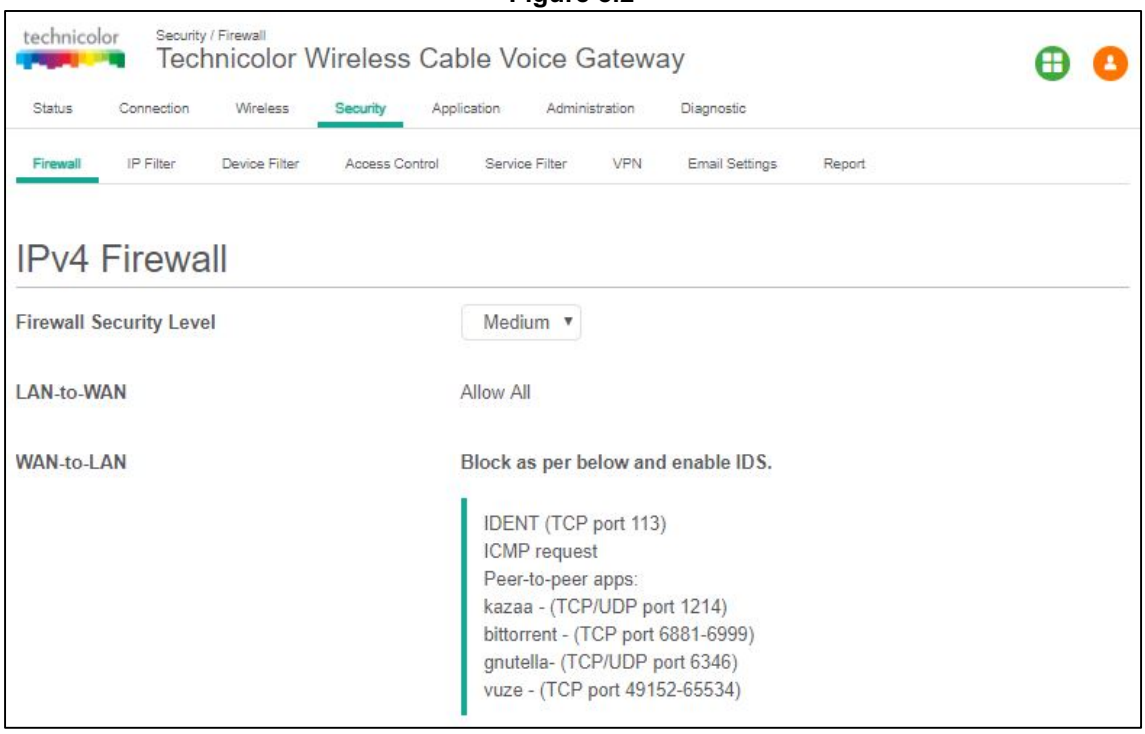


Figure 8.3

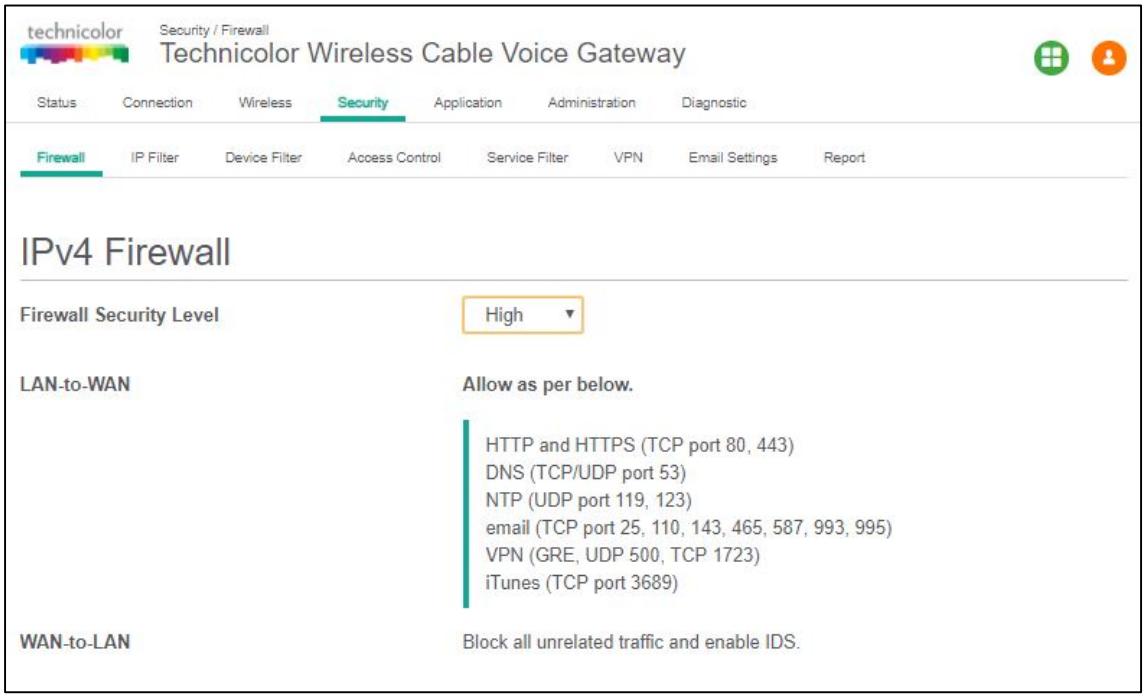


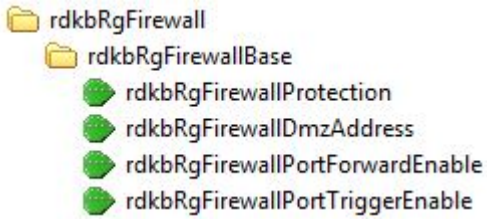
Figure 8.4

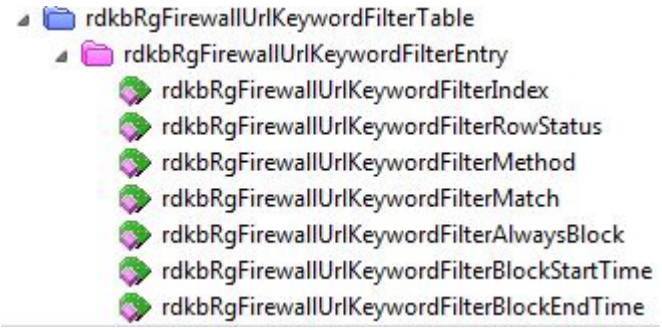
Similar configurations can be done for the IPv6 firewalls in the system. By default, the firewall configuration is set to “Off”.

8.1.2 SNMP provisioning for Firewall

SNMP provisioning is done by the following MIBs for Firewall Basic settings

S. No.	MIBs	Description
1	**rdkbRgFirewallProtection**	Controls the firewall. This parameter is stored in non-vol and is enabled after factory reset. Options are Disable / Low, Medium, High and Custom.





8.2 IP Filter

IP filter functionality is used to block internet access for the clients with the IP address range selected in the Web UI.

8.2.1 User provisioning for IP Filter

To activate the IP address filter, provide the IP address range, click Enable and then click Save Settings.

Security Tab / IP Filter
This page displays IP Filter Table information. Here, user can set and display Start Address, End Address, Enable and Delete for IP Filtering.

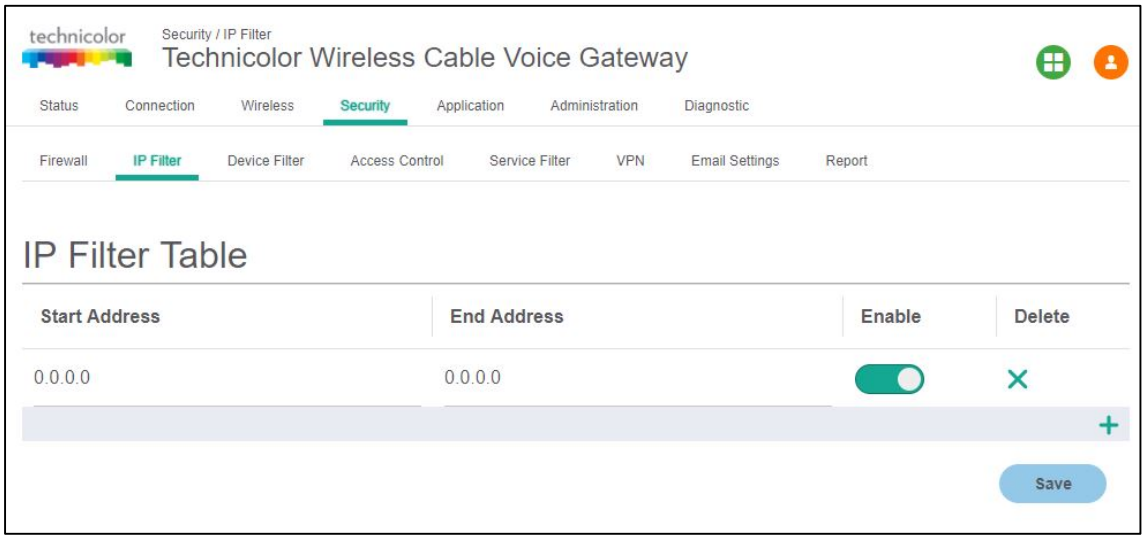


Figure 8.5

8.3 Device Filter

The Device Filter page is used to allow or block devices connecting to the router, for both LAN and Wi-Fi clients. The devices are allowed or blocked with respect to their MAC

address, which is added in the allowed devices list in this page. User can add devices through auto learnt devices under the device list or add a device manually under the Allowed Devices list.

Security Tab / Device Filter
Click on the Security tab then click on Device Filter tab. The page displays following Device Filter setup information:

- Device Filter Status - (Enabled / Disabled)
- Access Type - (Allow All / Block All)
- Blocked Devices List - (Computer Name, MAC Address, When Block, and Delete)
- Devices List–List of auto learnt devices (Computer Name, MAC Address, Status, and Operation)

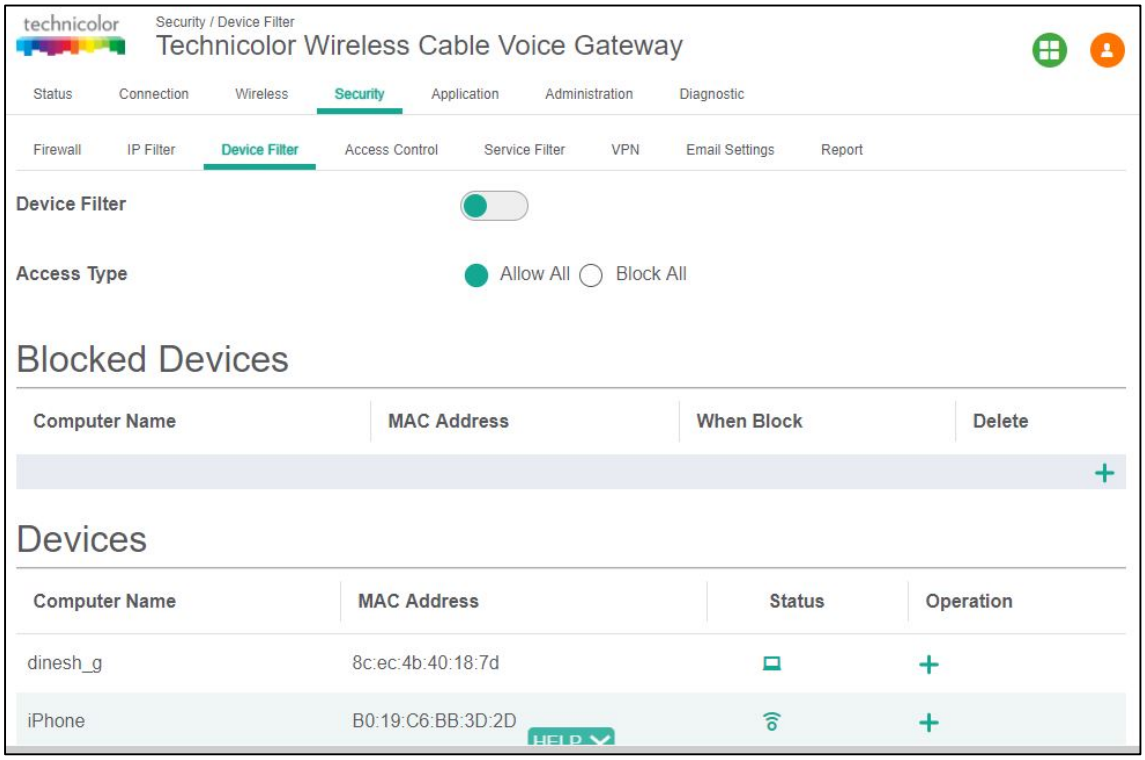


Figure 8.6

8.3.1 User provisioning of Device Filter

User provisioning involves enabling or disabling the feature (using Device Filter option), selecting the filter type (Allow all or Deny All) and adding the devices into the Blocked List.

Enable Device Filter
Device Filter can be enabled with Access type either Block All devices or Allow All devices status. Filter can be enabled by clicking on the corresponding button.

Block All
When Block All option is selected, all devices except in the Allowed Devices would be blocked for internet access.

Allow All
When Allow All option is selected, all devices except in the Blocked Devices would be allowed for internet access.

Options for time of the day filters – When Block
When the user configures the "When Block" option to select the day of the week and the time of the day, the device filter would be activated only for the selected time of the day option.

8.3.2 SNMP provisioning for Device Filter

SNMP provisioning is done by the following MIBs for Device Filter:

S. No.	MIBs	Description
1	**rdkbRgFirewallMacFilterEnable**	True = Enable the Mac address filtering feature. False = disable. This Value is written to non-vol and set to false after a factory reset.
2	**rdkbRgFirewallMacFilterMode**	Block (0) - Macs listed in the rdkbRgFirewallMacFilterEntryTable will be blocked. Permit (1) - Macs listed in the rdkbRgFirewallMacFilterEntryTable will be permitted. This value is written to non-vol and is set to block (0) after a factory reset.

8.4 Access Control

The Access Control page is used to block websites based on their URL. User can add the desired website under the Blocked sites and the added website will be blocked for both LAN and WLAN devices, which are connected through the router.

Security Tab / Access Control
Click on the Security tab then click on Access Control tab.

This page displays following Site Filter setup information which can be viewed and set by user:

- Site Filter Status: (Enabled / Disabled)
- List of Blocked Sites: (with Content, Type, When, Delete information)
- Trusted Devices: List of devices auto leant in the gateway.(with Computer Name, MAC Address, IP Address, Trusted information)

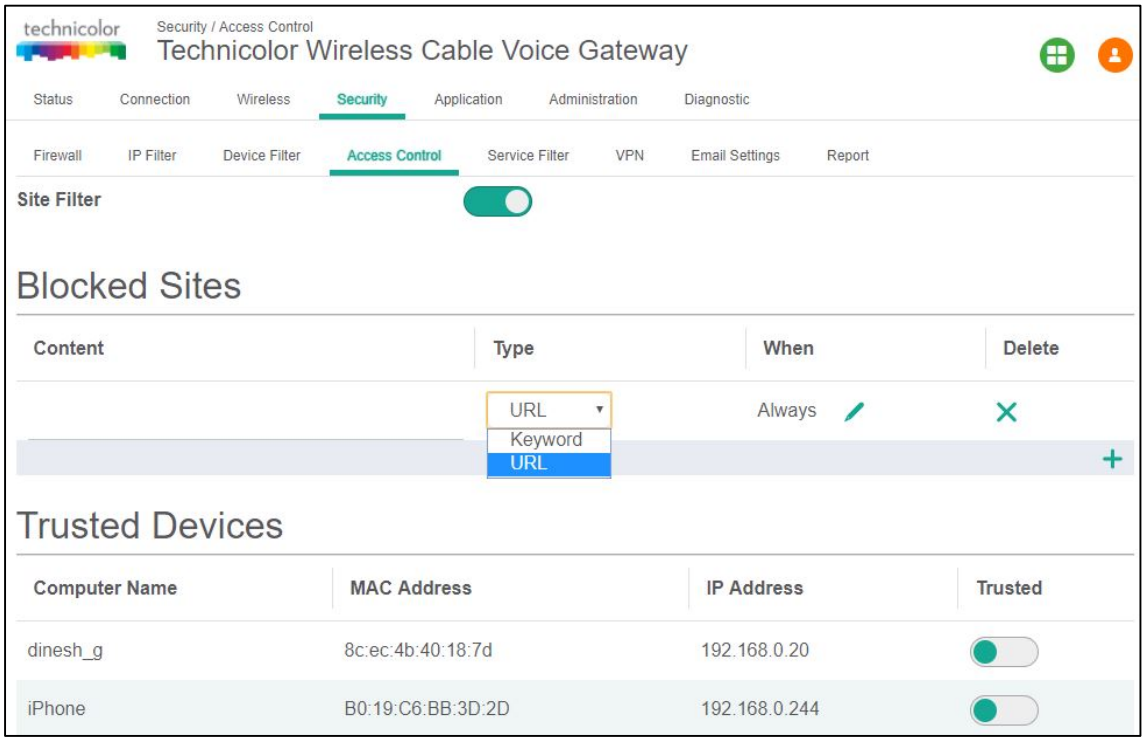


Figure 8.7

8.4.1 User provisioning for Access Control

User provisioning involves enabling or disabling the Access control feature using Site Filter option.

Blocked Sites
The user needs to create the Blocked Sites by adding the URL details, type, and time of the day for the filter to be enabled to the list. There is an option to delete the URLs from the Blocked Sites list.

Trusted Devices
The user can override this feature for specific devices. They need to be added in the Trusted Devices list with Trusted button enabled.

8.4.2 SNMP provisioning for Access Control

The following MIBs configure the Access Control feature:

S. No.	MIBs	Description
1	**rdkbRgFirewallUrlKeywordFilterEnable**	True = Enable the URL Keyword filtering feature. False = Disable.
2	**rdkbRgFirewallUrlKeywordFilterRowStatus**	The row status. A row can be destroyed. If the row is not used, set to notInService
3	**rdkbRgFirewallUrlKeywordFilterMethod**	URLs or specific words according to Method set
4	**rdkbRgFirewallUrlKeywordFilterMatch**	URLs or specific words according to Method set
5	**rdkbRgFirewallUrlKeywordFilterAlwaysBlock**	If true (1), always be blocked, regardless of startTime, endTime and blockDays. If false(2), blocked at time set in startTime, endTime and blockDays
6	**rdkbRgFirewallUrlKeywordFilterBlockStartTime**	24 Hour format HH:MM to set the start time to block
7	**rdkbRgFirewallUrlKeywordFilterBlockEndTime**	24 Hour format HH:MM to set the end time to block
8	**rdkbRgFirewallUrlKeywordFilterBlockDays**	BITMAP to indicate which days to block

8.5 Service Filter

The Service Filter page is used to block certain service requests coming from the LAN to WAN devices connected through the router. User can block the desired service port range by adding it to Blocked services

Security Tab / Service Filter
Click on Security tab then click on Service Filter tab. The page displays following Service Filter setup information, which can be viewed and modified by user.

- Service Filter (Enable / Disable)
- Blocked Services - The specific traffic / service that are blocked using the Service Filter. This could be protocols or port numbers - Services Name, TCP/UDP, Start Port, End Port, Time (When), and Delete
- Trusted Devices–List of auto leaned devices in the LAN. Service filter can be enabled or disabled for these devices by selecting the Trusted option.

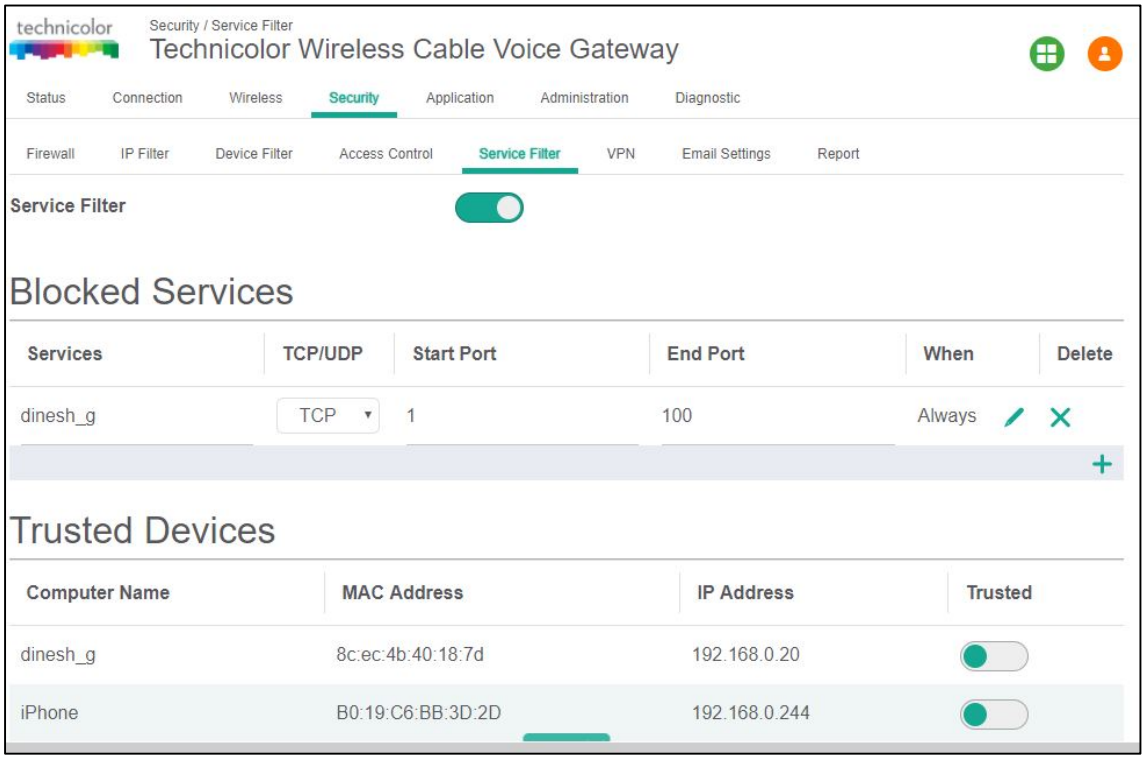


Figure 8.8

8.5.1 User provisioning for Service Filter

User can enable this feature by enabling the Service Filter option.

Blocked Services
The user needs to create the services list. This can be done by adding an entry and selecting the protocol and port information. The user needs to configure the time of the day configurations (option When) – the time when the filter should be enabled for the enabled devices.

Trusted Devices
The user needs to enable or disable the feature for the specific devices – this can be done by enabling the Trusted button in the Trusted Devices list. If the Trusted button is enabled, the service filter is applied as per the service filter definitions (Protocol, Port Range and Time of the day).

8.5.2 SNMP provisioning for Service Filter

The following MIBs configure the Service Filter feature:

S. No.	MIBs	Description
1	**rdkbRgFirewallPortFilterEnable**	True = Enable the Port filtering feature. False = Disable.

8.6 VPN Tunnel Settings

This feature is used in cases where the gateway acts as the VPN endpoint and the user needs to make all the machines connected to the LAN side to be part of the enterprise private network. This is mainly used in B2B (Business-2-Business) applications.

For the CGA4131 TCH2-GA-TBRto act as a VPN endpoint, configurations can be done from the Security ->VPN page.

Enter the details of the local subnet and the remote subnet including the VPN gateway and security parameters for IPSEC (Key Exchange Method, Encryption, Authentication, Pre--shared key. etc.). Obtain these details from the network administrator (of the enterprise connecting to) before setting up the VPN tunnel.

Security Tab / VPN
Click on Security tab then click on VPN tab. The page displays VPN setup information. Here the user can set and display VPN information.

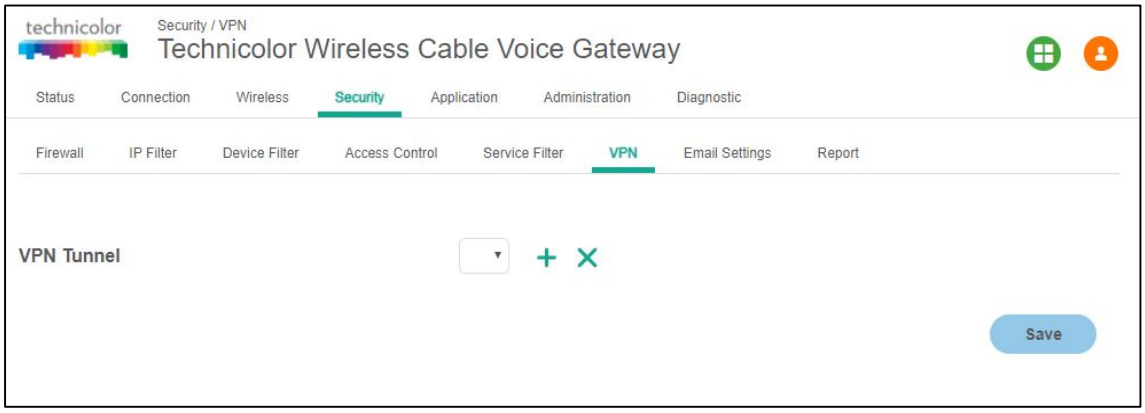


Figure 8.9

The user can configure the VPN Tunnel details by clicking on '+' symbol corresponding to the VPN Tunnel option. The page will show the following information:

- Enable (Option to enable VPN),
- Tunnel Name (Name of the tunnel to be created between endpoints)
- Local Secure Group: - (IP Address, Subnet Mask)
- Remote Secure Group: - (IP Address, Subnet Mask)
- Remote Secure Gateway: - (IP Address)
- Key Management: - (Key Exchange Method, Encryption Algorithm, Authentication

- Algorithm, Pre –Shared Key, Key Life Time)

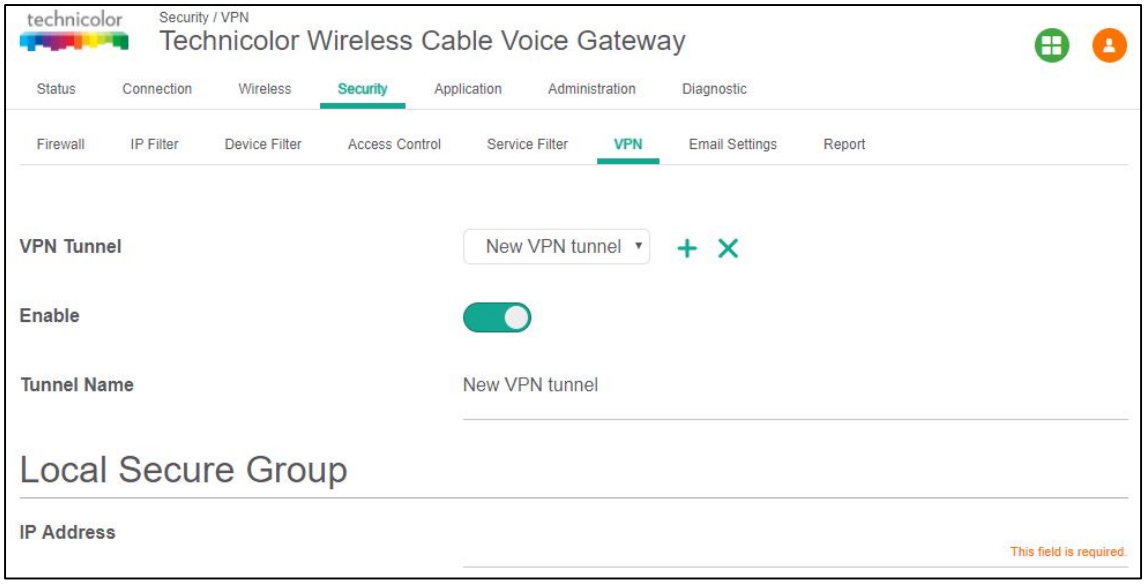


Figure 8.10

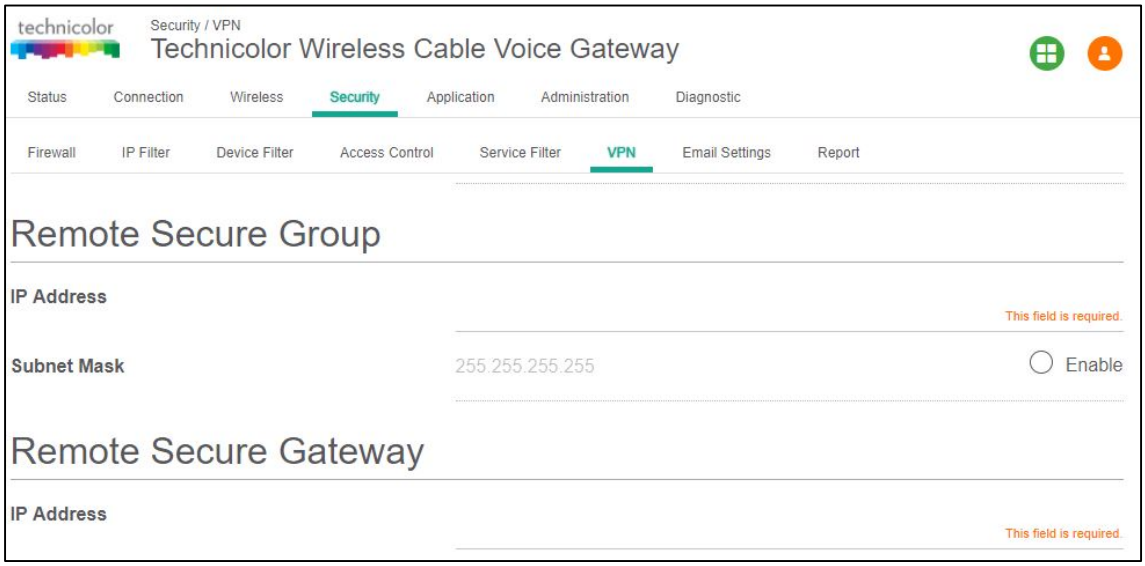


Figure 8.11

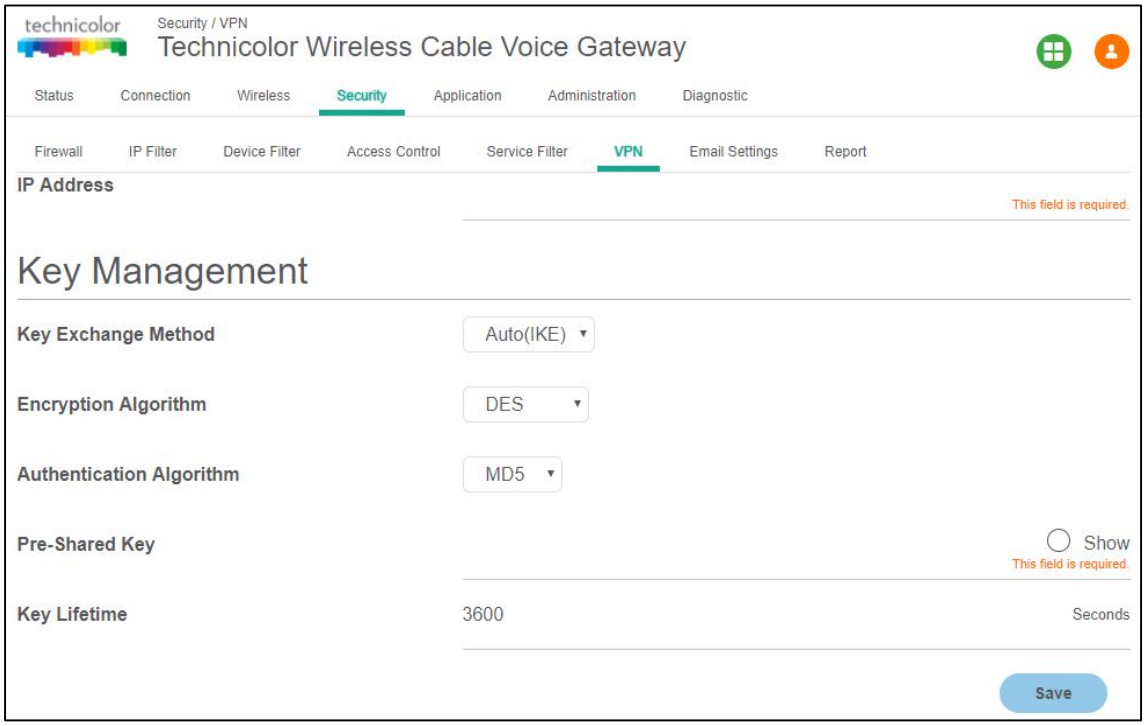


Figure 8.12

8.6.1 User provisioning for VPN

The following table explains the various parameters and possible configurations for each of the parameters to edit/create a VPN entry:

VPN Tunnel	**Select Tunnel Entry**: Select a tunnel to configure. **'+" Button**: Click this button to create a new tunnel. **'X' Button**: Click this button to delete all settings for the selected tunnel.
Enable	To Enable VPN Tunnel.
Tunnel Name:	Enter a name for this tunnel, such as London Office.
Local Secure Group	Select the local LAN user(s) that can use this VPN tunnel. This may be a single IP address or sub-network. Note that the Local Secure Group must match the remote gateway's Remote Secure Group. **IP Address**: Enter the IP address on the local network. **Subnet Mask**: If the Subnet option is selected, enter the mask to determine the IP Addresses on the local network.

Remote Secure Group	Select the remote LAN user(s) behind the remote gateway who can use this VPN tunnel. This may be a single IP address, a sub-network, or any addresses. If Any is set, the gateway acts as a responder and accepts requests from any remote user. Note that the Remote Secure Group must match the remote gateway's Local Secure Group. **IP Address:** Enter the IP address on the remote network. **Subnet Mask**: If the Subnet option is selected, enter the mask to determine the IP addresses on the remote network.
Remote Secure Gateway	Select the desired option, IP Address.
Key Management	**Key Exchange Method**: The device supports both automatic and manual key management. When automatic key management is selected, Internet Key Exchange (IKE) protocols are used to negotiate key material for Security Association (SA). If manual key management is selected, no key negotiation is needed. Manual key management is used in small static environments or for troubleshooting purposes. Note that both sides must use the same key management method. **Encryption Algorithm**: The Encryption method determines the length of the key used to Encrypt/decrypt ESP packets. Note that both sides must use the Same method. Available Options are DES, 3DES, AES-128, AES-129, AES-256 **Authentication Algorithm**: The Authentication method authenticates the Encapsulating Security Payload (ESP) packets. Select MD5 or SHA. Note that both sides (VPN Endpoints) must use the same method. **MD5**: A one-way hashing algorithm that produces a 128--bitdigests **SHA1:** A one-way hashing algorithm that produces a 160-bitdigests **Pre-Shared Key**: IKE uses the Pre-Shared Key to authenticate the remote IKE peer. Both character and hexadecimal values are acceptable in this field, e.g., My_@123 or 0x4d795f40313233. Note that both sides must use the same Pre-Shared Key. **Key Lifetime**: This field specifies the lifetime of the IKE generated key. If the time Expires, a new key will be renegotiated automatically. The Key

	Lifetime may range from 300 to 100,000,000 seconds. The default lifetime is 3600 seconds. **Enable**: To Enable the Key Management. **Tunnel Name:** This field specifies Tunnel Name.

The user needs to select the required values and options for the above parameters and press Save button on the Web UI page to save them.

8.7 Email settings

Security Tab / Email Settings

Click on Security tab then click on Email settings tab. The page displays Email settings information which can be viewed and modified by the user. The following information will be displayed:

- Recipient Email
- Notification Types - (Firewall Breach, Access Control Breach, Alerts or Warnings, Send Logs)
- Mail Server Configuration - (SMTP Server Address, Send Email Address, Username and Password)

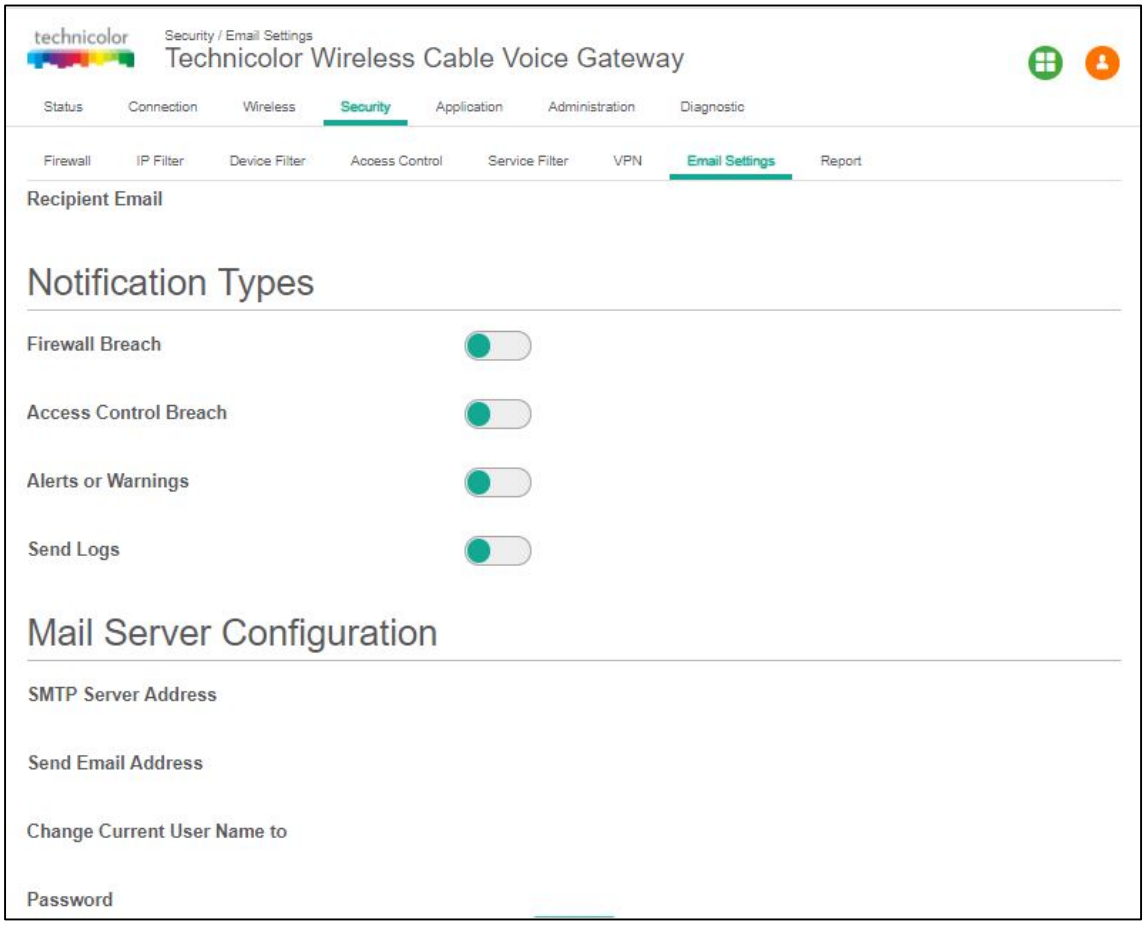


Figure 8.13

8.7.1 User provisioning for Email

The notification types needed is enabled using the options in the screen. By default, all notifications are disabled.

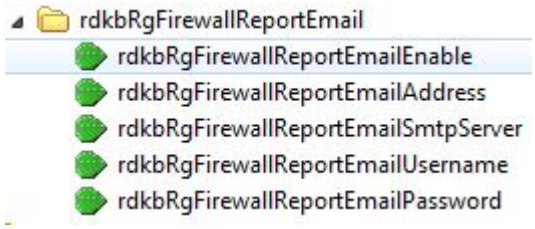
The email notifications would be sent to the mail server configured - SMTP server address, email address, user name and password should to be configured.

8.7.2 SNMP provisioning for Email

The following MIBs implement this feature:

S. No.	MIBs	Description
1	**rdkbRgFirewallReportEmailEnable**	Enables sending logs via email. Email is sent when an event happens

2	**rdkbRgFirewallReportEmailAddress**	This is stored in non-vol and is empty after factory reset.
3	**rdkbRgFirewallReportEmailSmtpServer**	IP address or FQDN. Stored in non-vol. Empty after factory reset.
4	**rdkbRgFirewallReportEmailUsername**	This is stored in non-vol and is empty after factory reset
5	**rdkbRgFirewallReportEmailPassword**	This is stored in non-vol and is empty after factory reset.



8.8 Report

This page displays all the events generated by firewall rules. For example, if the firewall breach attempt was registered, the same would be logged as a firewall breach attempt and shown under firewall logs. Similarly if there were incidents for Device filter, Service filter or Site filter restrictions, they would be shown in the respective logs. Each line item in the report display would have the timestamp of the last such occurrence, with number of attempts and the incident type with a brief description.

To display security reports, select the Security tab in the Gateway page and then select Report tab. Device Filter logs, Site Filter logs, Service Filter logs and Email Settings logs and Firewall Logs will be displayed as shown below:

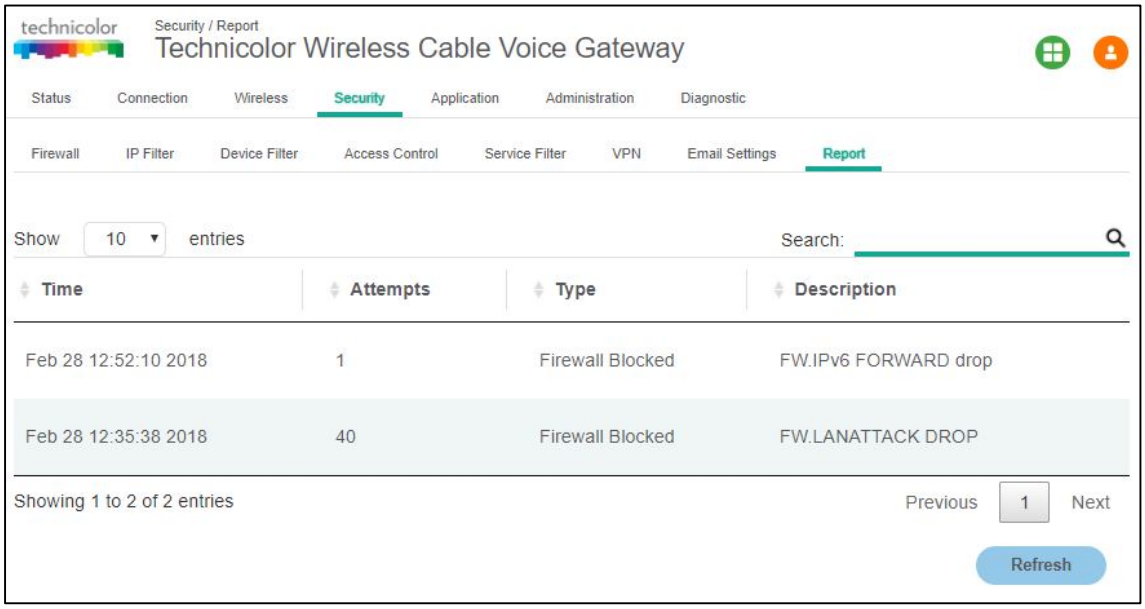

technicolor
Security / Report
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
Firewall
IP Filter
Device Filter
Access Control
Service Filter
VPN
Email Settings
Report
Show
10
entries
Search:
Time
Attempts
Type
Description
Feb 28 12:52:10 2018
1
Firewall Blocked
FW.IPv6 FORWARD drop
Feb 28 12:35:38 2018
40
Firewall Blocked
FW.LANATTACK DROP
Showing 1 to 2 of 2 entries
Previous
1
Next
Refresh

Figure 8.14

9 Applications

9.1 Port Forward

Port Forwarding allows running a publicly accessible server on the LAN by specifying the mapping of TCP/UDP ports to a local PC. To specify a mapping, enter the range of port numbers that should be forwarded locally, and the IP address to which traffic to those ports should be sent. If only a single port specification is desired, enter the same port number in the start and end locations for that IP address.

Application Tab / Port Forward

Click on the Application tab then click on the Port Forward settings tab. This page displays Port Forward information - Start Port, End Port, Type, Service IP, Service IPv6, Enable and Delete.

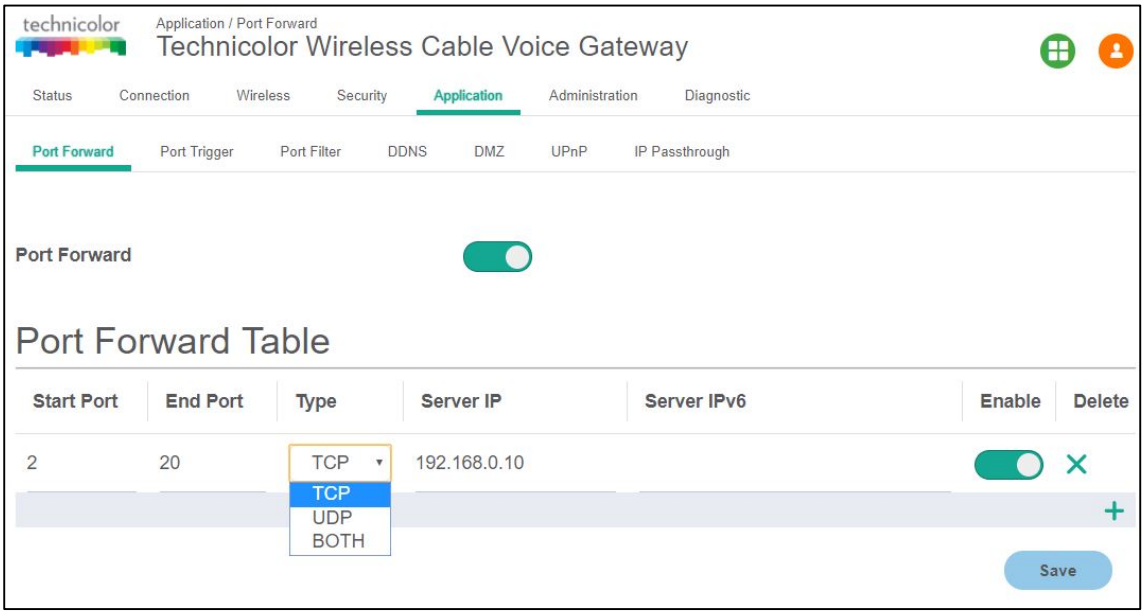


Figure 9.1

9.1.1 User provisioning for Port Forward

The user can select the range of ports and the types of traffic to be forwarded to an IP address. The range information can be configured in Start Port and End Port fields. Currently the option is to select either TCP traffic alone or UDP traffic alone or both. The user needs to provide the IP address details for the IPv4 and IPv6 traffic (as per the need).

Turning the enable button would enable the port forwarding feature; the entries can be deleted from the table using the Delete button.

9.2 Port Trigger

Port Triggers are similar to Port Forwarding except that they are not static ports held open all the time. When the CGA4131 detects outgoing data on a specific IP port number set in the Trigger Range, the resulting ports set in the Target Range are opened for incoming (or sometimes referred to as bi-directional ports) data. If no outgoing traffic is detected on the Trigger Range ports for 10 minutes, the Target Range ports will close.

This is a safer method for opening specific ports for special applications (e.g. video conferencing programs, interactive gaming, file transfer in chat programs, etc.) because they are dynamically triggered and not held open constantly or erroneously left open via the router administrator and exposed for potential hackers to discover.

Application Tab / Port Trigger

Click on the Application tab then click on Port Trigger settings tab. This page displays Port Trigger setup information (Trigger Port, Target Port, Type, Enable and Delete). In this view, the user can set/change the Port Trigger configuration

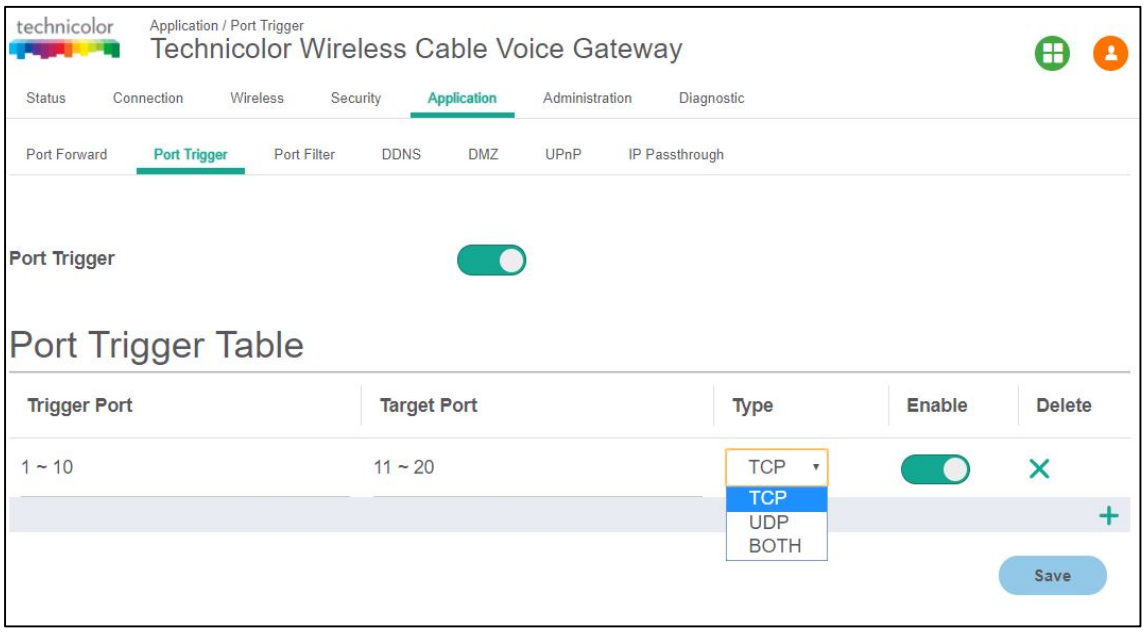


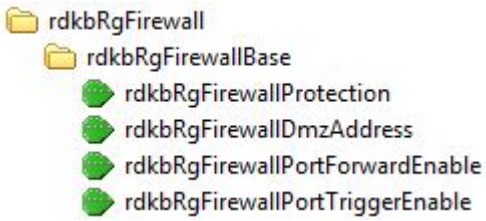
Figure 9.2

9.2.1 User provisioning for Port Triggering

The user has to select the port ranges for the Trigger ports and the port ranges for the target ports and the type of traffic (TCP, UDP or both) for configuring this feature. Enable and Delete buttons can be used to enable the feature and delete the configuration entry respectively.

9.2.2 SNMP provisioning for Port Forwarding and Port Triggering

S. No.	MIBs	Description
1	**rdkbRgFirewallApplySettings**	For Port Forwarding and Port Range Triggering, the following MIBs are used to control it: For all Firewall MIBs to be applied remember to set the **rdkbRgFirewallApplySettings** to 1.
2	**rdkbRgFirewallPortForwardEnable**	**rdkbRgFirewallPortForwardEnable** sets *True* to enable, *False* to Disable. Default is *False*.
3	**rdkbRgFirewallPortTriggerEnable**	**rdkbRgFirewallPortTriggerEnable**sets*True* to enable, *False* to Disable. Default is *False*.



9.3 Port Filter

The Port Filter page is used to block certain port requests coming from the LAN to WAN devices connected through the router. User can block the range of ports to be blocked by configuring them for a particular traffic.

Application Tab / Port Filter
Click on Application tab then click on Port Filter tab. The page displays following Port Filter setup information, which can be viewed and modified by user:

- Range of Ports
- Traffic / Protocol
- Enable the filter
- Delete the filter entry

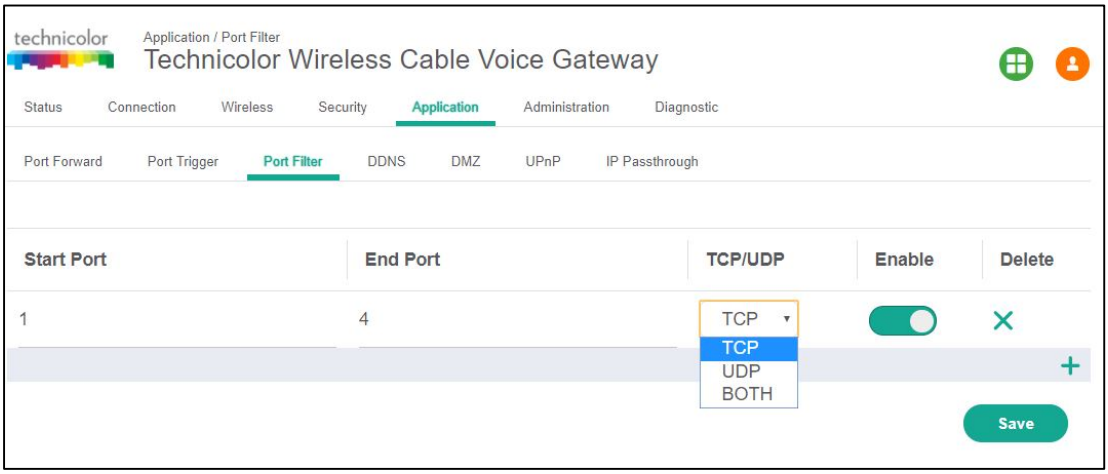


Figure 9.3

9.3.1 User provisioning for Port Filter

The user has to select the port ranges for Port Filter feature and the type of traffic (TCP, UDP or both) for configuring this feature. Enable and Delete buttons can be used to enable the feature and delete the configuration entry respectively.

9.4 DDNS

Dynamic DNS (DDNS) allows a dynamic IP address to be aliased to a static, predefined host name so that the host can be easily contacted by other hosts on the internet even if its IP address changes. TheCGA4131 supports a dynamic DNS client compatible with the Dynamic DNS service (http://www.dyndns.com/).

Application Tab/ DDNS

Click on the Application tab then click on DDNS tab. This page displays DDNS setup information. Here, user can set and display DDNS (Disable, DynDns.org, TZO.com, Changeip.com, and Freedns.afraid.org), Username, Password and Hostname.

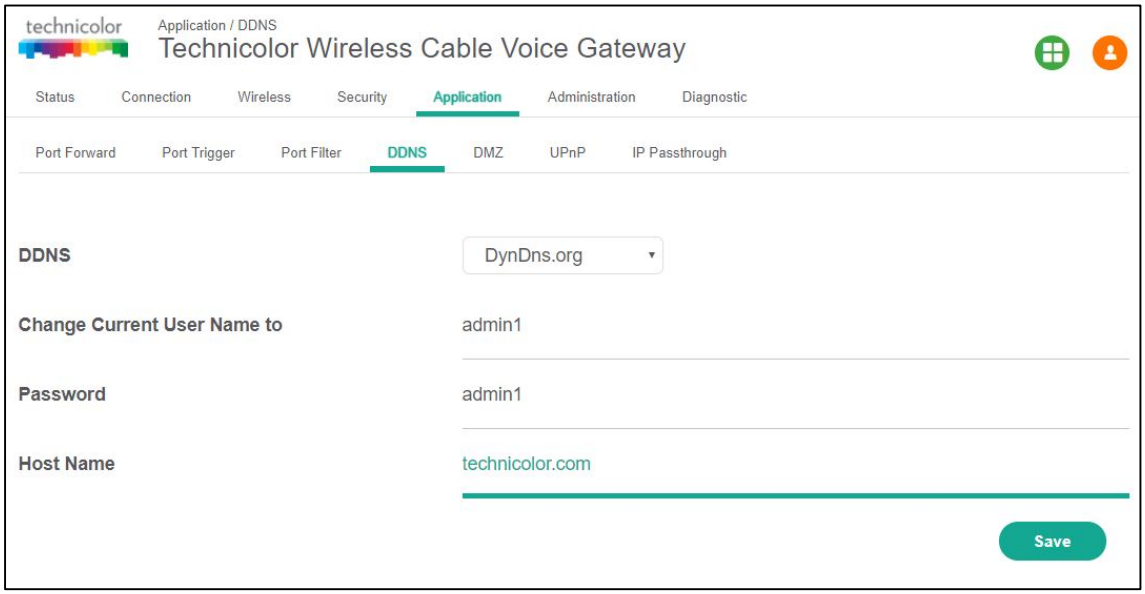


Figure 9.4

9.4.1 User provisioning for DDNS

The user needs to have an account in the DDNS server. The hostname and the public IP of the eRouter will be configured in the DDNS server for the given account. In the Web UI, the user has to select the DDNS service provider URL, credentials of the account to log into the URL and the predefined hostname.

9.5 DMZ

The DMZ feature exposes the network user to the Internet for using special-purpose services such as Internet Gaming or Video Conferencing. DMZ hosting forwards all the ports at the same time to one computer. The Port Forwarding feature is more secure because it only opens the ports the user want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer to the Internet. This is generally used if PCs are running specific applications that use random unknown port numbers and do not function correctly with specific port triggers or port forwarding setups. It is advisable not to have any PCs/Servers as DMZ hosts because of exposure to the public internet which results from this configuration. Remember to disable this setting if this is enabled temporarily for any specific application.

Any computer whose port is being forwarded must have its DHCP client function disabled and should have a static IP address assigned to it because its IP address may change when it is using the DHCP function.

Application Tab/ DMZ
Click on Application tab then click on DMZ tab. This page displays DMZ setup information.

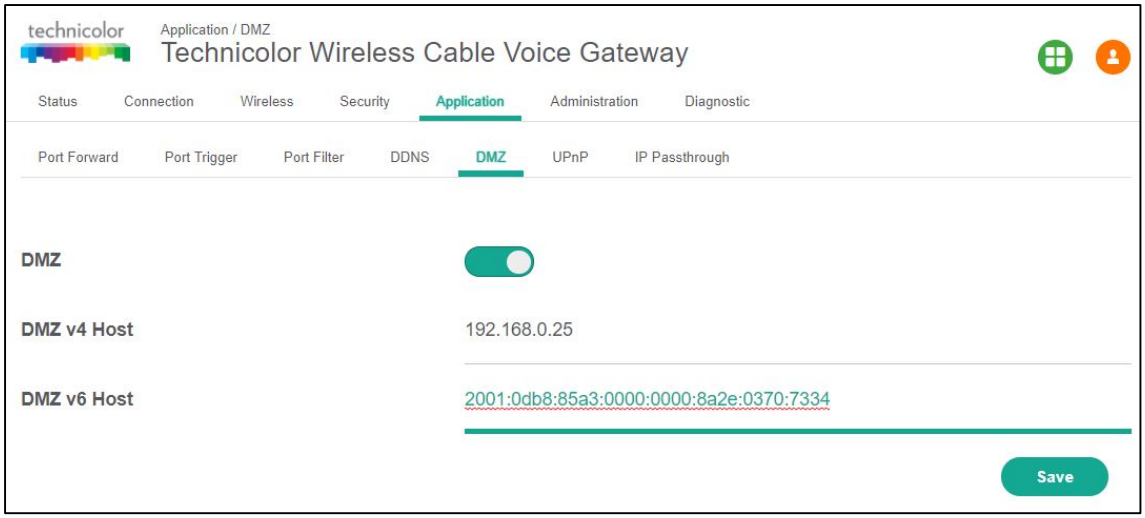
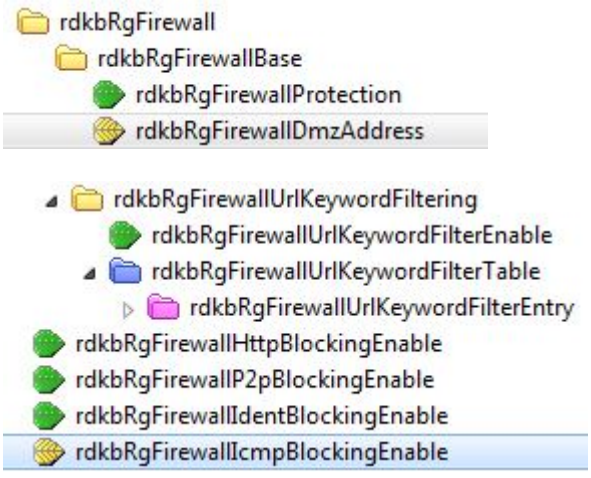


Figure 9.5

Here a user can enable the DMZ feature, enter the host address (both IPv4 and IPv6) and save the configuration.

9.5.1 SNMP provisioning for DMZ

S. No.	MIBs	Description
1	**rdkbRgFirewallDmzAddress**	For DMZ Host IP address set the following MIB
2	**rdkbRgFirewallApplySettings**	For all firewall MIBS set the **rdkbRgFirewallApplySettings** to 1 to take effect.



9.6 UPnP

Universal Plug and Play (UPnP) allows client devices to automatically configure the device for various Internet applications, such as gaming and video conferencing. This protocol messaging over the LAN can be enabled or disabled.

Application Tab / UPnP

Click on the Application tab, and then click on UPnP tab. The page displays UPnP setup information as shown below:

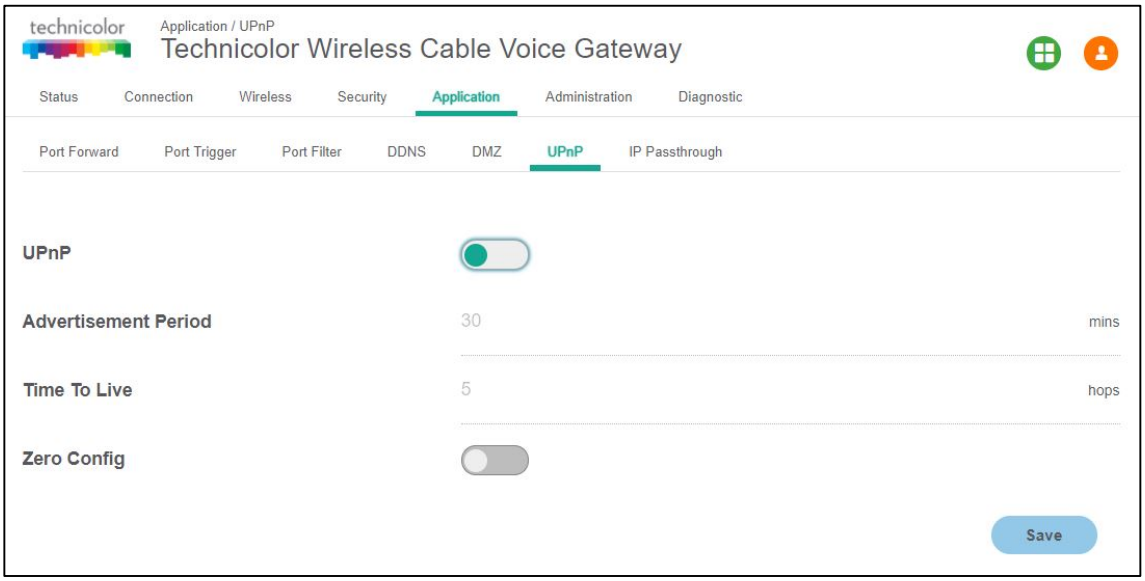


Figure 9.6

9.6.1 User provisioning of UPnP

The following parameters can be configured by the user:

1. Enable/Disable UPnP
2. Set the UPnP Advertisement Period - The advertisement period is how often the device advertises (broadcasts) its UPnP information. This value can range from 1 to 1440 minutes. The default period is 30 minutes. Shorter durations ensure that control points have current device status at the expense of additional network traffic.
3. Advertisement TTL - The time to live for the advertisement is measured in hops (steps) for each UPnP packet sent. A hop is the number of steps allowed to propagate for each UPnP advertisement before it disappears. The number of hops can range from 1 to 255. The default value for the advertisement time to live is 5 hops.
4. Zero Config – The UPnP architecture supports zero configuration networking. An UPnP compatible device from any vendor can dynamically join a network, obtain an

IP address, announce its name, advertise or convey its capabilities upon request, and learn about the presence and capabilities of other devices.

The user needs to select the required values and options for the above parameters and press Save button to save them.

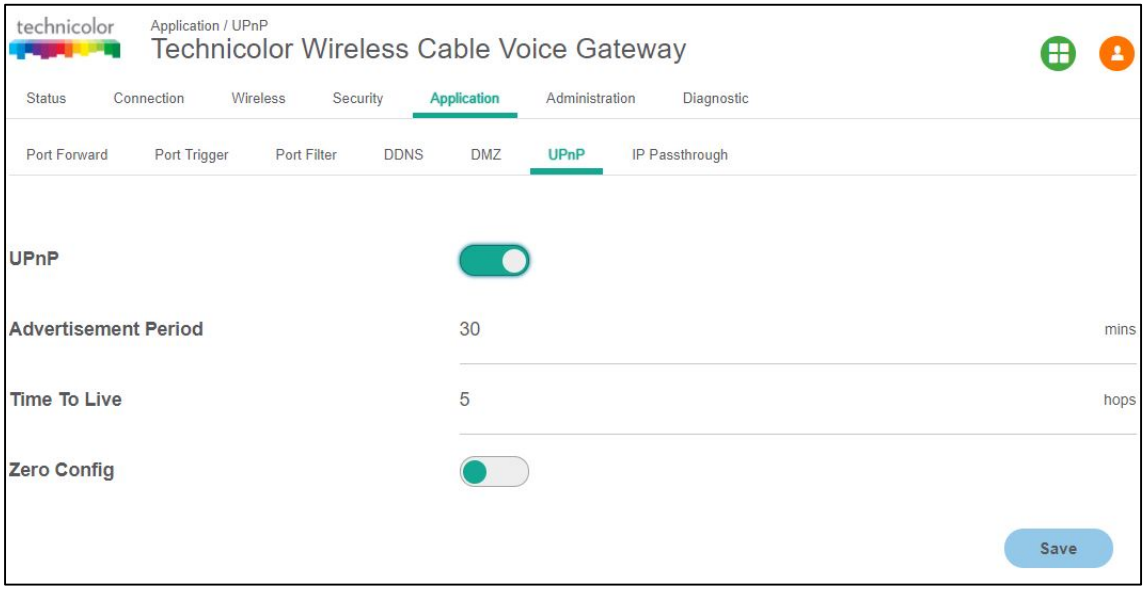


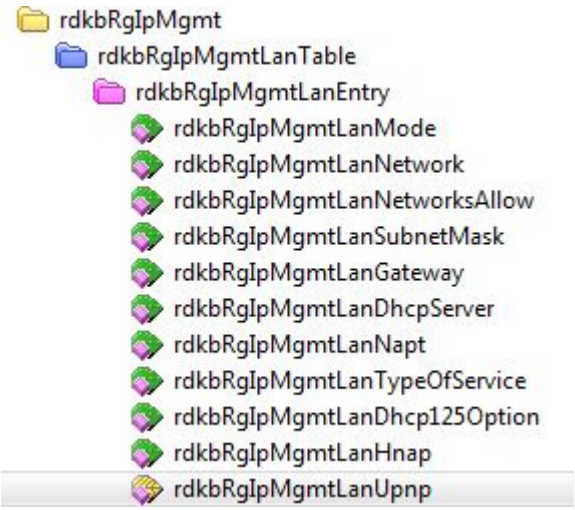
Figure 9.7

9.6.2 SNMP provisioning for UPnP

The UPnP feature is controlled via **rdkbRgIpMgmtLanUpnp**.

S. No.	MIBs	Description
1	**rdkbRgIpMgmtLanUpnp**	Enable/Disable the UPnP agent

Since the MIB is a table for different SSID, UPnP configuration is supported on all primary as well as secondary SSIDs.



9.7 IP Passthrough

IP Passthrough allows the user to assign a public IP address to a device connected to CGA4131 on the LAN side, effectively bypassing the internal router IP.

Application Tab/ IP Passthrough
Click on the Application tab, and then click on IP Passthrough tab. The page displays setting up information IP Passthrough. Here, the user can set and display IP Passthrough and CPE List (MAC Address).

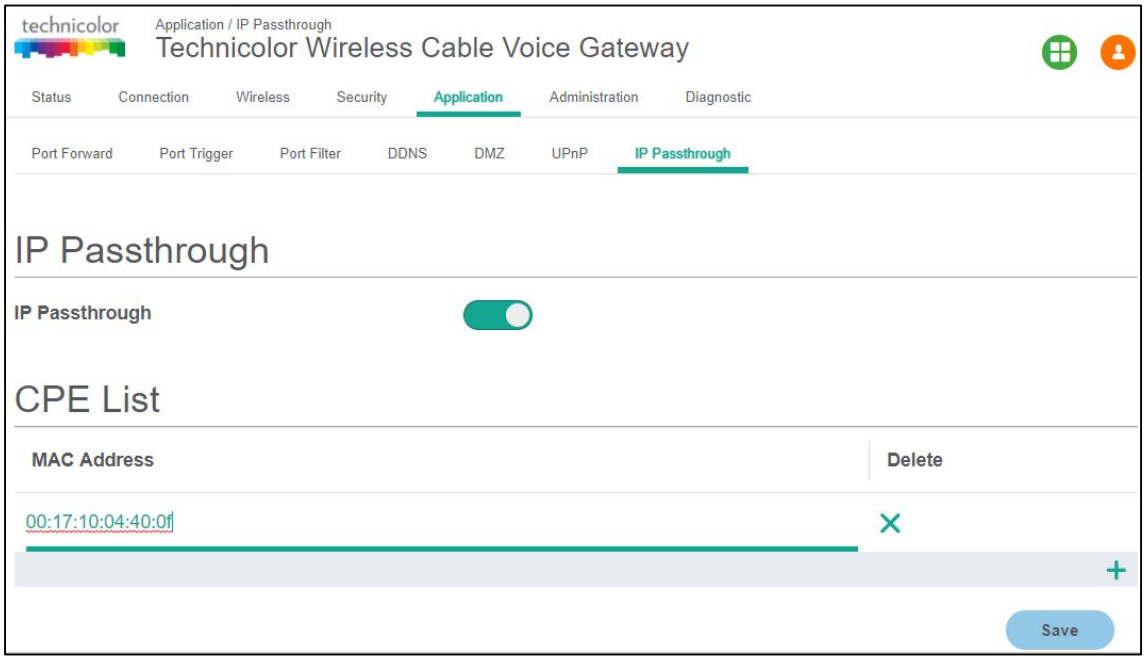


Figure 9.8

9.8 SIP ALG

ALG stands for Application Layer Gateway. An ALG understands the protocol used by the specific applications that it supports (in this case SIP) and does a protocol packet-inspection of traffic through it. When the ALG option is turned on in the gateway, gateway will re-write information within the SIP messages (SIP headers and SDP body) making signaling and audio traffic between the client behind NAT and the SIP endpoint possible. This page provides an option to enable or disable the SIP ALG support.

Application Tab/ SIP ALG

Click on the Application tab, and then click on SIP ALG tab. The page displays an option to enable or disable the SIP Application Layer Gateway. The user can click on the button to enable or disable the ALG support.

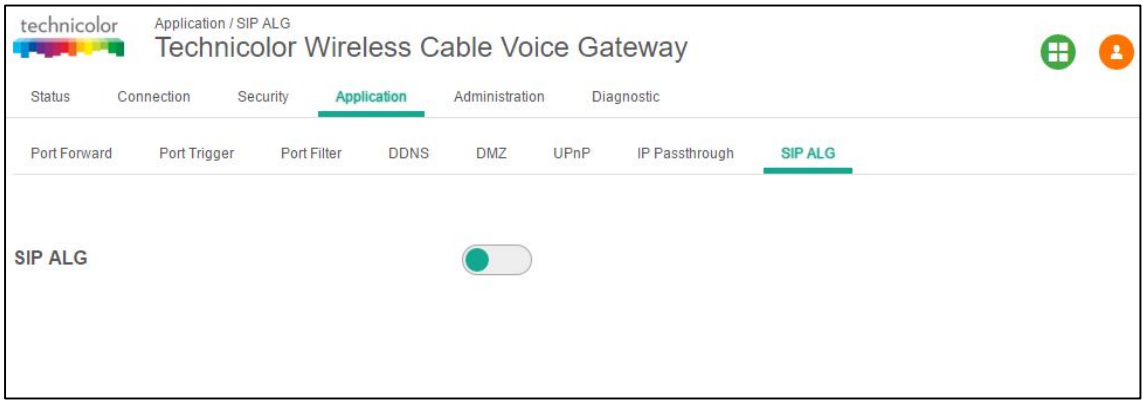

technicolor
Application / SIP ALG
Technicolor Wireless Cable Voice Gateway
Status
Connection
Security
Application
Administration
Diagnostic
Port Forward
Port Trigger
Port Filter
DDNS
DMZ
UPnP
IP Passthrough
SIP ALG
SIP ALG

Figure 9.9

10 Administration

10.1 User

There are two user profiles for CGA4131 – home user and advanced user. When logged in as home user, via Web UI, this page provides options to change the default Username and the password.

Administration / User
Click on the Administration tab and then the User tab. The page appears with the information below. The user name and password can be entered into the various fields and changed.

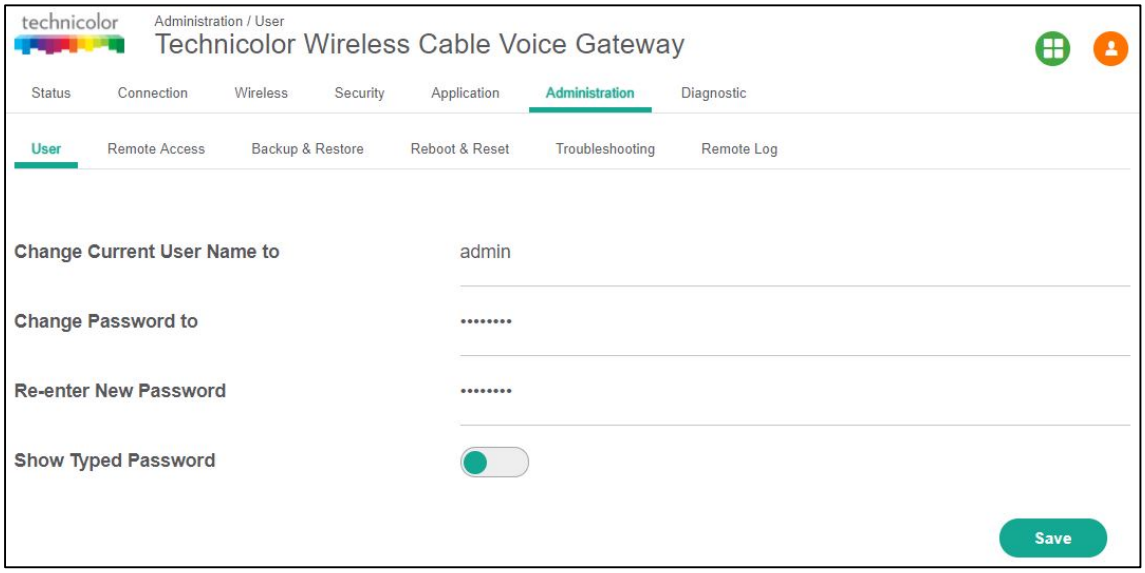


Figure 10.1

10.2 Remote Management

Remote Management feature enables access to Web UI using eRouter IP address from the WAN side.

Administration / Remote Access
Click on the Administration tab and then the Remote Access tab. The options selected under Remote Management can be applied to a single computer, range of computers or any computer by selecting the corresponding options provided against the Access Type tab. Specific details of IP address or IP address range have to be provided to complete the configuration of the remote management. Various configurations are provided in the figures below.

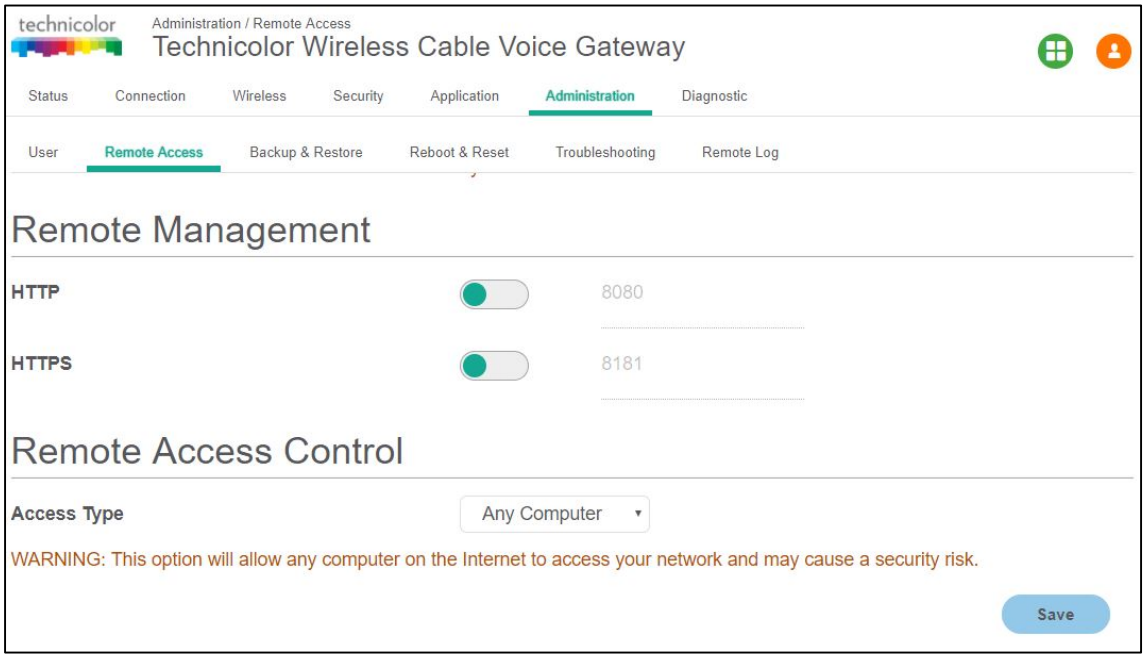


Figure 10.2

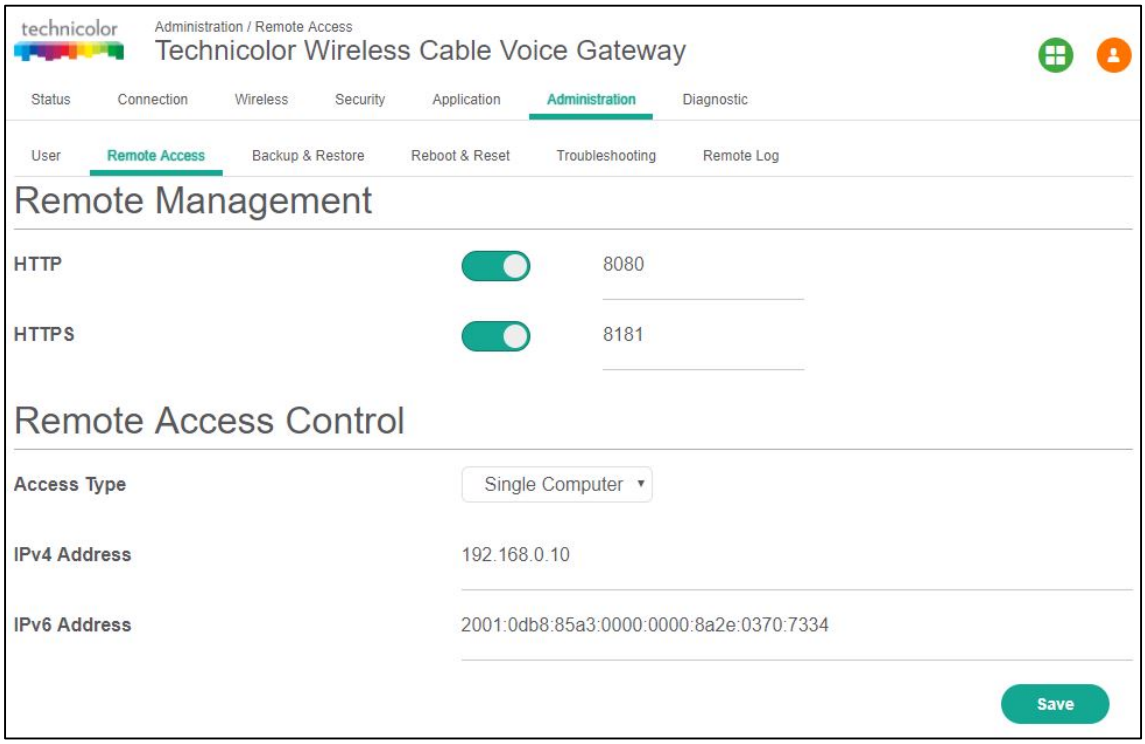


Figure 10.3

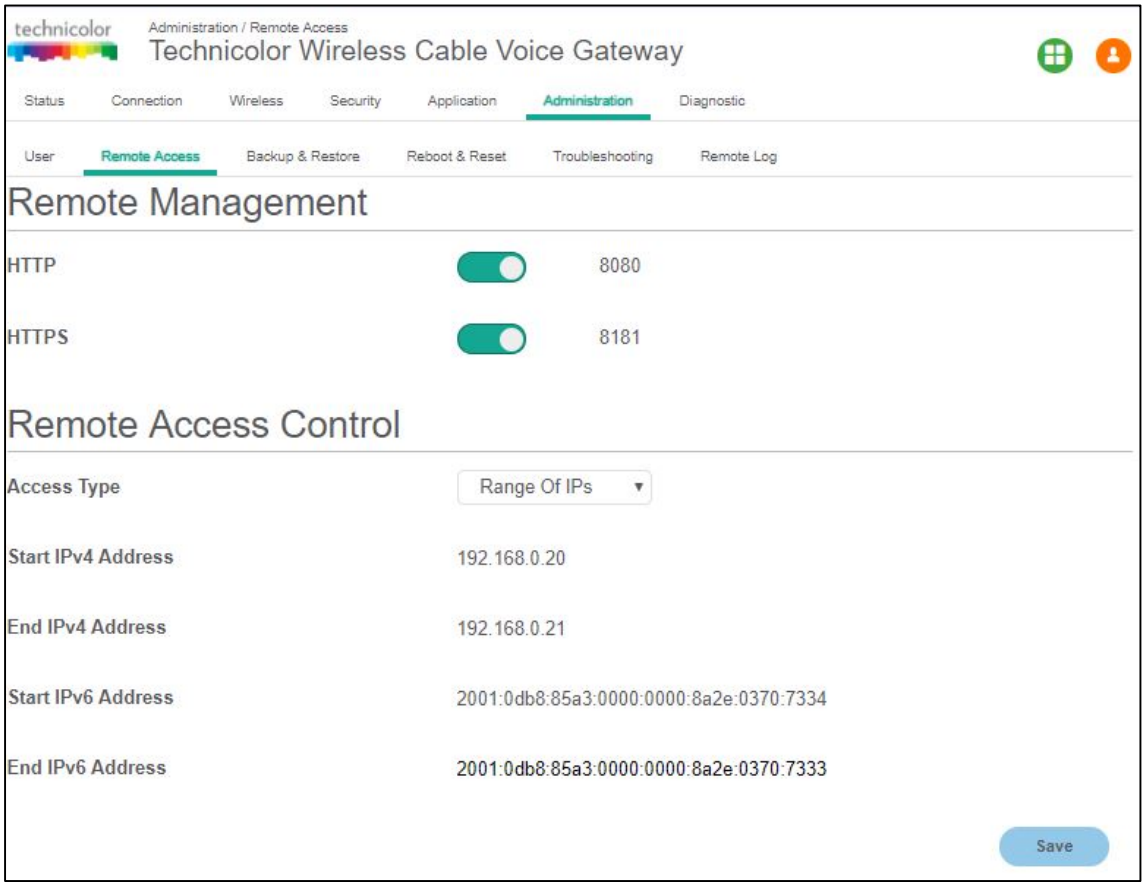


Figure 10.4

10.2.1 SNMP provisioning for Remote Management

The Remote Management in Web UI is controlled though the web access control MIBs.

When tchCmWebAccessUserIfLevel.home-user.rg-wan is set to 100, remote access through eRouter IP address is allowed with the home user credentials and the Remote Management option shows “Enabled” in the Web UI. On disabling the remote management in Web UI, the MIB value is automatically set to “0” and no access through eRouter IP is available.

When tchCmWebAccessUserIfLevel.adv-user.rg-wan is set to 100, remote access through eRouter IP address is allowed with the advanced user credentials and the Remote Management option shows “Enabled”. On disabling the remote management in Web UI, the MIB value is automatically set to “0” and no access through eRouter IP is available.

10.2.2 Telnet / SSH access

CGA4131 supports Telnet / SSH to the CM Console. The user needs to login with CM IP and user credentials need to be entered. User needs to configure the following MIBs for the same:

- tchCmMtaCliAccessType - Controls telnet/SSH access to the CM IP Address
- tchCmMtaCliAccessUsername - Username string
- tchCmMtaCliAccessPassword - Password string

10.3 Backup & Restore

The backup feature saves the current CGA4131 configuration to a local PC. These settings can be restored later if a configuration needs to be restored, or to recover from changes that have had an undesirable effect.

To back up the current configuration, click Backup and follow the prompts. To restore a previous configuration, click Browse and use the navigation window to locate the file. (The default file name is filename_YY_MM_DD_HOUR_MINUTES.gwc).Note that this file is encrypted. When the file has been located, click Restore to restore the settings. When the settings are restored, the device will reboot to the restored settings.

10.3.1 User provisioning for Backup & Restore

Administration Tab/ Backup & Restore
Click on the Administration tab and then the Backup & Restore tab. This page displays Backup & Restore setup information.

The user can back up the configuration data to a specific file or restore the already backed up data from a file.

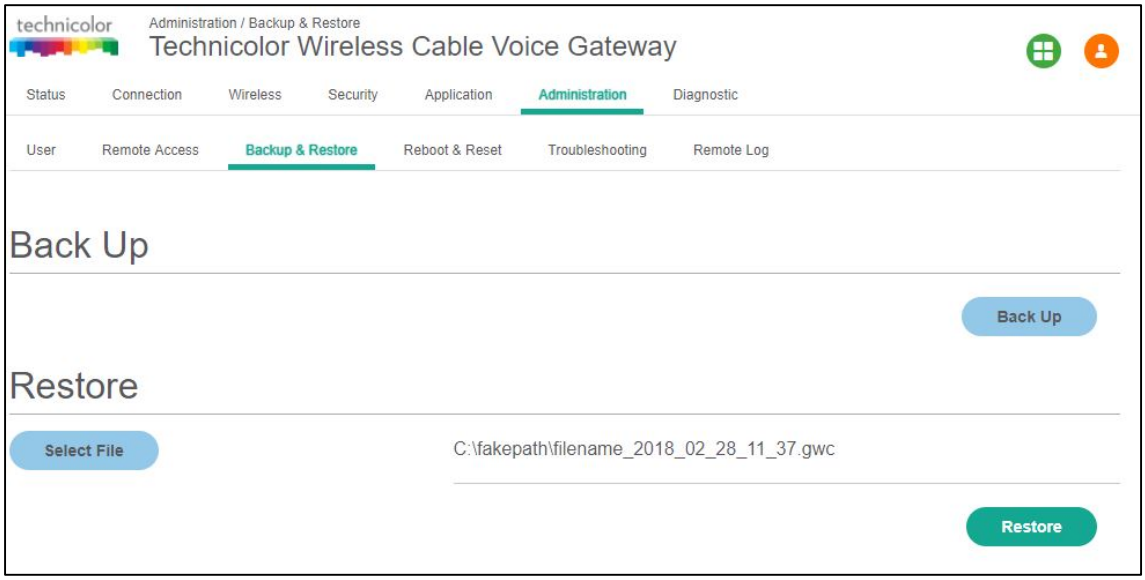


Figure 10.5

10.4 Reboot & Reset

Administration Tab / Reboot & Reset

Click on the Administration tab and then the Reboot & Reset tab. The page displays Reboot and Reset options –Reboot Wi-Fi module, Reboot Wi-Fi Router, Reboot System, Reset User Name & Password, Reset Wi-Fi Setting and Reset Factory Settings.

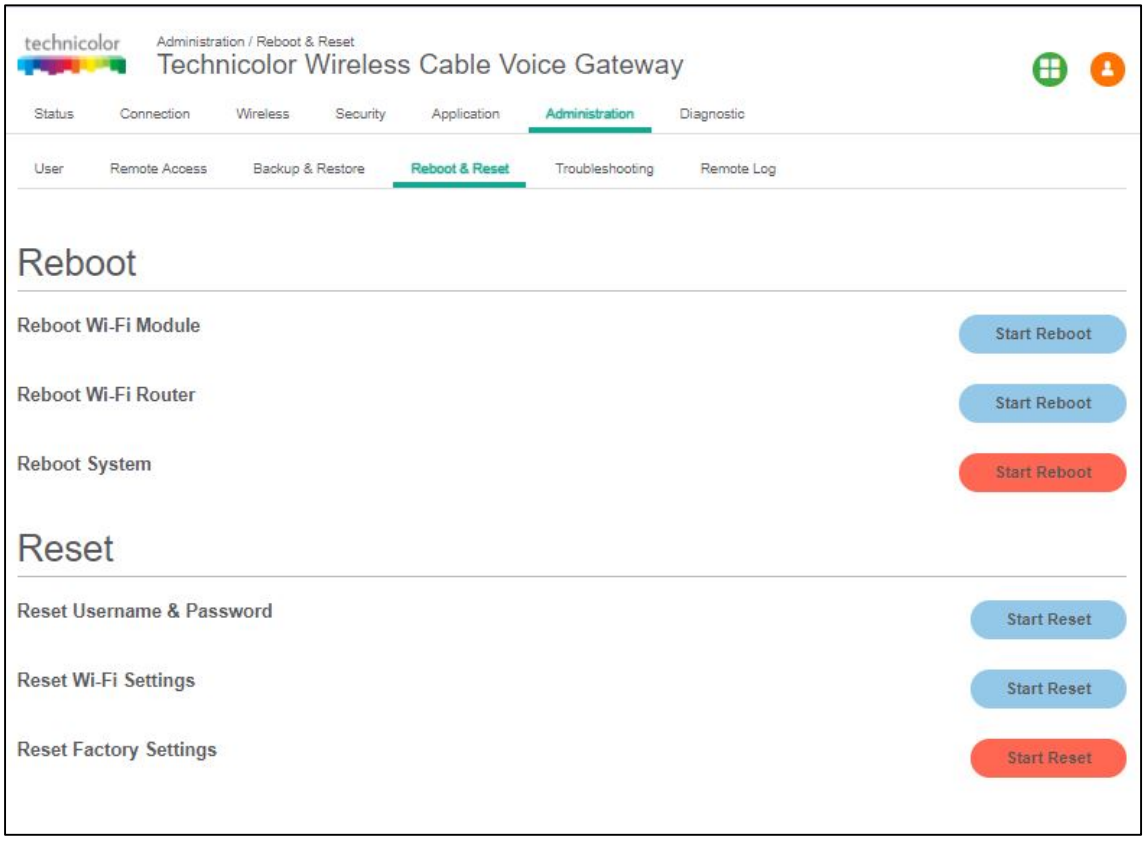


Figure 10.6

10.4.1 Factory Reset

In rare cases, it may be necessary to restore the factory default settings. This can be done from the Administration Page, which can be accessed from the Reboot & Reset tab.

To restore factory defaults, select the Restore Factory Defaults button and click Apply. This will cause the device to reset.After factory reset is done, the user has to login to the Web UI default username and password. The user is promoted to change default username and password.

There is no factory default password. Another option to restore the factory setting is using Reset button on front panel of box.

10.4.2 SNMP provisioning for Reset & Reboot

S. No.	MIBs	Description
1	**tchCmAPResetNow**	Setting this object to true(1) causes the device to reset as momentary activation of reset switch
2	**tchcmAPFactoryReset**	It can be set with a sequence of values to activate a remote factory reset. This is the same as a sustained (3 seconds or more) reset switch. Reading this object always returns false (2).

10.4.3 Reset Username & Password

In the Reboot&Reset page, click Start Reset option for Reset username & password. The Web UI username and password will be reset to default values. Once the username and password are reset, on the next login, the user would be asked to change the default password.

S. No.	MIBs	Description
1	**tchCmWebAccessHomeUserClearPassword**	Clears home-user passwords if set to true. Always returns false when read.

10.5 Troubleshooting

Ping and Trace route are available in the Troubleshooting options. This can be done for both the IPv4 and IPv6 networks.

Administration / Trouble Shooting
Click on the Administration tab then click on the Troubleshooting tab. The page provides views for running ping (to check the network connectivity to a particular IPv4 or IPv6 address) and trace route (for displaying the route/path and measuring transit delays of packets across the network.

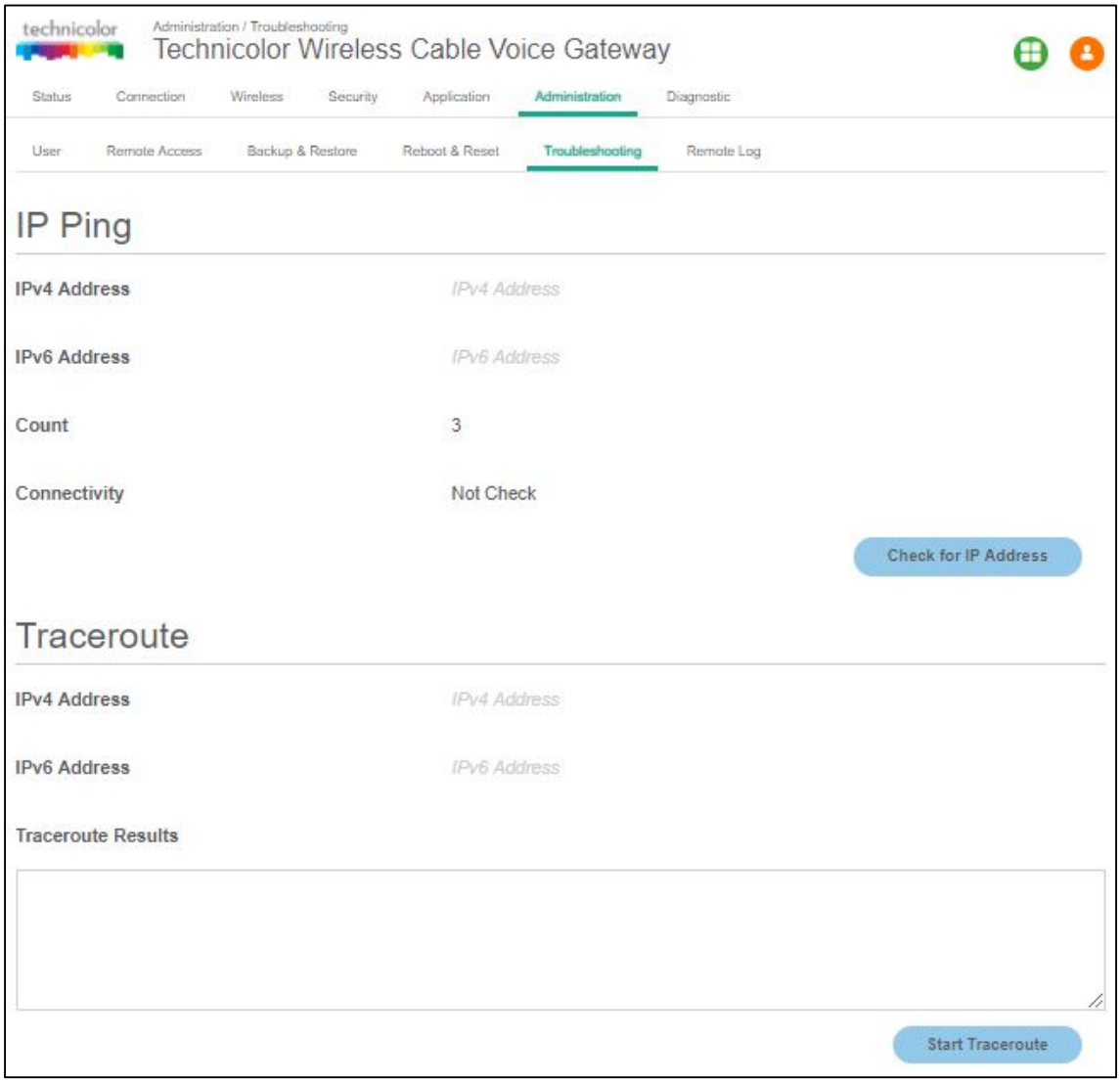


Figure 10.7

10.6 Remote Log

Remote Log view provides an option to add a log server and specify the kind of logs (including log levels) needed for any particular troubleshooting.

Administration / Remote Log
Click on the Administration tab then click on the Remote Log tab. The current logging configurations – module & log levels – would be displayed.

The User can modify the modules (System, Event, and Firewall) for logging and the log levels (Critical, Major, Minor, Warning and Inform) to be logged and save the configuration for future logging. The logging server details also need to be entered.

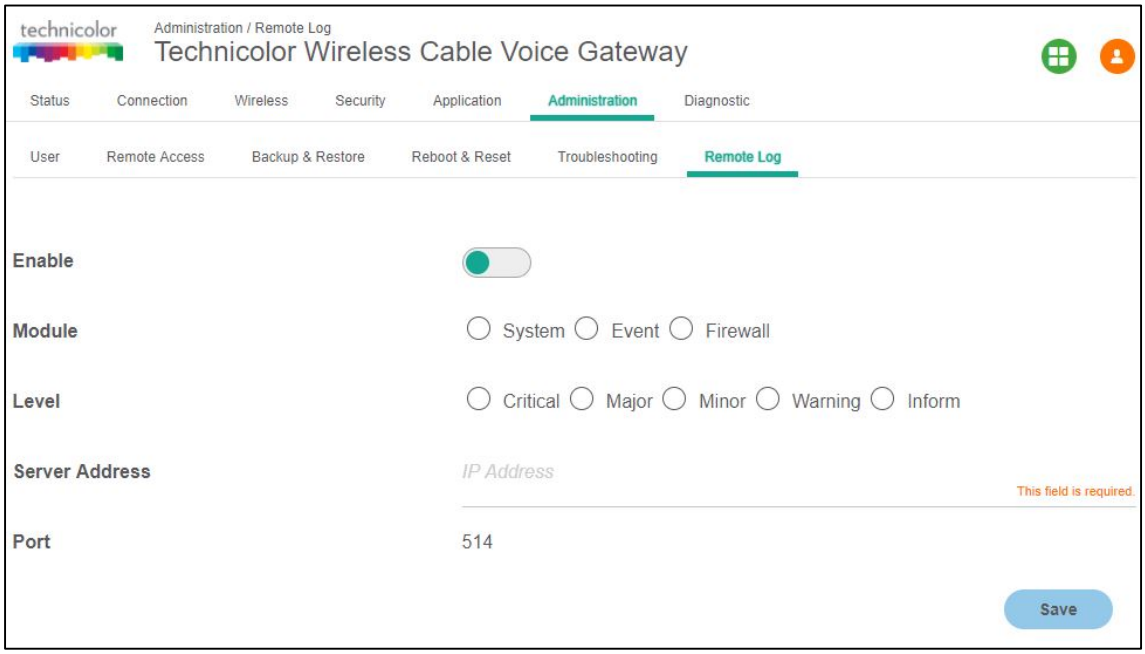

technicolor
Administration / Remote Log
Technicolor Wireless Cable Voice Gateway
Status
Connection
Wireless
Security
Application
Administration
Diagnostic
User
Remote Access
Backup & Restore
Reboot & Reset
Troubleshooting
Remote Log
Enable
Module
System
Event
Firewall
Level
Critical
Major
Minor
Warning
Inform
Server Address
IP Address
This field is required.
Port
514
Save

Figure 10.8

11 Diagnostics

This section provides details about the various diagnostic features built in CGA4131 TCH2-GA-TBR.

11.1 System

This page displays the system status. The details shown are system uptime and resource usage such as CPU and memory.

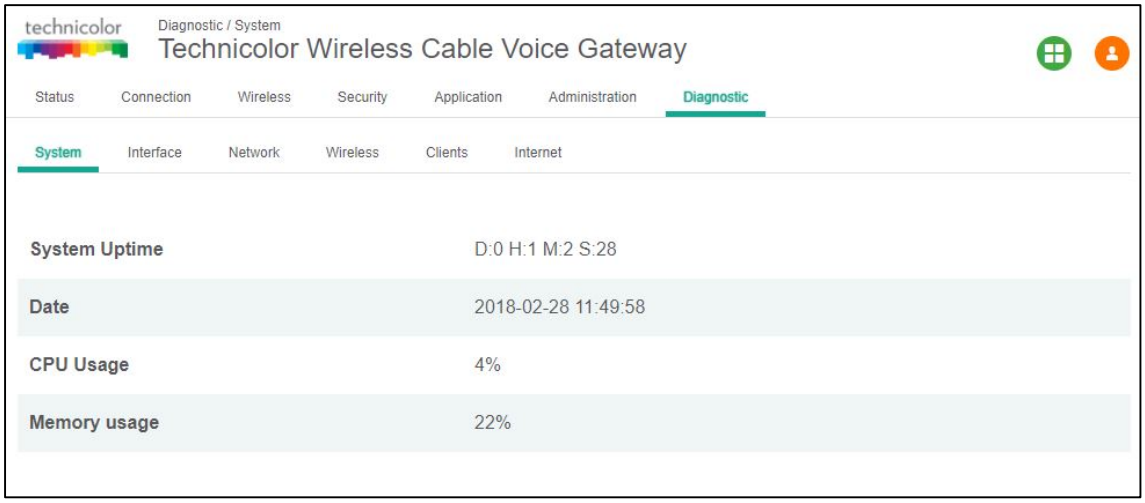


Figure 11.1

11.2 Interface

This page displays the up/down status, various configurations, data traffic and error information for various interfaces in the system (WAN, LAN and Wi-Fi).

The figure below provides WAN interface status and traffic/error statistics.

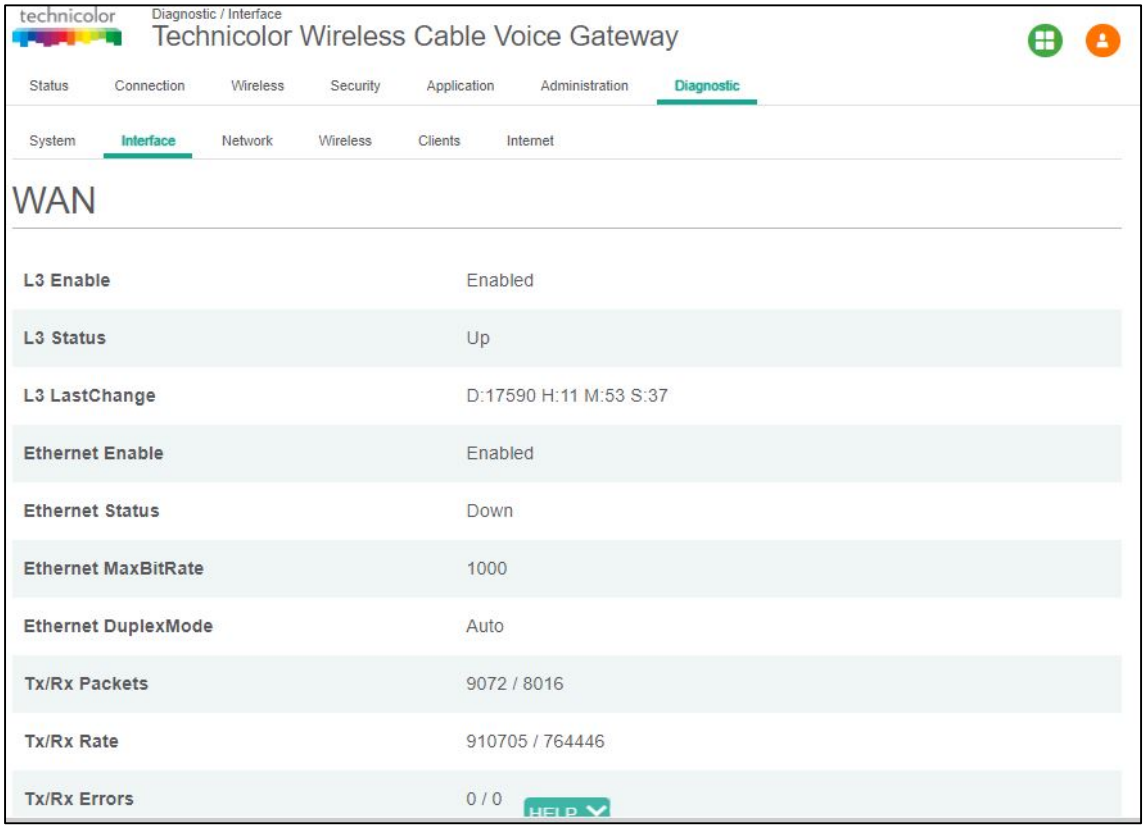


Figure 11.2

The figure below provides LAN interface status and traffic/error statistics.

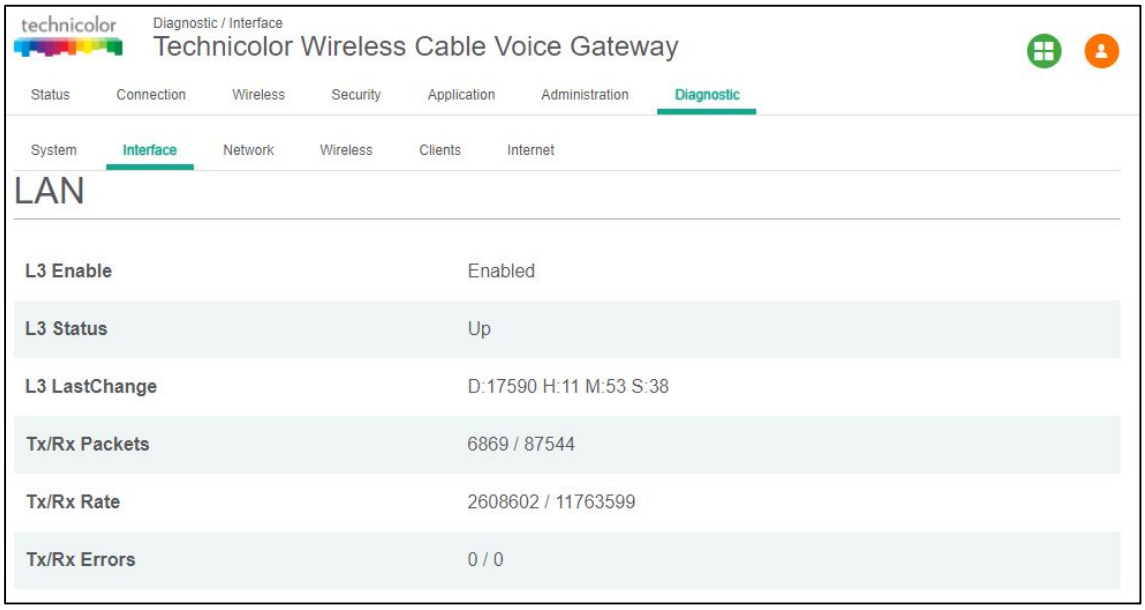


Figure 11.3

The figure below provides status and traffic/error statistics for each of the Ethernet ports.

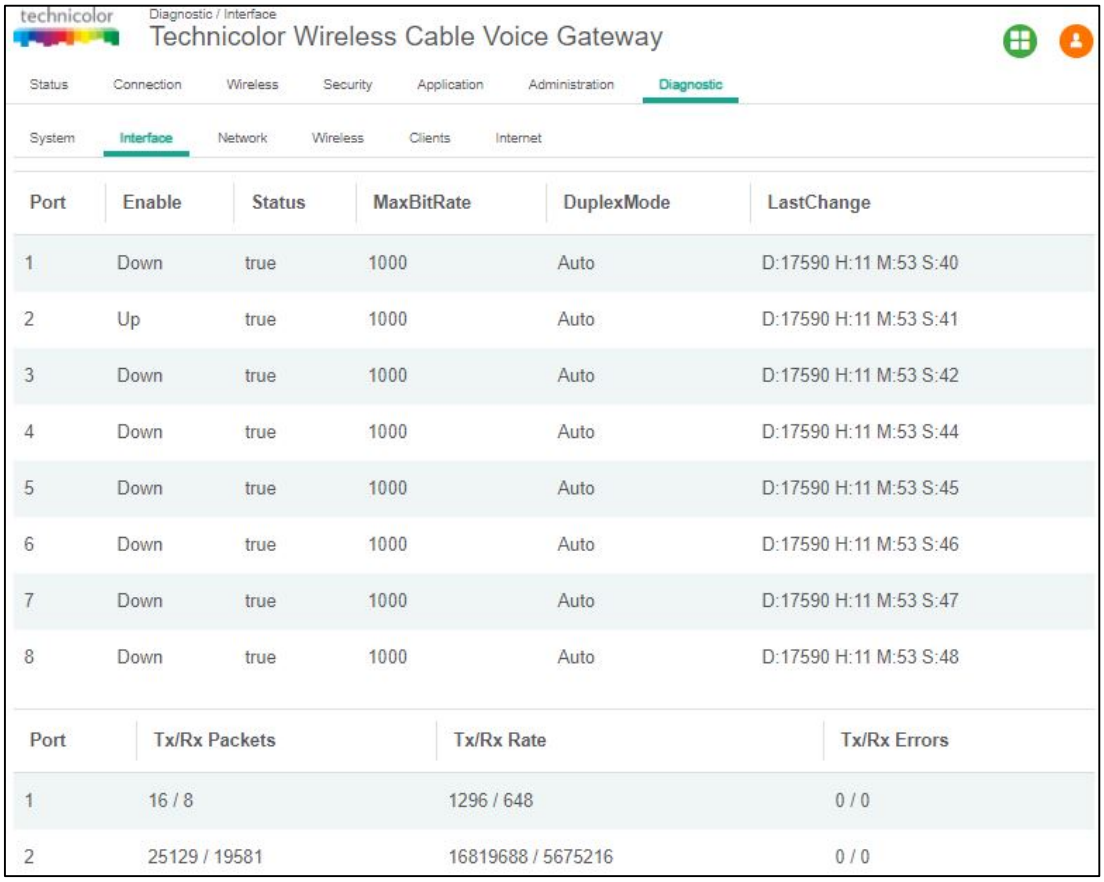


Figure 11.4

The figures below provides status and traffic/error statistics for 2.4GHz network.

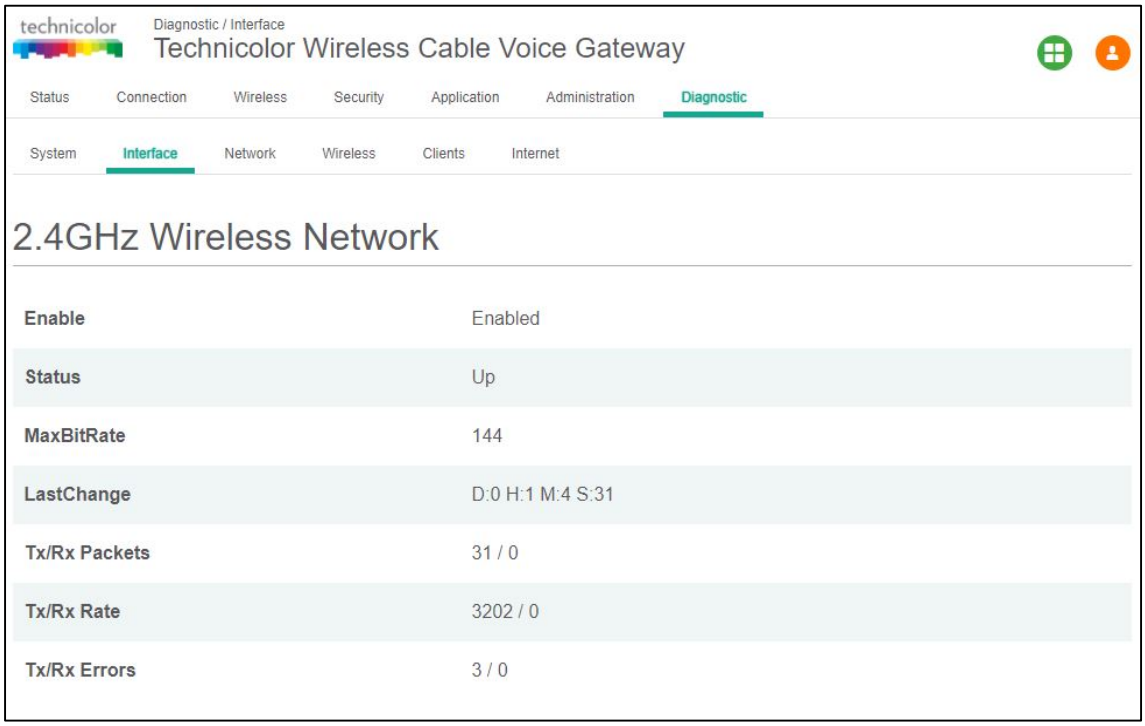


Figure 11.5

The figures below provides status and traffic/error statistics for 5GHz network.

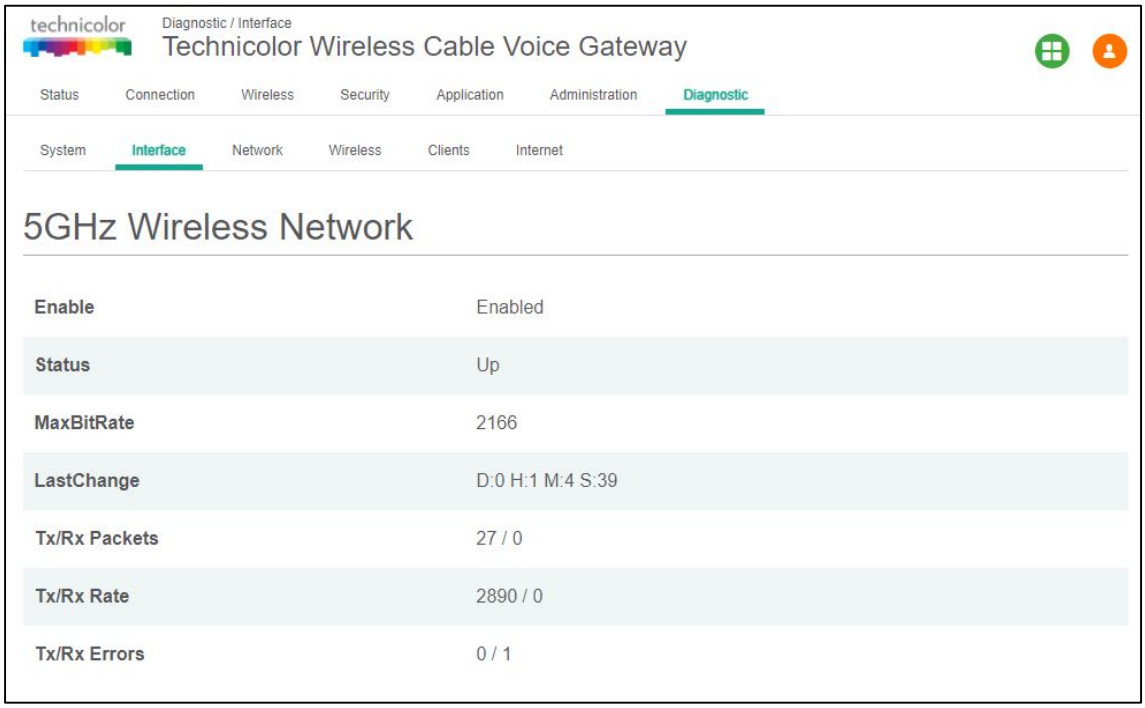


Figure 11.6

11.3 Network

This section provides the configuration status for LAN side configurations. The figure below displays the Gateway configuration (Operational status, Router/Bridge mode, support for IPv4 or IPv6 or both protocols).

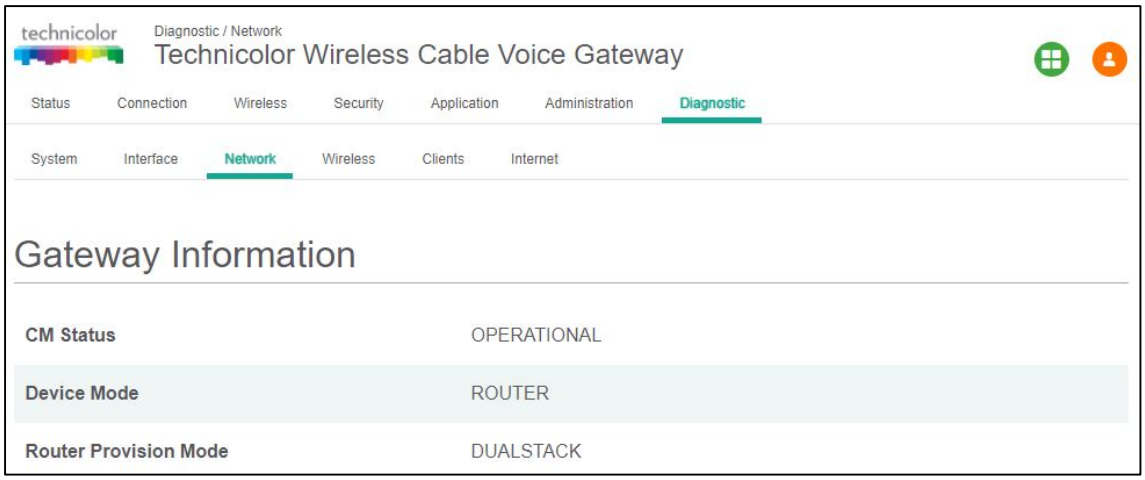


Figure 11.7

This figure displays the IPv4 configuration status.

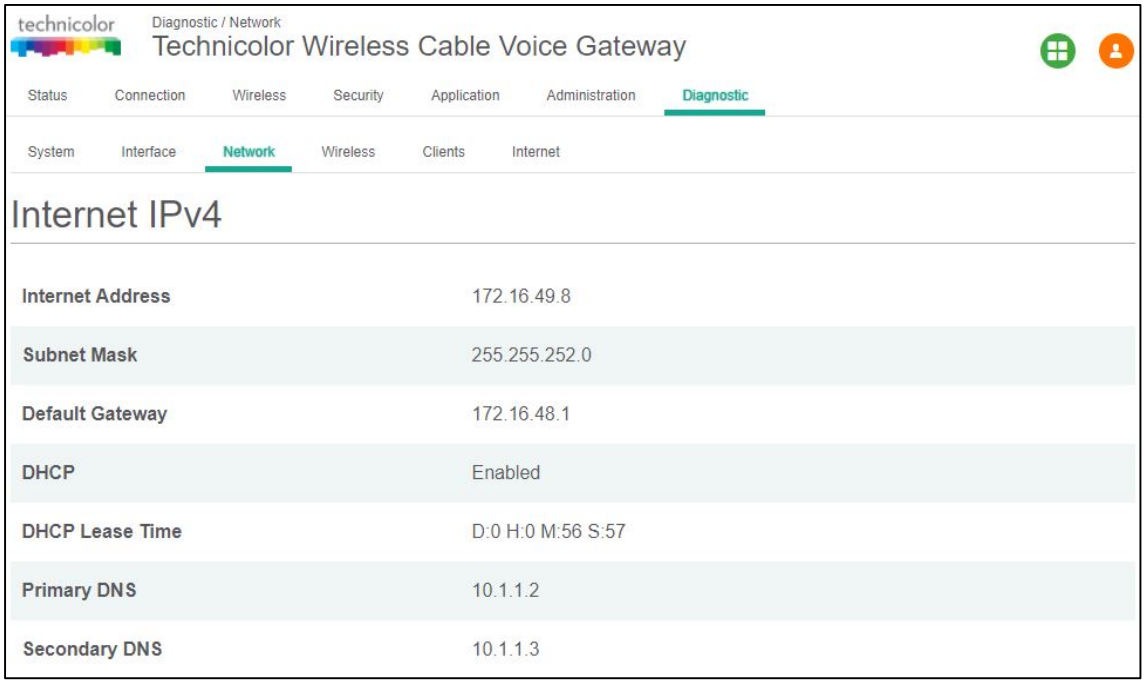


Figure 11.8

This figure displays the IPv6 configuration status.

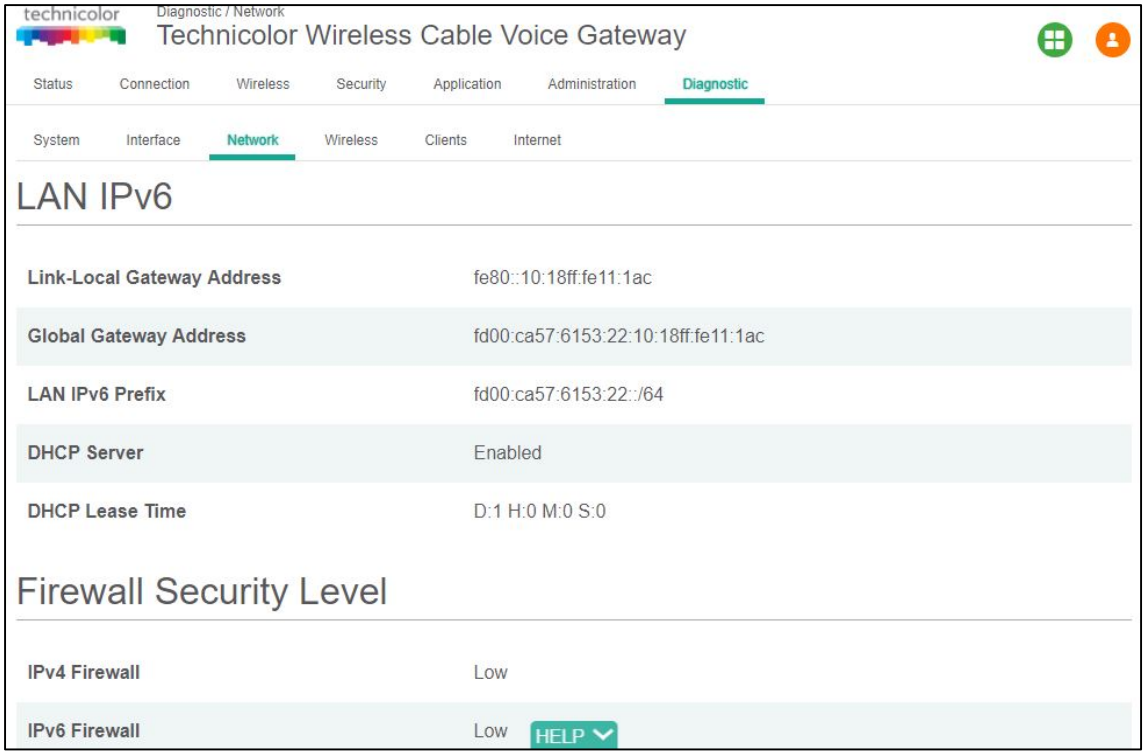


Figure 11.9

11.4 Wireless

This section shows Wi-Fi configuration for 2.4GHz and 5GHz networks including Network Name, Wi-Fi MAC address, network mode, channel bandwidth, channel numbers, security mode, and SSID broadcast status (enabled / disabled).

The figure below shows the 2.4GHz network configuration and the list of devices connected to the 2.4GHz network. For each of the devices, the network configuration, traffic statistics / errors and signal strength.

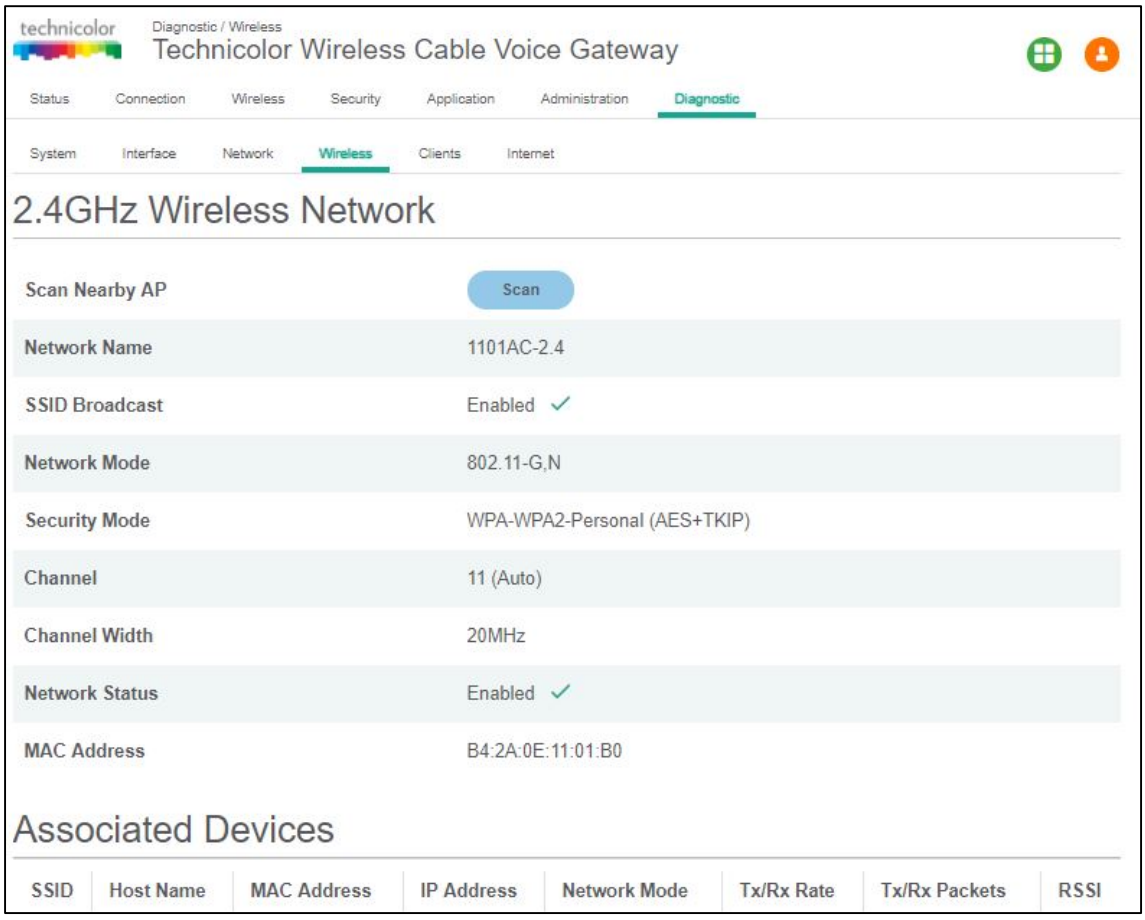


Figure 11.10

The figure below shows the 5GHz network configuration and the list of devices connected to the 5GHz network. For each of the devices, the network configuration, traffic statistics / errors and signal strength.

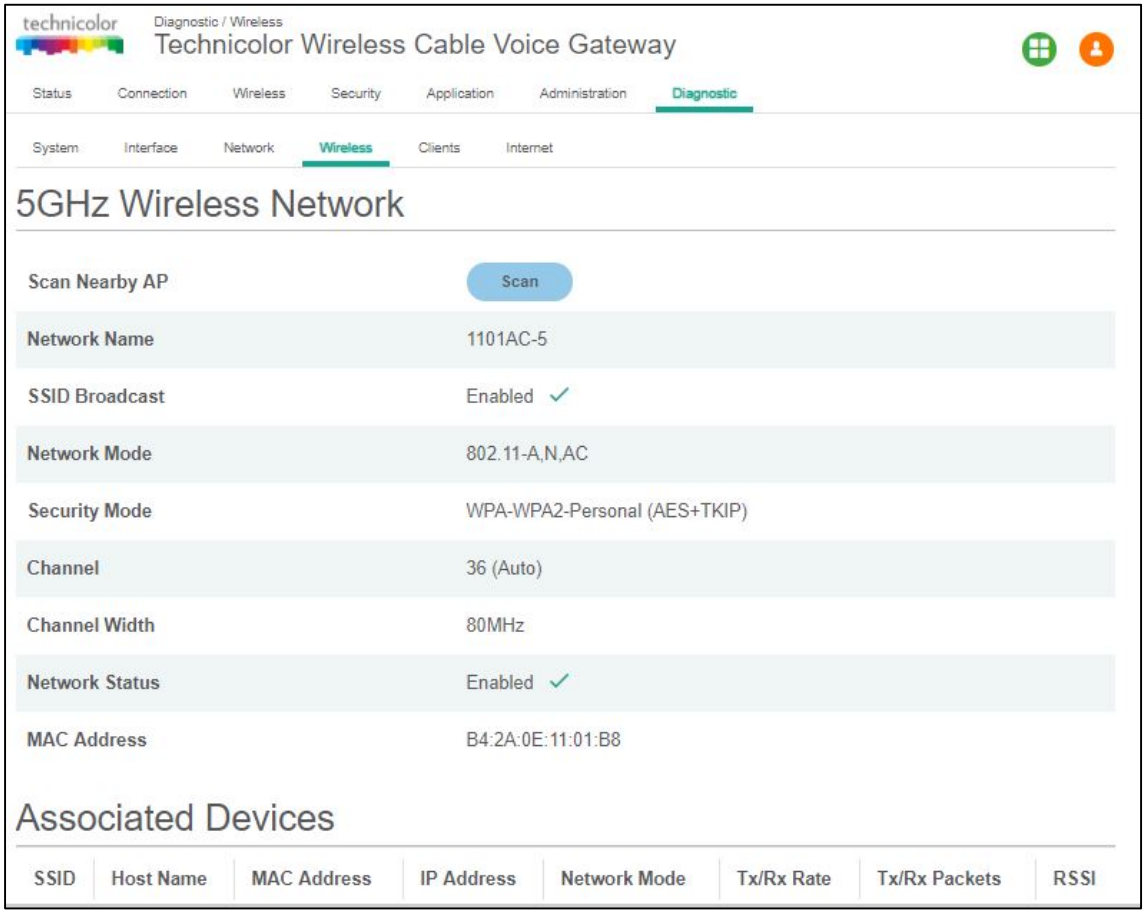


Figure 11.11

11.5 Clients

This page provides data for different clients (LAN and Wi-Fi) connected to the gateway and the details of the network connectivity (IP address, DHCP status, LAN/Wi-Fi and Status) of the connected clients.

The SLAAC Table section in page, displays details about IPv6 Address, the corresponding MAC Address and Reachability States information. Stateless Auto Configuration (SLAAC) is a feature offered by the IPv6 protocol. It allows the various devices attached to an IPv6 network to connect to the Internet using the Stateless Auto Configuration without requiring any intermediate IP support in the form of a DHCP server.

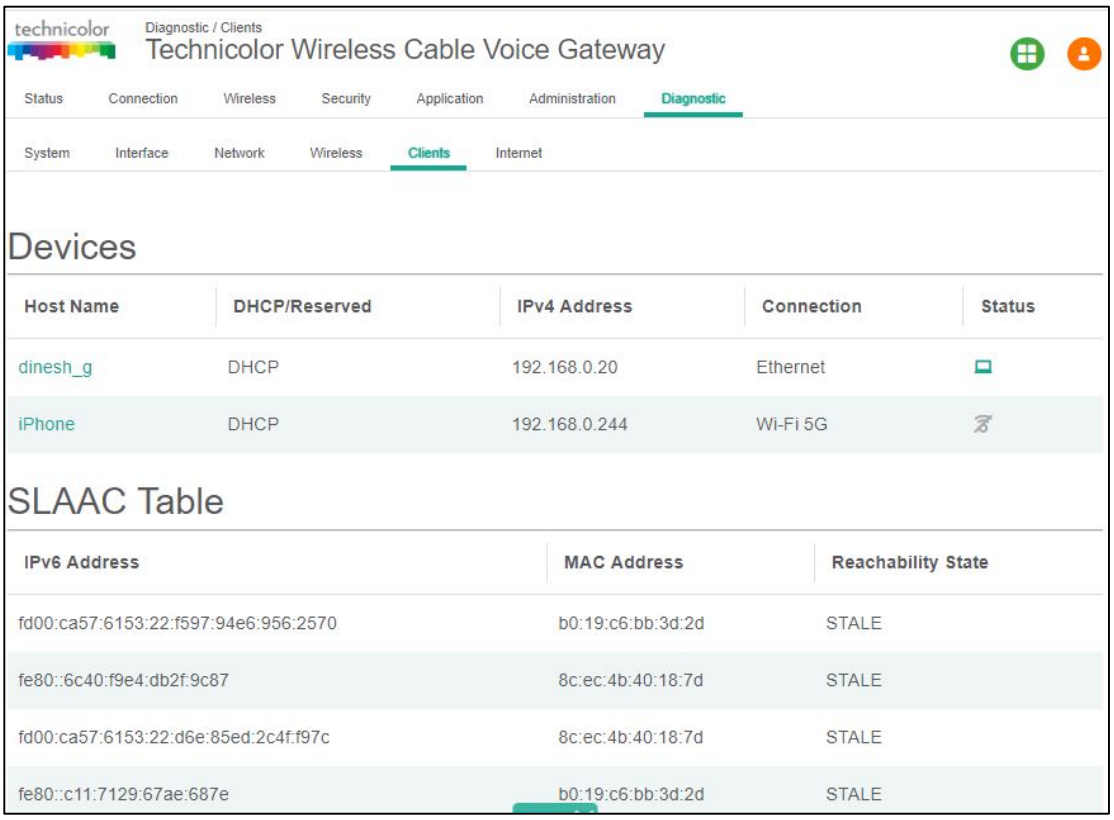


Figure 11.12

11.6 Internet

This page provides the internet traffic information (at IP address level) for the various clients to remote internet addresses including the protocol specific traffic information.

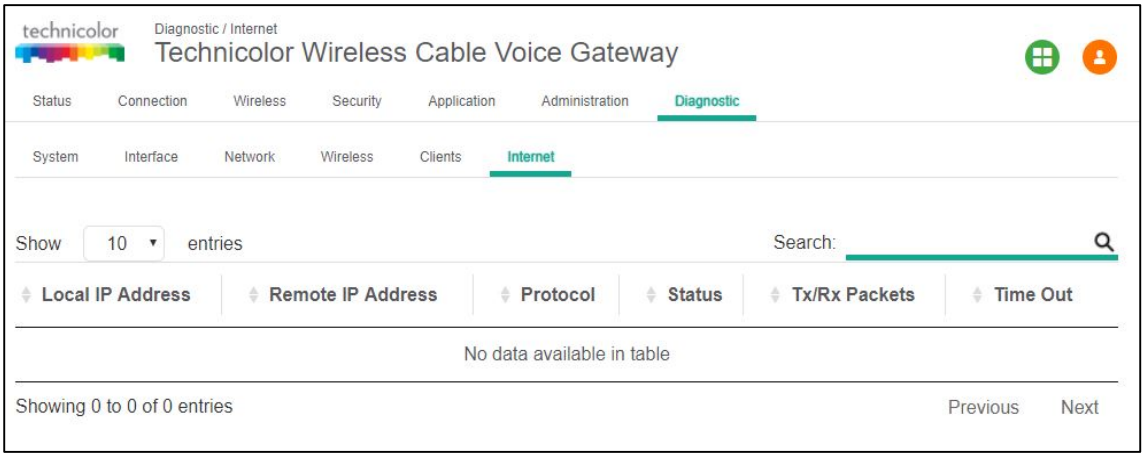


Figure 11.13

12 Mixed mode

8 Gigabit Ethernet ports available on CGA4131 product are primarily used in conjunction with Wi-Fi as primary SSID. In the case of router or bridge modes, all of these ports will be set to router or bridge without independent control over ports. This feature provides the customer with a flexibility to control and configure individual Gigabit Ethernet ports in either bridge or router mode independent of each other. For example, a customer can have port 1 and port 2 in bridge mode while ports 3 to 8 are in router mode.

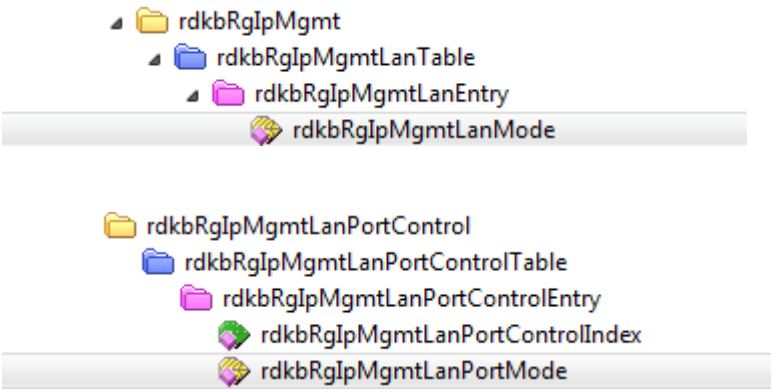
12.1 Procedure to configure Mixed mode

1. Set the **rdkbRgIpMgmtLanMode.32** to Mixed mode (i.e. option 4)
2. There will 8 instances available for **rdkbRgIpMgmtLanPortMode** dedicated to 8 Ethernet ports. (By default all the port will be in router mode).
3. Set the **rdkbRgIpMgmtLanPortMode.x** (x means the Ethernet port i.e. 1, 2...8) to bridge mode as per need.
4. Connect a LAN PC to that port and check for the IP. It should get the public DHCP IP.
5. At the same time, all other ports except x should be in router mode.

12.2 SNMP provisioning for Mixed mode

The following MIBs are used for Mixed mode configuration:

S. No.	MIBs	Description
1	**RdkbRgIpMgmtLanMode**	Each physical LAN port can either be controlled as bridge or router. The rdkbRgIpMgmtLanPortMode MIB only works when RdkbRgIpMgmtLanMode.32=4(Mixed).



technicolor

FEEL THE WONDER

13 Isolation

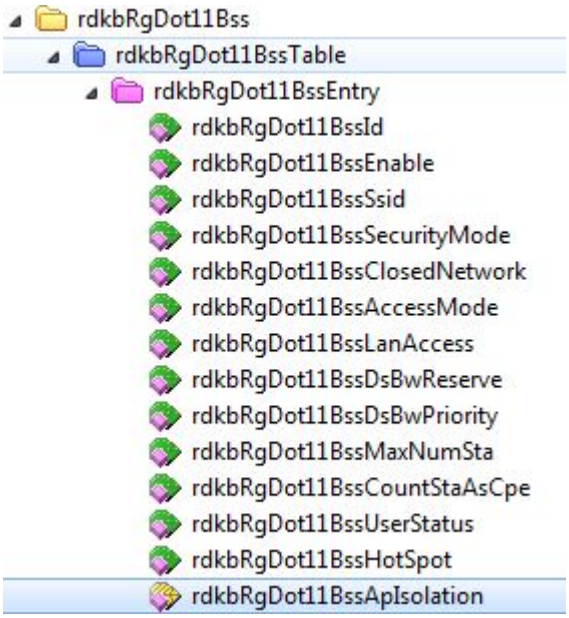
AP Isolation (Access Point Isolation) allows the user to isolate traffic between CPEs on the same Wi-Fi SSID. This allows a measure of security to prevent hackers from accessing other CPEs in a public Wi-Fi environment like Hotspot.

13.1 SNMP provisioning for APIsolation

Isolation for BSSID traffic

Isolation for WLAN-WLAN traffic is controlled via the***rdkbRgDot11BssApIsolation*** MIB object.

S. No.	MIBs	Description
1	***rdkbRgDot11BssApIsolation***	This MIB is written to non-vol and set to disable (0) after a factory reset. disable(0) - No AP Isolation, enable(1) - Enable AP Isolation feature



This is an interface-specific MIB which must be appended with the appropriate interface index of the BSSID that is being configured for isolation.

Index	Interface
10001	**Primary BSSID**
10002	**Secondary BSSID #1**
10003	**Secondary BSSID #2**

10004	**Secondary BSSID #3**
10005	**Secondary BSSID #4**
10006	**Secondary BSSID #5**
10007	**Secondary BSSID #6**
10008	**Secondary BSSID #7**

This means that different BSSIDs may have different isolation settings. For example, it is possible to leave isolation disabled on the primary BSSID, while setting up a secondary BSSID for Guest/Hotspot services that has isolation enabled.

The default setting for this MIB is integer 0 (disabled) for all SSIDs. To enable WLAN-WLAN traffic isolation, set this MIB to 1 (enabled).

This setting is effective in the device configuration file as well as when set via SNMP (If set via SNMP, the setting will persist across device reboots). If SNMP is used, setting ***rdkbRgDot11ApplySettings***to true (1) is required for the change to take effect (as is the case withother***rdkbRgDot11*** MIB settings when set via SNMP).

14 TR-069

TR-069(Technical Report 069) is a method to remotely and securely manage CPE configuration from a central Auto Configuration Server or ACS. The following figure shows a simple and typical deployment layout. The ACS simply needs to be network accessible by the eRouter interface.

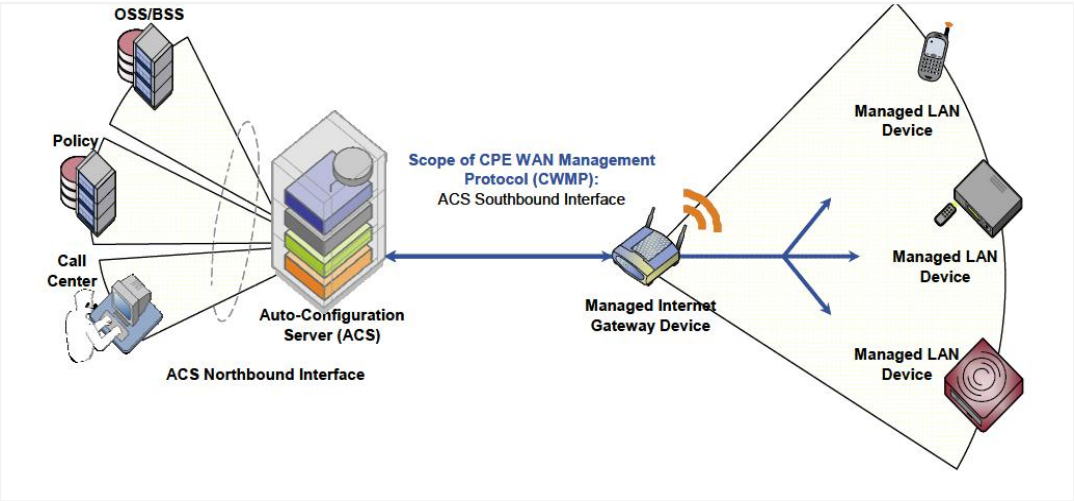


Figure 14.1

To configure TR-069, rdkbTR069ClientMode should be set to enable (1) and rdkbTR069ClientAcsUrl should point to the ACS server (e.g. http://myacs.acs.lab.sa). rdkbTR069ClientAllowDocsisConfig must be set to enable (1) to reconfigure any TR-069 parameters including the ACS URL above.

During the initial device check, the server will populate the rdkbTR069ClientAcsControlPanelUrl, rdkbTR069ClientCrUsername andrdkbTR069ClientCrPassword fields.

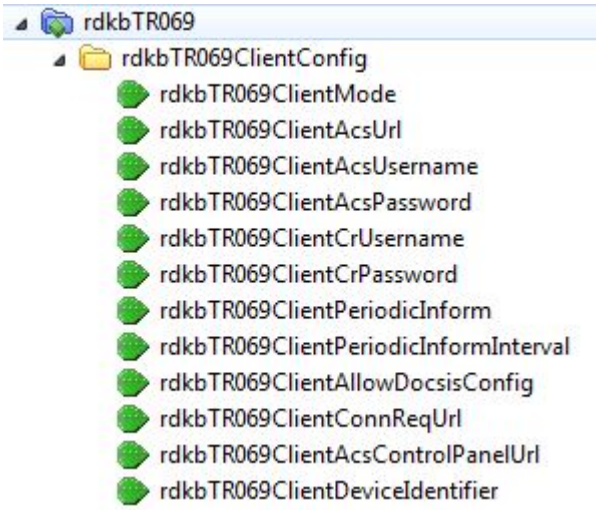
The client device identifier can also be set as either MAC or serial number when registering to the TR-069 server. This affects the Internet Gateway Device, Device Info, Serial Number and Parameter in the TR-069 object model.

14.1 User provisioning forTR-069

The user does not configure TR-069, as it is for remote management by the service operator from the auto configuration server.

14.2 SNMP provisioning for TR-069

S. No.	MIBs	Description
1	**rdkbTR069ClientMode**	**rdkbTR069ClientMode**should be set to enable (1) (TR-069 is disabled by default)
2	**rdkbTR069ClientAcsUrl**	**rdkbTR069ClientAcsUrl**should be set to the ACS IP address. Should be set to enable (1) for TR-069 to be reconfigured (this MIB is enabled by default).
3	**rdkbTR069ClientAcsUsername**	**rdkbTR069ClientAcsUsername**use to set string user name for ACS association.
4	**rdkbTR069ClientAcsPassword**	**rdkbTR069ClientAcsPassword**- set password for ACS association.
5	**rdkbTR069ClientPeriodicInform**	**rdkbTR069ClientPeriodicInform**to enable, inform messages to be sent back to the ACS periodically, refreshing the device data (this MIB is enabled by default).
6	**rdkbTR069ClientPeriodicInformInterval**	**rdkbTR069ClientPeriodicInformInterval**to set the time interval between inform messages in seconds (3600, or one hour by default).
7	**rdkbTR069ClientDeviceIdentifier**	**rdkbTR069ClientDeviceIdentifier**defines the value used to identify this device with the ACS. This value will show up in the ACS server under the Serial Number field.



technicolor

FEEL THE WONDER

15 TR-143

TR-143 defines the CPE data model objects for MSOs to initiate performance throughput tests and monitor data on the IP interface of a CPE using the Diagnostic mechanism defined in TR-069. The diagnostic and monitoring objects provided with TR-143 will assist the operator in determining whether the problem occurs in their network or at customer premises.

Operator needs to run a set of DM's for upload and download diagnostics using either via dmcli command in RG console or via ACS server. These data models can be configured through RG console or using ACS simulator.

```
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.DownloadURL string http://bbc.com
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.Interface string
Device.IP.Interface.1
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.EnablePerConnectionResults bool 1
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.NumberOfConnections uint 3
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.TimeBasedTestDuration uint 5
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.TimeBasedTestMeasurementInterval
uint 6
dmcli eRT setv Device.IP.Diagnostics.DownloadDiagnostics.DiagnosticsState string Requested
```

To get response

```
dmcli eRT getv Device.IP.Diagnostics.DownloadDiagnostics.
```

```
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.UploadURL string http://bbc.com
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.Interface string
Device.IP.Interface.1
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.TestFileLength uint 52428800
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.EnablePerConnectionResults bool 1
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.NumberOfConnections uint 3
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.TimeBasedTestDuration uint 5
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.TimeBasedTestMeasurementInterval uint
6
dmcli eRT setv Device.IP.Diagnostics.UploadDiagnostics.DiagnosticsState string Requested
```

To get response

```
dmcli eRT getv Device.IP.Diagnostics.uploaddDiagnostics.
```

16 Appendix 1: Sample CM Config file

This section provides a sample configuration file used in the CGA 4131.

```
Main
{
       NetworkAccess 1;
       SnmpMibObject iso.3.6.1.4.1.4491.2.2.2.1.1.9.0 Integer 46; /*OID:
.1.3.6.1.4.1.4491.2.2.2.1.1.9.0*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.14 IPAddress 10.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.14 IPAddress 255.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.14 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.14 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.14 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.14 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.14*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.16 IPAddress 12.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.16 IPAddress 255.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.16 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.16 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.16 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.16 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.16*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.18 IPAddress 97.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.18 IPAddress 255.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.18 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.18 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.18 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.18 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.18*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.20 IPAddress 74.84.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.20*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.20 IPAddress 255.255.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.20*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.20 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.20*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.20 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.20*/
       SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.20 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.20*/
```

```
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.20 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.20*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.22 IPAddress 68.66.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.22 IPAddress 255.255.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.22 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.22 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.22 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.22 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.22*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.2.24 IPAddress 108.178.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.2.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.3.24 IPAddress 255.255.0.0; /*OID:
.1.3.6.1.2.1.69.1.2.1.3.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.4.24 String "hsbh5d17t" ; /*OID:
.1.3.6.1.2.1.69.1.2.1.4.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.5.24 Integer 3; /*OID:
.1.3.6.1.2.1.69.1.2.1.5.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.7.24 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.2.1.7.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.2.1.6.24 HexString 0x4000; /*OID:
.1.3.6.1.2.1.69.1.2.1.6.24*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.2.68 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.2.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.4.68 Integer 2; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.4.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.11.68 Integer 6; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.11.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.14.68 Integer 23; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.14.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.15.68 Integer 23; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.15.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.5.68 Integer 1; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.5.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.3.68 Integer 2; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.3.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.7.68 IPAddress 10.4.0.0; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.7.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.8.68 IPAddress 255.255.0.0; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.8.68*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.2.69 Integer 4; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.2.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.4.69 Integer 2; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.4.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.11.69 Integer 6; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.11.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.14.69 Integer 23; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.14.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.15.69 Integer 23; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.15.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.5.69 Integer 1; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.5.69*/
      SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.3.69 Integer 1; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.3.69*/
```

```
	SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.7.69 IPAddress 0.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.7.69*/
	SnmpMibObject iso.3.6.1.2.1.69.1.6.4.1.8.69 IPAddress 0.0.0.0; /*OID:
.1.3.6.1.2.1.69.1.6.4.1.8.69*/
	MaxCPE 5;
	GlobalPrivacyEnable 1;
	BaselinePrivacy
	{
		AuthTimeout 10;
		ReAuthTimeout 10;
		AuthGraceTime 600;
		OperTimeout 10;
		ReKeyTimeout 10;
		TEKGraceTime 600;
		AuthRejectTimeout 60;
		SAMapWaitTimeout 1;
		SAMapMaxRetries 4;
	}
	DsServiceFlow
	{
		DsServiceFlowRef 120;
		QosParamSetType 7;
		TrafficPriority 1;
		MaxRateSustained 1200000000;
		MaxTrafficBurst 24480;
		MinReservedRate 0;
		MinResPacketSize 64;
		ActQosParamsTimeout 0;
		AdmQosParamsTimeout 200;
		MaxDsLatency 0;
	}
	UsServiceFlow
	{
		UsServiceFlowRef 20;
		QosParamSetType 7;
		TrafficPriority 1;
		MaxRateSustained 150000000;
		MaxTrafficBurst 10000000;
		MinReservedRate 0;
		MinResPacketSize 64;
		ActQosParamsTimeout 0;
		AdmQosParamsTimeout 200;
		MaxConcatenatedBurst 16384;
		SchedulingType 2;
		RequestOrTxPolicy 0x00000080;
	}
	MaxClassifiers 35;
	UsPacketClass
	{
		ClassifierRef 2;
		ServiceFlowRef 3;
		RulePriority 1;
		ActivationState 1;
		IpPacketClassifier
		{
			IpProto 17;
			SrcPortStart 2427;
			SrcPortEnd 2427;
```

```
		}
	}
	DsPacketClass
	{
		ClassifierRef 1;
		ServiceFlowRef 103;
		RulePriority 1;
		ActivationState 1;
		IpPacketClassifier
		{
			IpProto 17;
			DstPortStart 2427;
			DstPortEnd 2427;
		}
	}
	UsServiceFlow
	{
		UsServiceFlowRef 3;
		QosParamSetType 7;
		TrafficPriority 4;
		MaxRateSustained 512000;
		MaxTrafficBurst 3044;
		MinReservedRate 0;
		MinResPacketSize 64;
		ActQosParamsTimeout 0;
		AdmQosParamsTimeout 200;
		MaxConcatenatedBurst 1600;
		SchedulingType 2;
		RequestOrTxPolicy 0x00000080;
	}
	DsServiceFlow
	{
		DsServiceFlowRef 103;
		QosParamSetType 7;
		TrafficPriority 2;
		MaxRateSustained 0;
		MaxTrafficBurst 1522;
		MinReservedRate 12000;
		MinResPacketSize 64;
	}
	SnmpMibObject iso.3.6.1.4.1.1429.79.2.2.1.1.0 Integer 0; /*OID:
.1.3.6.1.4.1.1429.79.2.2.1.1.0*/
	SnmpMibObject iso.3.6.1.4.1.1429.79.2.3.2.1.1.32 Integer 1; /*OID:
.1.3.6.1.4.1.1429.79.2.3.2.1.1.32*/
	SnmpMibObject iso.3.6.1.4.1.1429.79.2.2.6.1.1.1.32 Integer 0; /*OID:
.1.3.6.1.4.1.1429.79.2.2.6.1.1.1.32*/
	SnmpMibObject iso.3.6.1.4.1.1429.79.2.2.6.1.1.1.112 Integer 0; /*OID:
.1.3.6.1.4.1.1429.79.2.2.6.1.1.1.112*/
	SnmpMibObject iso.3.6.1.4.1.4526.3.2.3.1.0 Integer 2; /*OID:
.1.3.6.1.4.1.4526.3.2.3.1.0*/
	SnmpMibObject iso.3.6.1.4.1.4526.3.1.1.4.2.0 Integer 2; /*OID:
.1.3.6.1.4.1.4526.3.1.1.4.2.0*/
	VendorSpecific
	{
		VendorIdentifier 0x00265B;
		GenericTLV TlvCode 12 TlvLength 1 TlvValue 0x00;
		GenericTLV TlvCode 46 TlvLength 1 TlvValue 0x00;
	}
```

```
      SnmpMibObject iso.3.6.1.4.1.8595.20.18.2.1.1.3.0 Integer 1; /*OID:
.1.3.6.1.4.1.8595.20.18.2.1.1.3.0*/
      SnmpMibObject iso.3.6.1.4.1.8595.4.1.1.0 Integer 2; /*OID:
.1.3.6.1.4.1.8595.4.1.1.0*/
      SnmpMibObject iso.3.6.1.4.1.4491.2.5.1.1.2.1.2.1 Integer 2; /*OID:
.1.3.6.1.4.1.4491.2.5.1.1.2.1.2.1*/
      SnmpMibObject iso.3.6.1.4.1.4491.2.5.1.1.2.1.2.2 Integer 2; /*OID:
.1.3.6.1.4.1.4491.2.5.1.1.2.1.2.2*/
      SnmpMibObject iso.3.6.1.4.1.4491.2.5.1.1.16.1.1 Integer 1; /*OID:
.1.3.6.1.4.1.4491.2.5.1.1.16.1.1*/
      SnmpMibObject iso.3.6.1.4.1.202.80.3.11.0 Integer 1; /*OID:
.1.3.6.1.4.1.202.80.3.11.0*/
      SnmpMibObject iso.3.6.1.4.1.202.80.21.21.9.0 Integer 2; /*OID:
.1.3.6.1.4.1.202.80.21.21.9.0*/
      SnmpMibObject iso.3.6.1.4.1.1166.1.19.52.1.3.1.1.5.0 Integer 3; /*OID:
.1.3.6.1.4.1.1166.1.19.52.1.3.1.1.5.0*/
      SnmpMibObject iso.3.6.1.4.1.1166.1.19.51.1.5.4.1.14.1.2.32 Integer 2;
/*OID: .1.3.6.1.4.1.1166.1.19.51.1.5.4.1.14.1.2.32*/
      SnmpMibObject iso.3.6.1.4.1.1166.1.19.51.1.5.100.0 Integer 1; /*OID:
.1.3.6.1.4.1.1166.1.19.51.1.5.100.0*/
      SnmpMibObject iso.3.6.1.4.1.4413.2.2.2.1.7.1.4.0 Integer 1; /*OID:
.1.3.6.1.4.1.4413.2.2.2.1.7.1.4.0*/
      SnmpMibObject iso.3.6.1.4.1.2863.205.200.1.10.10.0 Integer 2; /*OID:
.1.3.6.1.4.1.2863.205.200.1.10.10.0*/
      SnmpMibObject iso.3.6.1.4.1.4413.2.2.2.1.1.1.2.0 String "mso" ; /*OID:
.1.3.6.1.4.1.4413.2.2.2.1.1.1.2.0*/
      SnmpMibObject iso.3.6.1.4.1.4413.2.2.2.1.1.1.1.0 HexString 0xC8; /*OID:
.1.3.6.1.4.1.4413.2.2.2.1.1.1.1.0*/
      SnmpMibObject iso.3.6.1.4.1.4413.2.2.2.1.1.1.13.0 Integer 0; /*OID:
.1.3.6.1.4.1.4413.2.2.2.1.1.1.13.0*/
      SnmpMibObject iso.3.6.1.4.1.4413.2.2.2.1.1.1.4.0 Integer 1; /*OID:
.1.3.6.1.4.1.4413.2.2.2.1.1.1.4.0*/
      SnmpMibObject iso.3.6.1.4.1.2863.205.200.1.10.5.0 Integer 2; /*OID:
.1.3.6.1.4.1.2863.205.200.1.10.5.0*/
      SnmpMibObject iso.3.6.1.4.1.2863.205.200.1.10.1.0 Integer 1; /*OID:
.1.3.6.1.4.1.2863.205.200.1.10.1.0*/
      SnmpMibObject iso.3.6.1.4.1.46366.4292.79.2.1.1.1.0 Integer 0; /*OID:
.1.3.6.1.4.1.46366.4292.79.2.1.1.1.0*/
      CoSignerCVCData
0x30820311308201F9A003020102021079623589CC4796804ECA2F55311F7513300D06092A864886F
70D0101050500308197310B3009060355040613025553313930370603550 40A133044617461204F76
6572204361626C652053657276696365204 96E74657266616365205370656369666963174696F6E7
331153013060355040B130C4361626C65204D6F64656D7331363034060355040 3132D444F43534953
204361626C65204D6F64656D20526F6F74204365727469666963617465204175746 86F72697479301
E170D3036303932323030303030305A170D3136303932313233353935395A3059310B300906035504
0613025553111300F060355;
      CoSignerCVCData
0x040A13083830303030303039310F300D060355040B1306444F435349533126302406035504031 31
D436F6465205665726966696361746 96F6E204365727469666963617465308 19F300D06092A864886
F70D010101050003818D0030818902818100A3C952F158553F7642CE624FB6987A9C72A4B2D96DF63
C64A2015D00BDF245179608EF59B898C0864A3DB340C4D8DFFA2B5E23828D9AE87E56C0CB9491A142
740DA1B3DD2CDDE50424BBF13CF070284D91EED0283B49DC276FFBF0A0A221DF150143A2692B8F825
B816248C62FF3C9C4D7BE9023FB00DA24810CB38BB37C92A10203010001A31A301830160603551D25
0101FF040C300A06082B0601;
      CoSignerCVCData
0x0505070303300D06092A864886F70D0101050500038201010 0AE3039569DF0E2FE788291093053C
0A80F2579F0579955C8A2A5C60A969EB6BFF47037D62AAD1DF76E96CEB311EE852CC148B0BE80CBDD
503CA47A1CABD704EC2F8D6A9CBB393D2D45FEE6C2A9A9B74E3E2E505BF3B0707D7F85CB3AA72ED6F
```

```
D3D7F57027B2AD6DE66092494A6FA6398C032C10F00AAD33FCBA8A31E80BC24EB4691B5D01DF6185B
05E6624F46D13E64173B8A1AB4762DC33E1697E495CEC6344F6572D483DD754819C857F2459067E7F
FB41ECA188000743D4D34FEF0BFD6628A45ED20DA8FFE924E79322E9629761804376706ED2DD2BC16
687626E498CAD9531F6F60E7;
       CoSignerCVCData 0x4EE047760CF11415A578444A773AA45324255428EAC19EFD818560;
       /*CmMic 0x64F7AC57DBC68D67D00BCA24DEF7B043*/
       /*CmtsMic 0xEB5928417405FB1BA3E56DD0281A1EC9*/

}
```

17 Appendix 2: Sample bitmask configuration for Web UI

The following MIBs provide read/write access rights per section in the Web UI:

S. No.	MIBs	Description
1	***tchCmWebAccessReadPages***	This MIB specifies the read access rights for every section of the Web UI for all users. The value of (1) means read-only, the value of (0) means no-access. If a write access to a web page is enabled, read access is also enabled.
2	***tchCmWebAccessWritePages***	This MIB specifies the write access rights for every section of the Web UI for all users.The value of (1) means read-write; the value of (0) means read-onlyor no access. If a write access to a web page is enabled, read access is also enabled
3	***tchCmWebAccessHomeReadBitmask***	If this MIB is placed in the CM config file it allows the MSO to disable the Home user read access rights for certain sections of the Web UI that otherwise would be enabled for all users by tchCmWebAccessReadPages.0. So this MIB acts as an override to disable read access to sections of the Web UI specifically for the Home user. Each Bit in the MIB corresponds to a bit in the tchCmWebAccessReadPages MIB. An AND function compares each bit of tchCmWebAccessHomeReadBitmask with tchCmWebAccessReadPages to determine which Web UI Section will have read access rights disabled.
4	***tchCmWebAccessHomeWriteBitmask***	If this MIB is placed in the CM config file it allows the MSO to disable the Home user write access rights for certain sections of the Web UI that otherwise would be enabled for all users by tchCmWebAccessWritePages.0. So this MIB acts as an override to disable write access to sections of the Web UI specifically for the Home user.
5	***tchCmWebAccessAdvancedReadBitmask***	If this MIB is placed in the CM config file it allows the MSO to disable the Advanced user read access rights for certain sections of the Web UI that otherwise would be enabled for all users by tchCmWebAccessReadPages.0. So this MIB acts as an override to disable read access to sections of the Web UI specifically for the Advanced user.

6	***tchCmWebAccessAdvancedWriteBitmask***	If this MIB is placed in the CM config file it allows the MSO to disable the Advanced user write access rights for certain sections of the Web UI that otherwise would be enabled for all users by tchCmWebAccessWritePages.0. So this MIB acts as an override to disable write access to sections of the Web UI specifically for the Advanced user.

The table below shows sample definitionsoftchCmWebAccessHomeWriteBitmask and tchCmWebAccessAdvancedWriteBitmask MIBs for the home user and advance user levels, to enable/disable a web element from the Web UI:

ID	Key	Element type	Page	Bit mask value 8fffffffffeffffffdff (disables certain menu items)	Bit mask value ffffffffffffffffffff (enables all menu items)
0	bridgeRouterMode(0),	section	administration	1	1
1	docsisSignal(1),			0	1
2	docsisStatus(2),	page	docsis status	0	1
3	docsisLog(3),	page	docsis log	0	1
4	--timeUseNtp(4),	section	lan setup	1	1
5	timeZone(5),	section	lan setup	1	1
6	timeDst(6),	section	lan setup	1	1
7	--timeServer(7),	section	lan setup	1	1
8	lanIp(8),	section	lan setup	1	1
9	lanDhcpEnable(9),	section	lan setup	1	1
10	lanDhcpScope(10),	section	lan setup	1	1
11	lanDhcpLeaseTime(11),	section	lan setup	1	1
12	lanDhcpDns(12),	section	lan setup	1	1
13	lanDhcpWins(13),			1	1
14	lanFixedCpe(14),	section	lan setup	1	1
15	wanStaticIp(15),	section	administration	1	1
16	wanDns(16),	section	administration	1	1
17	wanMtu(17),	section	administration	1	1
18	--wanHostDomainNames(18),	section	administration	1	1
19	--resetModem(19),	page	device restart	1	1
20	resetFactoryDefaults(20),	page	factory defaults	1	1
21	backupConfigToPc(21),	page	backup & restore	1	1
22	ddns(22),	page	DDNS	1	1

23	wanBlocking(23),			1	1
24	ipsecPassthrough(24),	section	VPN Passthrough	1	1
25	pptpPassthrough(25),	section	VPN Passthrough	1	1
26	remoteManagement(26),	section	administration	1	1
27	--multicastPassthrough(27),			1	1
28	upnpEnable(28),	section	administration	1	1
29	ipFiltering(29),			1	1
30	macFiltering(30),			1	1
31	portFiltering(31),	page	port filtering	1	1
32	portForwarding(32),	page	port range forwarding	1	1
33	portTriggers(33),	page	port range triggering	1	1
34	dmz(34),	page	DMZ	1	1
35	vpnTermination(35),			1	1
36	--staticRoute(36),			1	1
37	firewallFilterProxy(37),			1	1
38	firewallFilterCookies(38),			1	1
39	firewallFilterJavaApplets(39),			1	1
40	firewallFilterActiveX(40),			1	1
41	firewallFilterPopupWindows(41),			1	1
42	firewallBlockFragmentedPackets(42),			1	1
43	portScanDetection(43),			1	1
44	ipFloodDetection(44),			1	1
45	firewallProtection(45),			1	1
46	--firewallEventLogging(46),			1	1
47	parentalControl(47),	menu	access restrictions	0	1
48	wireless2p4Enable(48),	section	radio settings	1	1
49	wireless2p4ABGNMode(49),	section	radio settings	1	1
50	wireless2p4SSID(50),	section	radio settings	1	1
51	wireless2p4BroadcastSSID(51),	section	radio settings	1	1
52	wireless2p4Channel(52),	section	radio settings	1	1
53	wireless2p4ChannelWidth(53),	section	radio settings	1	1
54	wireless2p4Security(54),	section	wireless security	1	1
55	wireless2p4Wps(55),	group	WPS	1	1
56	wireless2p4Advanced(56),	section	advanced settings	1	1

57	wireless2p4AccessControl(57),	group	MAC filter	1	1
58	wireless2p4Bridging(58),			1	1
59	wireless2p4Wmm(59),	section	QoS	1	1
60	wireless2p4AckEnable(60),	section	QoS	1	1
61	wireless5Enable(61),	section	radio settings	1	1
62	wireless5ABGNMode(62),	section	radio settings	1	1
63	wireless5SSID(63),	section	radio settings	1	1
64	wireless5BroadcastSSID(64),	section	radio settings	1	1
65	wireless5Channel(65),	section	radio settings	1	1
66	wireless5ChannelWidth(66),	section	radio settings	1	1
67	wireless5Security(67),	section	wireless security	1	1
68	wireless5Wps(68),	group	WPS	1	1
69	wireless5Advanced(69),	section	advanced setings	1	1
70	wireless5AccessControl(70),	group	MAC filter	1	1
71	wireless5Bridging(71),			1	1
72	wireless5Wmm(72),	section	QoS	1	1
73	wireless5AckEnable(73),	section	QoS	1	1
74	ping(74),	page	diagnostics	0	1
75	igmpProxy(75),	section	administration	1	1
76	wanConnectionMode(76),	section	administration	1	1
77	docsisWanAbout(77),	section	docsis wan	1	1
78	docsisWanCmState(78),	section	docsis wan	1	1
79	docsisWanDSChannel(79),	section	docsis wan	1	1
80	docsisWanUPChannel(80),	section	docsis wan	1	1
81	voiceState(81),			1	1
82	l2TP(82)			1	1
83	Vlan(83)	section			
84	wirelessGuestNetwork(84)				
85	ippassthrough(85)	page			

Note:

1. Bitmask element type can be "section", "group", "page" or "menu".
2. "wireless2p4Wps" and "wireless5Wps" are grouped, set all to "0" make WPS hide.
3. "wireless2p4AccessControl" and "wireless5AccessControl" are grouped, set all to "0" make Wi-Fi MAC filter hide.

18 Abbreviations and Acronyms

This guide uses the following terms:

Abbreviation	Expansion
AP	Access Point
CTS	Clear To Send protection mode
DTIM Interval	Delivery Traffic Indication Message
PMIP	Proxy Mobile Internet Protocol
RTS	Request to Send Threshold
SNMP	Simple Network Management Protocol
softGRE	Soft Generic Routing Encapsulation
STA	Station- A wireless Station
WDS	Wireless Distribution System
POTD	Password Of The Day

technicolor

FEEL THE WONDER

Technicolor WorldwideHeadquarters

1, Rue Jeanne d'Arc
92443 Issy-les-Moulineaux, France
T +33 (0)1 41 86 50 00
F +33 (0)1 41 86 56 15

technicolor.com