Grandstream Networks, Inc.

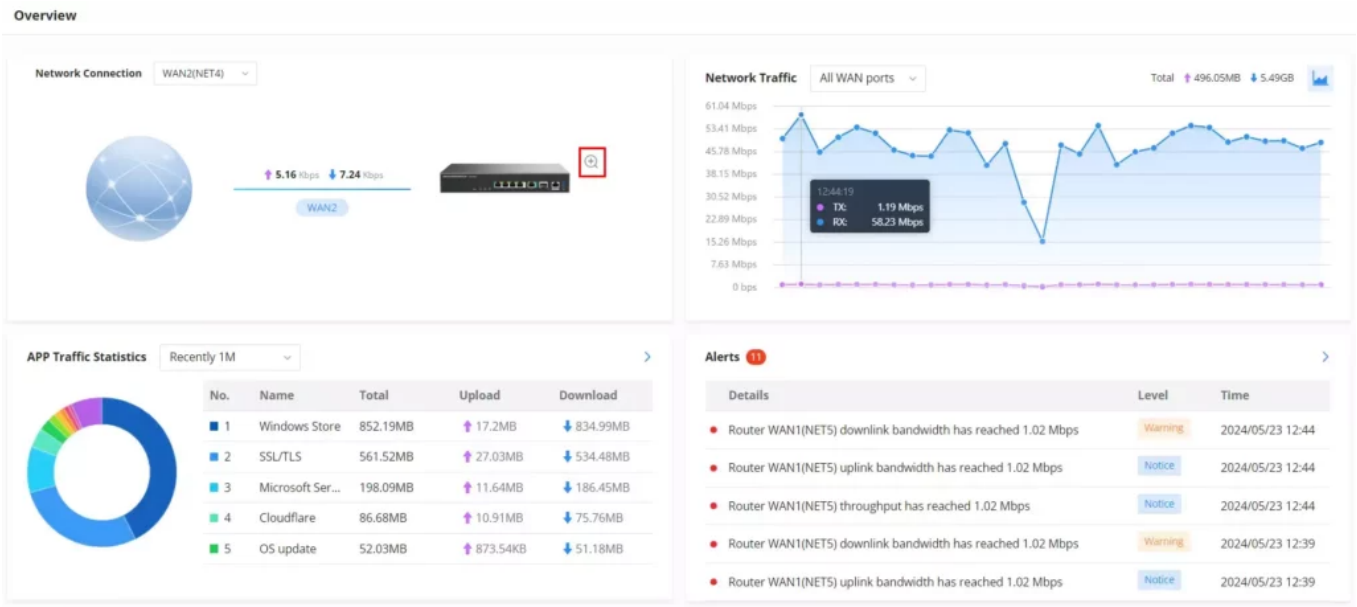
GCC602x - User Manual - Networking

GCC602x - User Manual - Networking

OVERVIEW

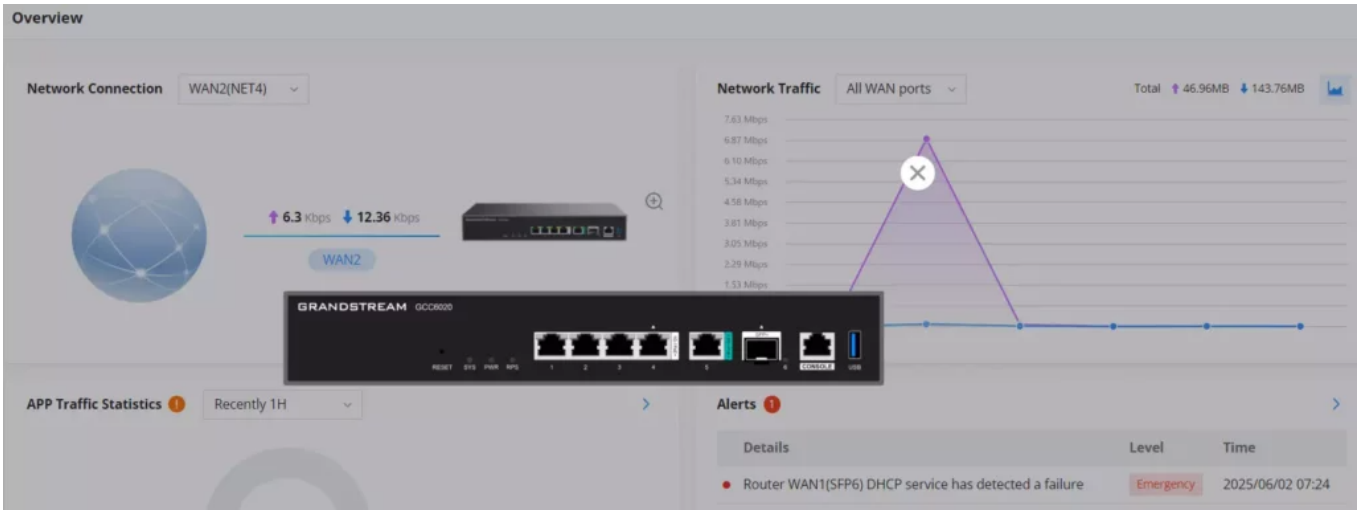
Overview Page

The overview page provides an overall view of the GCC602x's information presented in a Dashboard style for easy monitoring. Please refer to the figure and table below:



Overview Page

- Under **Network Traffic and APP Traffic Statistics**, the users can hover the mouse cursor over the graphs to display more details.
- Under **Network Connection**, the users can click on the "**Zoom icon**" to display a virtual GCC device with live LED indicators.



Overview Page -> Virtual GCC device

Network Connection	Displays the current state of the network connection for the selected WAN port and shows the current upload and download speed.Note: the user can select the WAN port from the drop-down list.

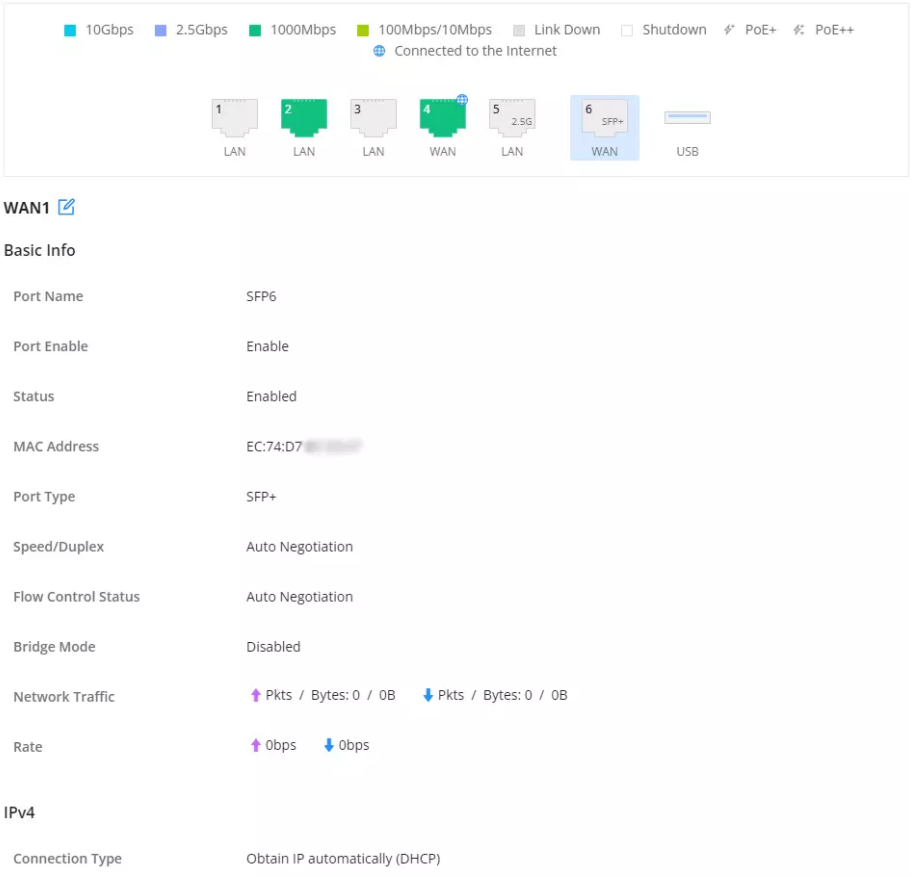
Network Traffic	Shows network traffic in real time.Note: the user can select the WAN port from the drop-down list or select All WAN ports.
Alerts	Shows Alerts General, Important or Emergency with details and time.
APP Traffic Statistics	Displays traffic statistics based on apps usage (%).

Overview page

Port Info

The Port Info page displays an overview of all ports status including the USB Port, Gigabits ports, and SFP ports, indicating the links up with a green color and links down with a grey color, furthermore, the user can click on the port icon to get more info about the select link, refer to the figure below:

Navigate to **Overview -> Port Info**:



Port Info for GCC602x

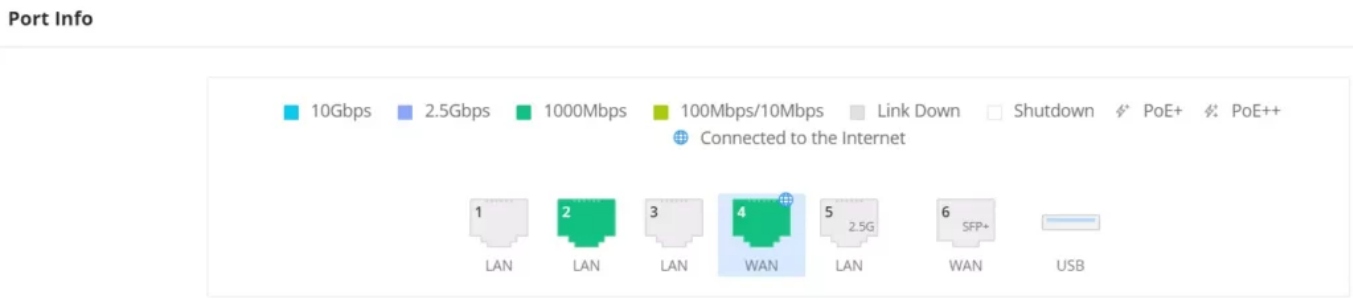
NETWORK SETTINGS

Port Configuration

To access port configuration, please access the user interface of the GCC602x and then navigate to **Network Settings -> Port Configuration**.

- **Port Status**

On the top, you can find the status of all the ports.



Port configuration part 1

Port Color and Symbol Legend

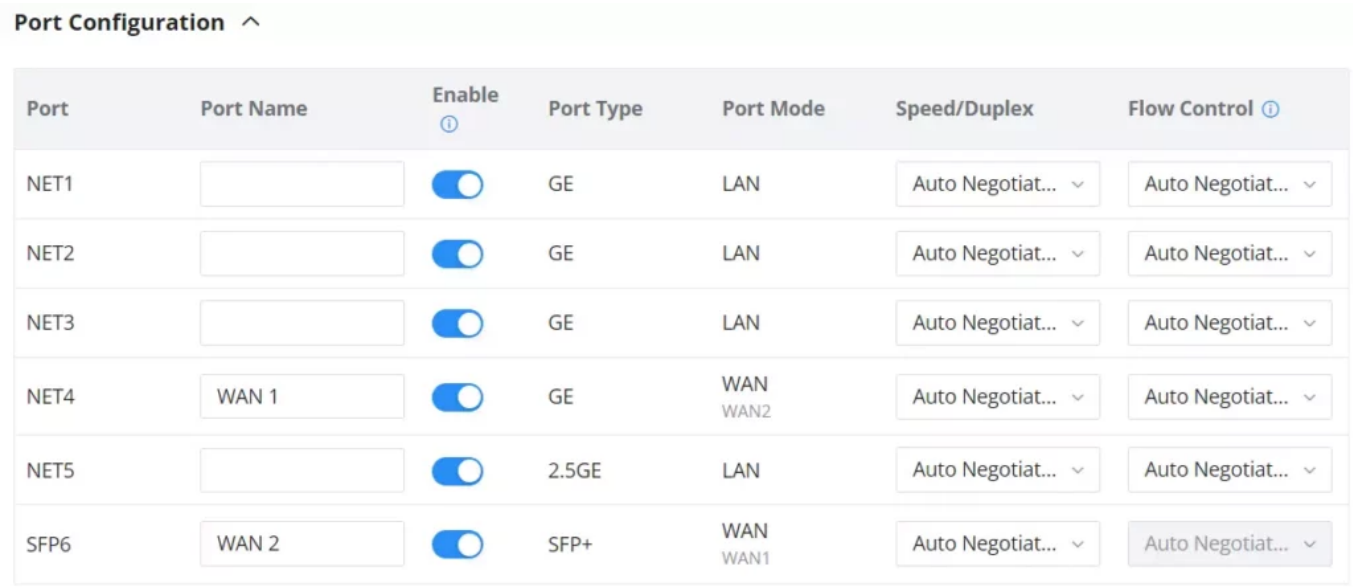
The GCC602x port display uses color-coded indicators and symbols to show the status and characteristics of each physical port:

1. **Blue**: Port speed is 10Gbps (SFP+ ports only)
2. **Purple**: Port speed is 2.5Gbps (applies to SFP ports using 2.5Gbps SFP modules)
3. **Green**: Port speed is 1Gbps
4. **Light green**: Port speed is 100Mbps or 10Mbps
5. **Grey**: The port is physically connected but has no active link
6. **White**: The port has been manually shut down
7. **Globe icon**: Appears on WAN ports when connected to the internet
8. **PoE+ icon**: Indicates the port supports PoE+ (IEEE 802.3at)
9. **PoE++ icon**: Indicates the port supports PoE++ (IEEE 802.3bt for higher power delivery)

- **Port Configuration**

The port configuration page allows the user to configure the settings related to all the ports; this includes the gigabit Ethernet ports as well as the SFP ports. The settings that can be edited include flow control, speed, and duplex mode.

- SFP+ ports support 10G SFP module.
- When the half-duplex mode is selected, traffic control does not take effect.
- When disabling the physical port, all port-based configurations do not take effect.
- At least one LAN port must be enabled; it is not allowed to disable all LAN ports.



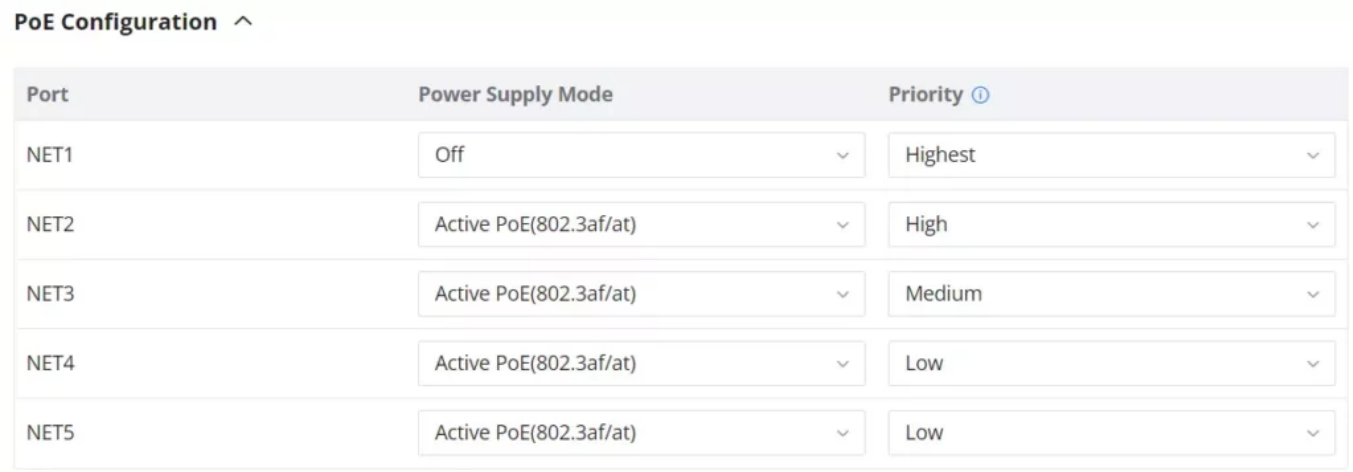
Port configuration part 2

Port	This field indicates the port number.
Port Name	This indicates the port name.
Enabled	Toggle ON or OFF the port. Note: When set to disabled, this physical port is disabled and all port-based configurations do not take effect.
Port Type?	This field indicates the port type.GE: Stands for Gigabit Ethernet SFP: Small form-factor Pluggable
Port Mode	This indicates the port role.LANWAN
Speed/Duplex	In this setting, the user can configure the duplex mode as well as the speed of the port.The duplex setting of the port can be set to: 1000M Full Duplex or 2.5G Full Duplex.When the mode is set to Auto Negotiation, the GCC device will determine based on the settings negotiated with the device connected.
Flow Control	The user can enable or disable flow control using this option.Note: When the setting is set to Auto Negotiation, the GCC device will determine based on the settings negotiated with the device connected.

Port configuration - part 2

- **PoE Configuration**

The user can also control the power limit on each PoE port of the GCC6020.



Port configuration PoE configuration

Port	This field indicates the port number.

Power Supply Mode	This option configures the power supply mode for the port, there are two options:Active PoE(802.3af/at)Off
Priority	Defines the power supply order for PoE ports when power is limited. The available priority levels are: - Highest - High - Medium - LowNote: Power is allocated based on the following rules: * Priority setting takes precedence - ports with higher priority (e.g., Highest) will always receive power before those with lower priority. * If multiple ports share the same priority, the system will prioritize the port with the lowest number (e.g., NET1 before NET5). * Only connected ports are considered - if some ports are disconnected, they are skipped entirely during power distribution.

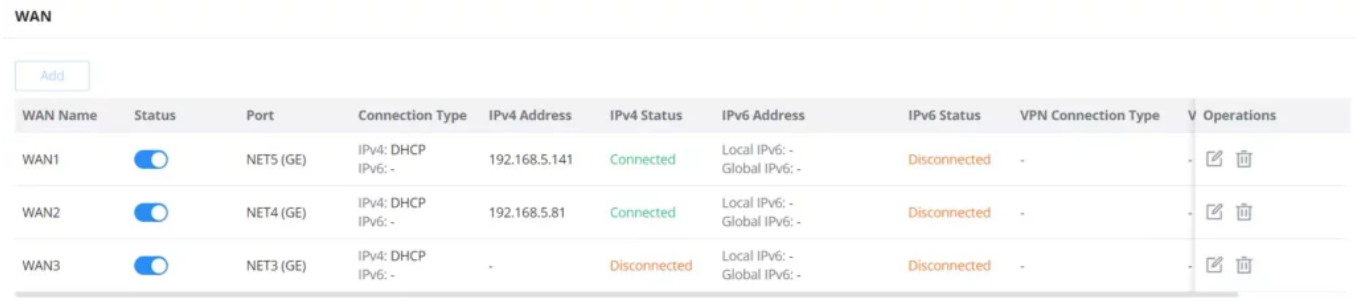
Port configuration - PoE configuration

WAN

WAN ports provide uplink connectivity to the Internet or an upstream network. The WAN ports can be connected to a DSL modem or another router, and they support configuring static IPv4/IPv6 addresses as well as PPPoE.

On supported models, the **USB port** can also be used as a WAN interface by selecting **USB** in the Port field and connecting a compatible **USB 4G/5G dongle** to the device.
For the list of USB 4G/5G dongles that have been tested and verified, refer to **USB 4G/5G Dongle Compatibility** on the Grandstream Documentation Portal.

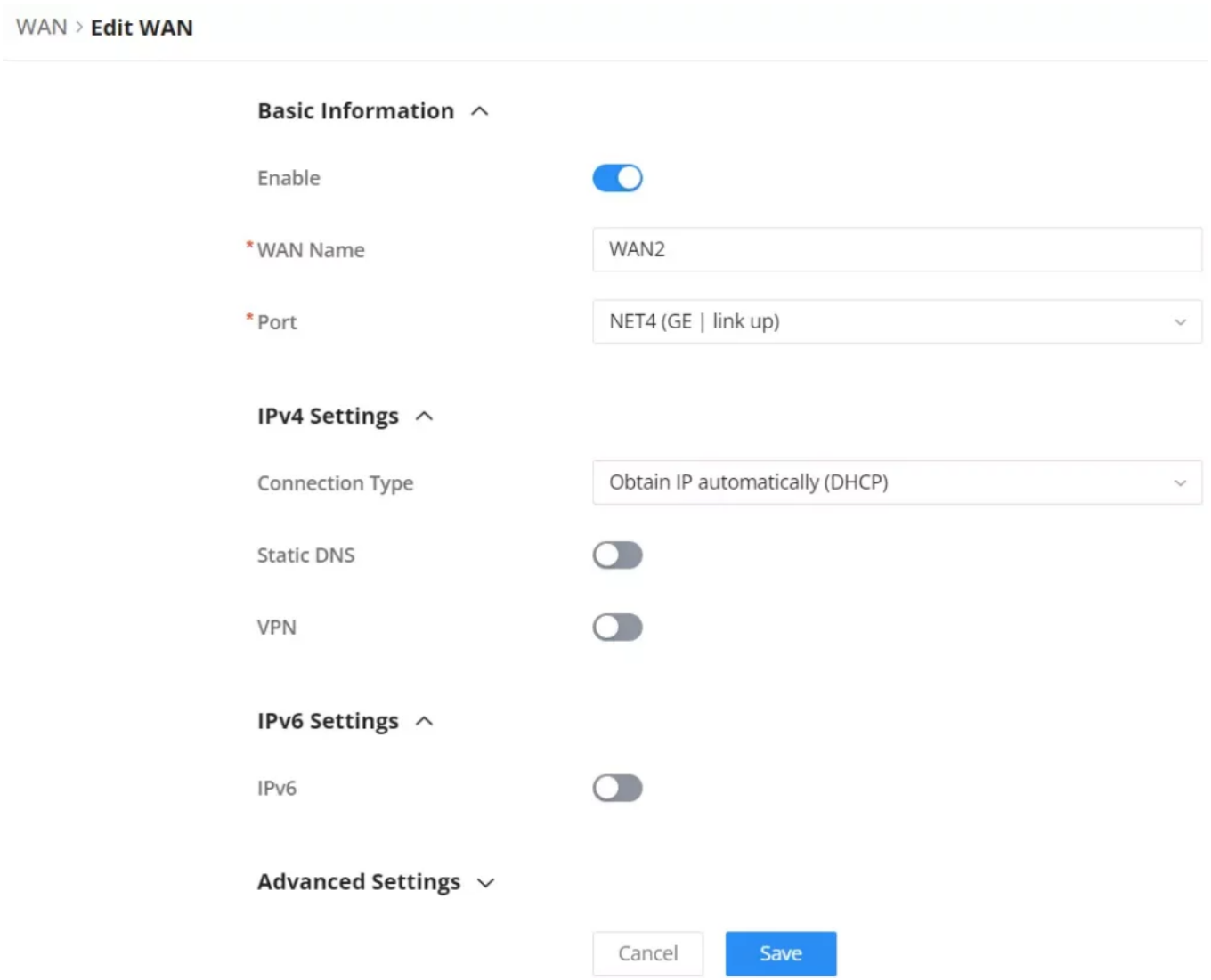
On this page, the user can modify the settings for each WAN port, delete existing WAN ports, or add new WAN ports. Adding a WAN port will reduce the number of available LAN ports. When there is more than one WAN port, load balancing or backup (Failover) can be configured between multiple WAN ports.



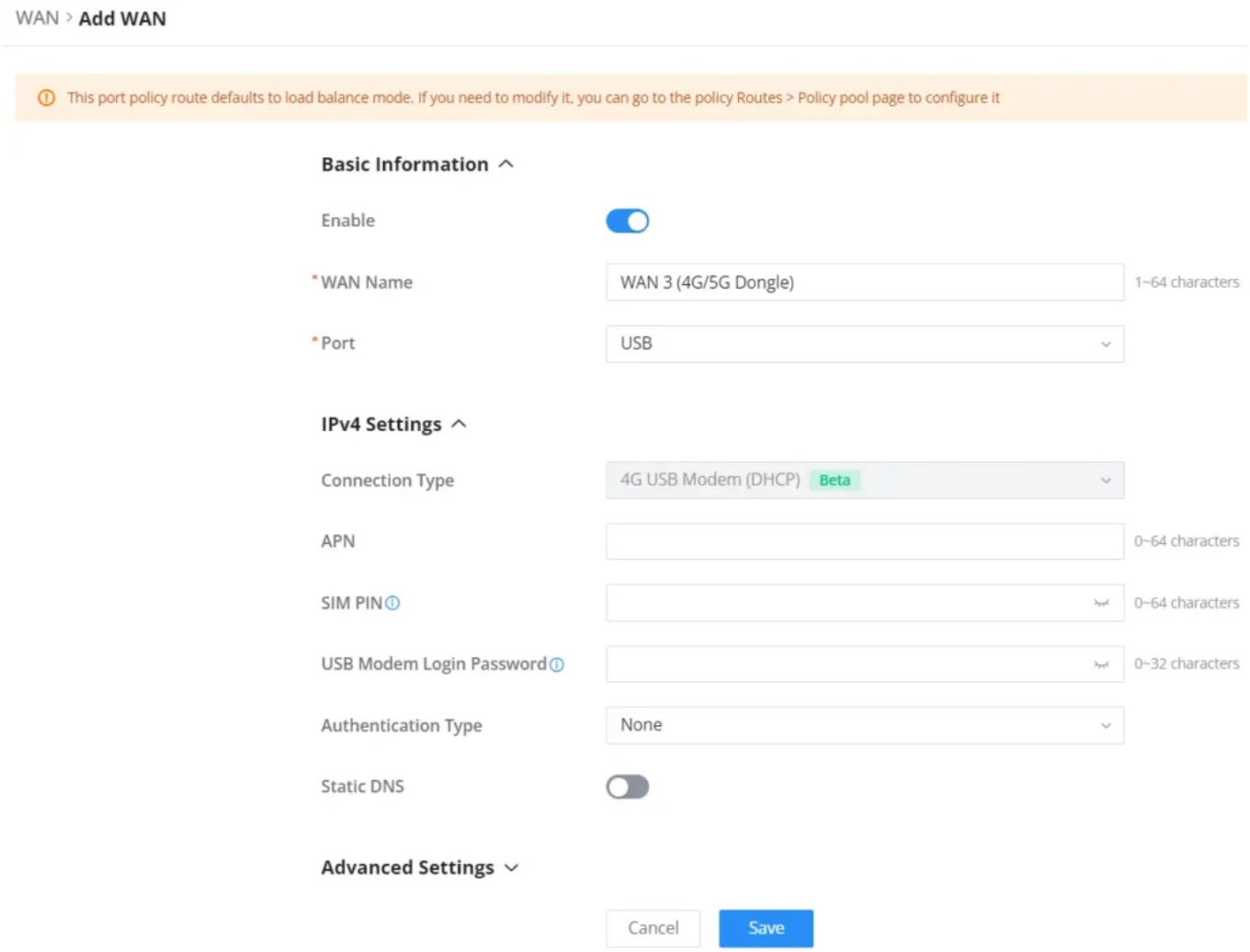
WAN page

- If the WAN is disabled, any configurations dependent on it will remain unaffected and will not be deleted.
- When **USB** is selected as the WAN port, the corresponding port policy route defaults to **load balance** mode. To change this behavior, go to **Routing -> Policy Routes -> Policy Pool** and adjust the policy as required.
- When the GCC is added to the GDMS Networking (Cloud), you can perform a speed test on the WAN ports of the GCC from the GDMS Networking solution. For more details, refer to the GDMS Networking - User Guide.

Click the "**Add**" button to add another WAN port or click on the "**edit icon**" to edit the previously created ones.



Add or Edit WAN if the port is an Ethernet or SFP port



Add or Edit WAN if the port is a USB

Please refer to the following table for network configuration parameters on the WAN port.

Basic Information	
Enable?	Click to enable or disable the WAN
WAN Name	Enter a name for the WAN port
Port	Select from the drop-down list the port to be used as a WAN.
IPv4 Settings	
Connection Type	Obtain IP automatically (DHCP): When selected, the device acts as a DHCP client and acquires an IPv4 address automatically from the DHCP server.Enter IP Manually (Static IP): The user sets a static IPv4 address, IPv4 Subnet Mask, IPv4 Gateway and any Additional IPv4 Addresses needed to reach the web interface, SSH or other services.Internet Access with PPPoE account (PPPoE): The user sets the PPPoE account and password, PPPoE Keep Alive interval, and Inter-Key Timeout (in seconds).4G USB Modem (DHCP): Available when Port = USB. The device obtains its IPv4 address via DHCP from the USB 4G/5G dongle and uses the mobile data parameters (APN, SIM PIN, USB Modem Login Password, Authentication Type) described below.The default setting is "Obtain IP automatically (DHCP)".
Static DNS	Toggle ON or OFF to enable or disable static DNS
APN	Access Point Name provided by the mobile operator for data services. Enter the APN corresponding to the SIM card used in the USB 4G/5G dongle.Note: Displayed only when the Connection Type is 4G USB Modem (DHCP).

SIM PIN	PIN code configured on the SIM card (if any). Enter the correct PIN so that the SIM card can be unlocked and registered on the mobile network.Multiple incorrect PIN attempts can cause the SIM card to be locked (PIN lock). Note: Displayed only when the Connection Type is 4G USB Modem (DHCP).
USB Modem Login Password	Optional login information required by some USB modems / operators for management or authentication. If a password is required, enter it here. If the password is incorrect, the USB modem information may not be obtained completely, although basic Internet access might still work.Note: Displayed only when the Connection Type is 4G USB Modem (DHCP).
Authentication Type	Authentication method used for the mobile data session.None: No additional authentication is performed.PAP: Password Authentication Protocol.CHAP: Challenge-Handshake Authentication Protocol. Select the method required by the mobile operator.Note: Displayed only when the Connection Type is 4G USB Modem (DHCP).
Preferred DNS Server	Enter the preferred DNS Server, ex: 8.8.8.8
Alternative DNS Server	Enter the altenative DNS Server, ex: 1.1.1.1
VPN	Toggle ON or OFF to enable or disable VPN
VPN Connection Type	L2TP: Layer Two Tunneling Protocol (L2TP) is an extension of the Point-to-Point Tunneling Protocol (PPTP) used by internet service providers (ISPs) to enable virtual private networks (VPNs).PPTP: Point-to-Point Tunneling Protocol (PPTP) is a network protocol that enables the secure transfer of data from a remote client to a private enterprise server by creating a virtual private network (VPN) across TCP/IP-based data networks.
Username	Enter the username to authenticate into the VPN server.
Password	Enter the password to authenticate into the VPN server.
Server Address	Enter the IP address or the FQDN of the VPN server.
MPEE Encryption (if PPTP is selected)	When PPTP is chosen as the VPN Connection Type, the user can choose to toggle on or off the MPEE Encryption.
IP Type	Dynamic IP: The IP will be assigned statically using DHCP.Static IP: The IP will be assigned statically.
IP Address	If IP Type is set to Static IP, specifies the static IP address.
Subnet Mask	If IP Type is set to Static IP, specifies the subnet mask.
Default Gateway	If IP Type is set to Static IP, specifies the default gateway.
VPN Static DNS	Enable this option to use the statically assigned DNS server addresses.
Preferred DNS Server	If VPN Static DNS is enabled, specifies the preferred DNS server.
Alternative DNS Server	If VPN Static DNS is enabled, specifies the alternative DNS server.
Maximum Transmission Unit (MTU)	This configures the value of the maximum transmit unit. The valid range for this value is 576 - 1460. The default value is 1430.Note: Please do not change this value unless it's necessary.
IPv6 Settings	
IPv6	Enable this option to use IPv6 on this specific WAN port.
Connection Type	Obtain IP automatically (DHCPv6)Enter the IP manually (static IPv6)Internet Access with PPPoE account (PPPoE): must enabled and configured on IPv4.
IPv6 Address/Prefix Length	When the Connection Type is set to Static IP, the user can enter the static IP address and prefix length.Note: This option appears only when the Connection Type is set to Static IPv6.
IPv6 PD/Prefix Length	When the Connection Type is set to Static IP, the user can enter the IPv6 PD and prefix length.Note: This option appears only when the Connection Type is set to Static IPv6.

Default Gateway	Enter the IP address of the default gatewayNote: This option appears only when the Connection Type is set to Static IPv6.
Static DNS	Enable this option to enter statically assigned DNS.Note: This option appears only when the Connection Type is set to DHCPv6.
Preferred DNS Server	Enter the IP address of the preferred DNS server.Note: This option appears only when the Connection Type is set to Static IPv6.
Alternative DNS Server	Enter the IP address of the alternative DNS serverNote: This option appears only when the Connection Type is set to Static IPv6.
IPv6 Relay to VLAN	Once enabled, relay IPv6 addresses to clients on the LAN side. Note: This function will take effect only "IPv6 Relay from WAN" is enabled on VLAN.
Advanced Settings	
Maximum Transmission Unit (MTU)	Configures the maximum transmission unit allowed on the wan port.When using Obtain IP automatically (DHCP), the valid range that can be set by the user is 576-1500 bytes. The default value is 1500. Please do not change the default value unless you have to.When using PPPoE, the valid range that can be set by the user is 576-1492 bytes. The default value is 1492. Please do not change the default value unless you have to.When IPv6 is enabled on the WAN, the minimum MTU is 1280.
WAN Port MAC Address	Select the MAC address of the WAN port from the drop-down list:Use default MAC address: uses the device's original factory-set MAC address.Use the MAC address of current management PC: clones the MAC address of the device currently managing the GCC device. Use custom MAC address: allows the user to manually input a MAC address.
Use default MAC address	Shows the default MAC address if the option Use default MAC address is selected.
Custom MAC Address	Enters the custom MAC address if the option Use custom MAC address is selected.
Tracking IP Address 1	Configures tracking IP address of WAN port to determine whether the WAN port network is normal.Note: to modify this configuration item, enter a stable and pingable host IP. If the IP address of the host entered is unstable or cannot be pinged, a network exception may be caused.
Tracking IP Address 2	Add another alternative address for Tracking IP Address
VLAN Tag	Toggle ON or OFF to enable or disable VLAN Tag
VLAN Tag ID	Enter the VLAN Tag ID with the priorityNotes:* Priority is 0~7 with 7 being the highest priority. Default is 0.* Multiple WANs can use the same VLAN ID.
Bridge mode	oggle ON to enable Bridge Mode, which allows the WAN port to act as a bridge between specific VLANs.
VLAN Tag ID/Port/Priority	* Enter the VLAN Tag ID and assign a port for traffic bridging. * Set the priority for the VLAN traffic (0-7), where 7 represents the highest priority.
Multiple Public IP Address	Toggle ON or OFF to enable or disable Multiple Public IP AddressNote: Please use with Port Forward function, so that you can access to router via public IP address.
Public IP Address	Enter a public IP addressNote: Click on "Plus" or "minus" icons to add or delete public IP addresses.

WAN Settings

Bridge Mode

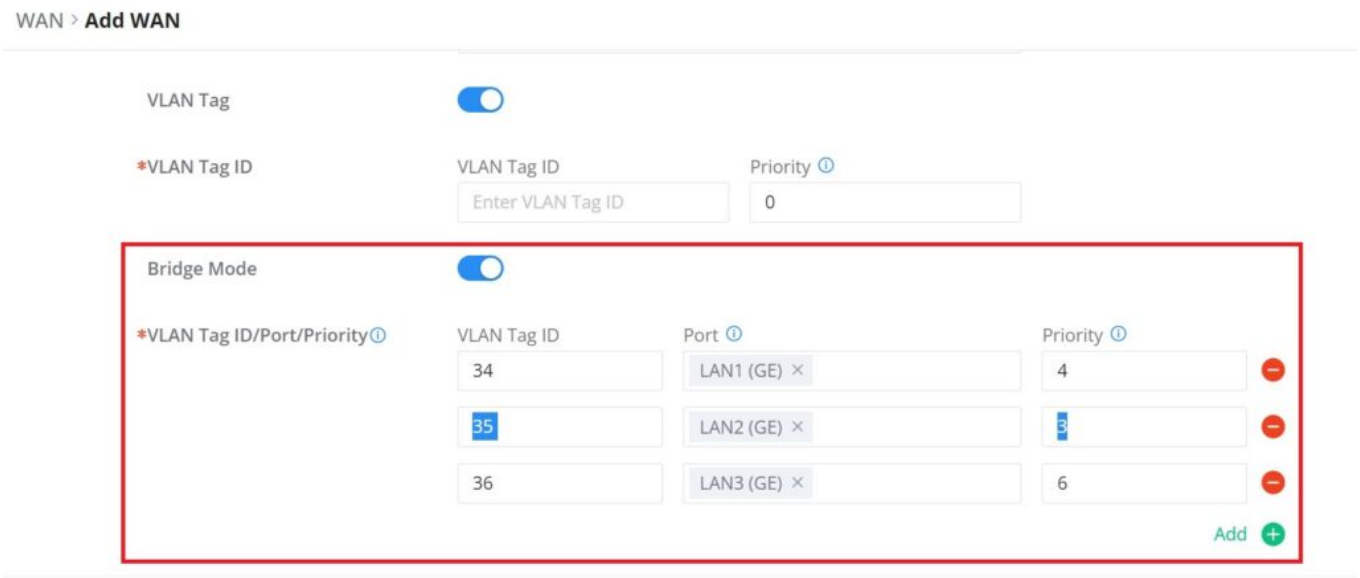
Overview:

Bridge Mode allows VLAN-tagged WAN traffic to be mapped directly to specific LAN ports, enabling seamless passthrough of ISP-provided services. This is commonly used in multi-service deployments such

as **Triple Play** setups, where Internet, IPTV, and VoIP services are separated using VLANs and assigned to designated ports.

Users can configure multiple VLAN Tag IDs, assign each to a port, and define priority levels (0-7) for QoS handling. Each port can only be bridged by one WAN interface.

Navigation:
Network Settings -> WAN -> Add/Edit WAN -> Scroll to **Bridge Mode** under Advanced Settings.



Bridge Mode

Field	Description
Bridge Mode	Toggle to enable bridging of VLAN-tagged traffic to LAN ports.
VLAN Tag ID	Enter the VLAN ID provided by the ISP for service separation.
Port	Select the LAN/SFP port to map the VLAN traffic. Each port can only be assigned once.
Priority	Set traffic priority (0-7), where 7 is the highest. Used for QoS handling.
Add / Remove	Add multiple VLAN-to-port mappings or remove existing ones.

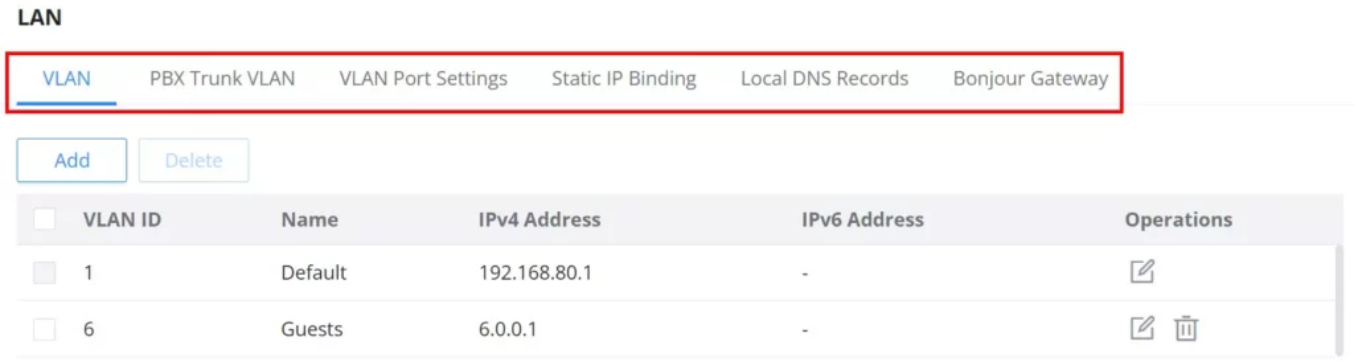
Bridge Mode

Notes:

- This feature is typically configured based on ISP instructions.
- Ensure VLAN IDs and port assignments align with your service provider's requirements.
- Priority settings optimize traffic flow for services like VoIP or IPTV.

LAN

To access the LAN configuration page, log in to the GCC6020 WebGUI and go to **Network Settings -> LAN**. VLAN configuration, such as adding VLANs or setting up a VLAN port, can be found here on this page, as well as the ability to add Static IP Bindings, local DNS Records, and Bonjour Gateway.



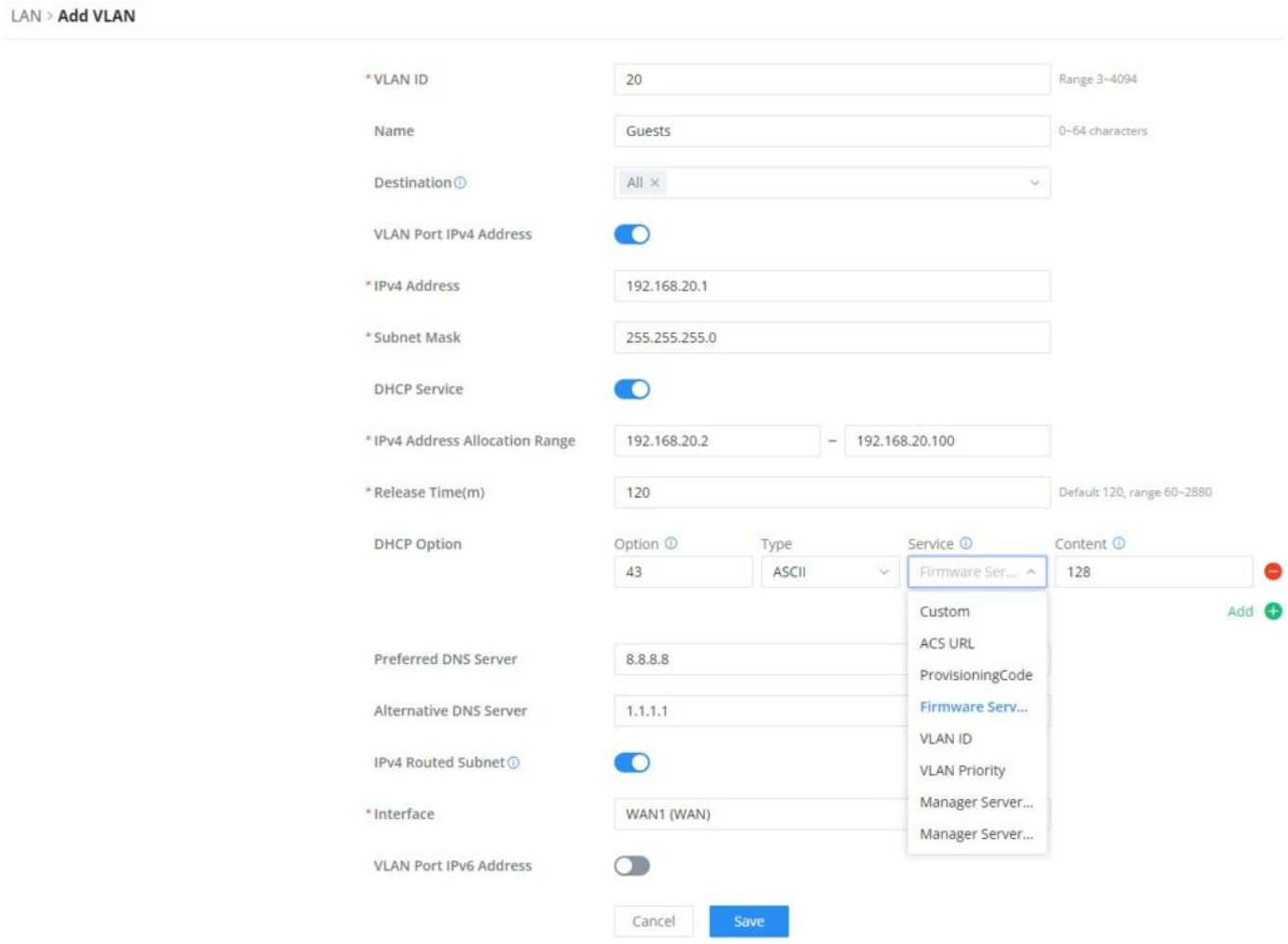
LAN configuration

VLAN

GCC602x integrates VLANs to enhance security and add more functionalities and features. VLAN tags can be used with SSIDs to separate them from the rest. Also, the user can allow these VLANs only on specific LANs for more control and isolation, and they can be used as well with policy routing.

- **Add or Edit VLAN**

To add or edit a VLAN, navigate to **Network Settings -> LAN**. Click the "**Add**" button or click the "**Edit**" icon.



Add or Edit VLAN

VLAN ID	Enter a VLAN IDNote: VLAN ID range is from 2 to 4094.
Name	Enter the VLAN name

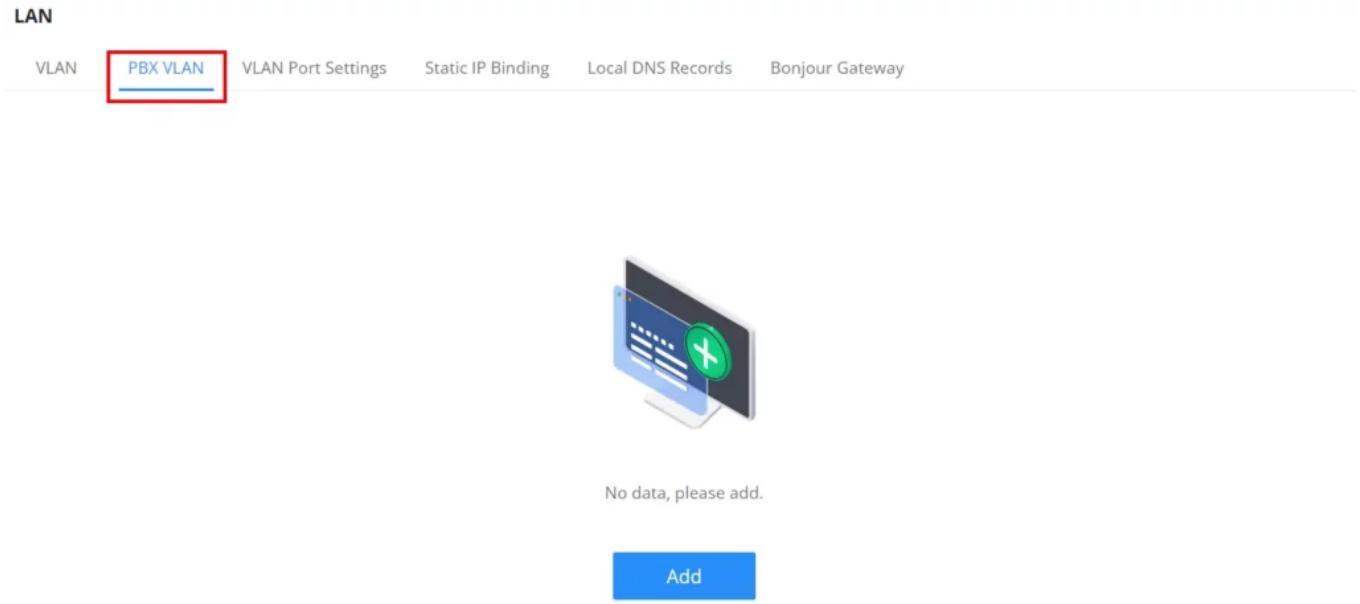
Forwarding Destination Group	By default, "All" is selected, and the interfaces set in the default rule of the policy pool (WAN or VPN) are selected by default and cannot be unchecked here, and subsequent new interfaces are automatically included.
Enable Captive Portal	Toggle this option to activate Captive Portal authentication for devices connected through this VLAN. It is not recommended to enable this alongside SSID-Portal authentication. If using a GWN AP with firmware version 1.0.25.20 or later, ensure to configure ByPass for the AP under Captive Portal > Policy to avoid conflicts.
Captive Portal Policy	Select the Captive portal policy from the drop-down list or click on "Add Policy " to add a new one.
VLAN Port IPv4 Address	
VLAN Port IPv4 Address	Enter IPv4 Address
IP Address / Mask	Enter the subnet IP and the subnet mask.
DHCP Service	Toggle the button to enable DHCP service on this VLAN.
DHCP Server	From the list select a DHCP server, or click "Add" to create a new one.Note: 2 DHCP servers maximum can be selected for a single VLAN.
IPv4 Routed Subnet	Toggle the button to the hosts on this VLAN to access Internet throught the WAN interface.
Interface	Select the WAN interface to allow the hosts of the VLAN to access from.
VLAN Port IPv6 Address	
IPv6 Address Source	Select from the drop-down list the WAN port
Interface ID	Toggle ON or OFF the interface ID
Customize Interface ID	Enter the interface ID
IPv6 Preferred DNS Server	Enter the IPv6 Preferred DNS Server
IPv6 Alternative DNS Server	Enter the IPv6 Alternative DNS Server
IPv6 Relay form WAN	Once enabled, clients will get IPv6 addresses directly from the WAN side. Note: This function will take effect only "IPv6 Relay to VLAN" is enabled on the WAN side.
IPv6 Address Assignment	Select from the drop-down list the IPv6 address assignmentDisableSLAACStateless DHCPv6Stateful DHCPv6

Add/edit VLAN

PBX VLAN

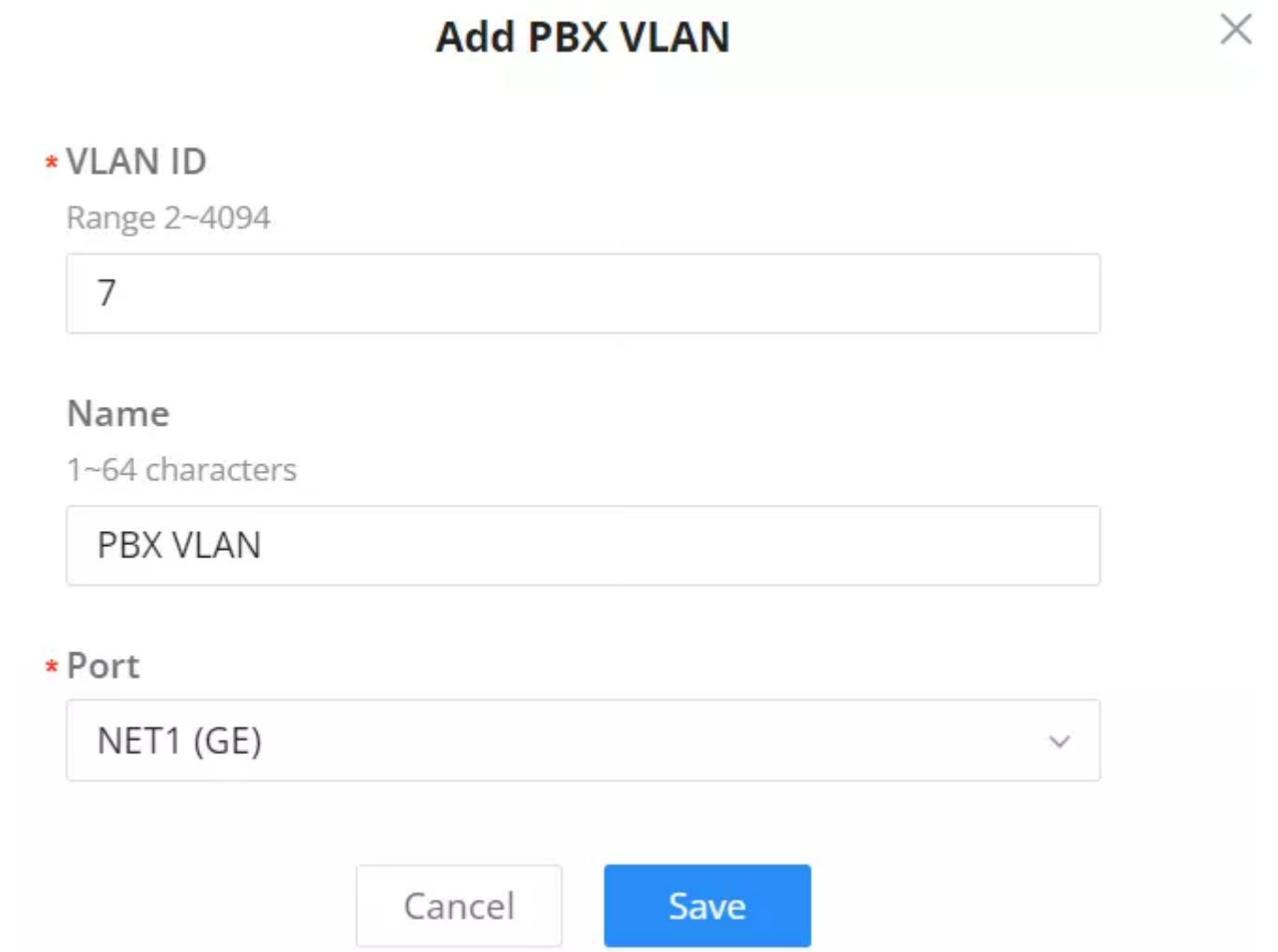
PBX VLAN allows creating an interface to connect the GCC device to an ITSP through a SIP Trunk. The interface is segregated using a VLAN; however, no VLAN tagging/untagging is occurring beyond the interface. When creating a PBX VLAN, choose the VLAN ID, then specify the port of the PBX VLAN. On the PBX module, specify the IP address and mask for the interface, then specify the gateway. These options should be provided by the ITSP and set statically on the interface. For more information, please refer to the following sections of the GCC PBX documentation to learn how to configure a SIP trunk using PBX VLAN at the following link.

To add a PBX VLAN, navigate to the **Networking module -> Networking Settings -> LAN page -> PBX VLAN tab**. Click the "**Add**" button to add a PBX VLAN.



PBX VLAN

Specify a VLAN ID, name and then select the port as shown below:

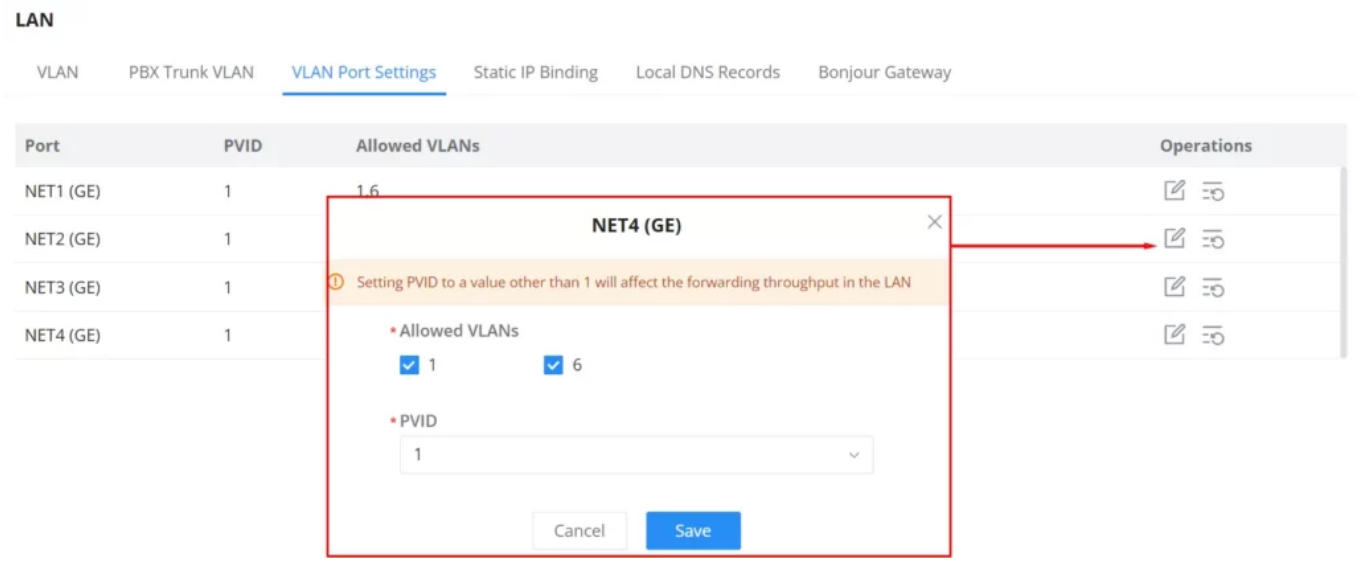


Add PBX VLAN

VLAN Port Settings

The user can use LAN ports to allow only specific VLANs on each LAN port, and in case there are more than one VLAN, then there is an option to choose one VLAN as the default VLAN ID (PVID or Port VLAN

Identifier). Click on to edit the VLAN Port Settings or click the button to delete that configuration and bring back the default settings, which is by default VLAN 1.



VLAN Ports

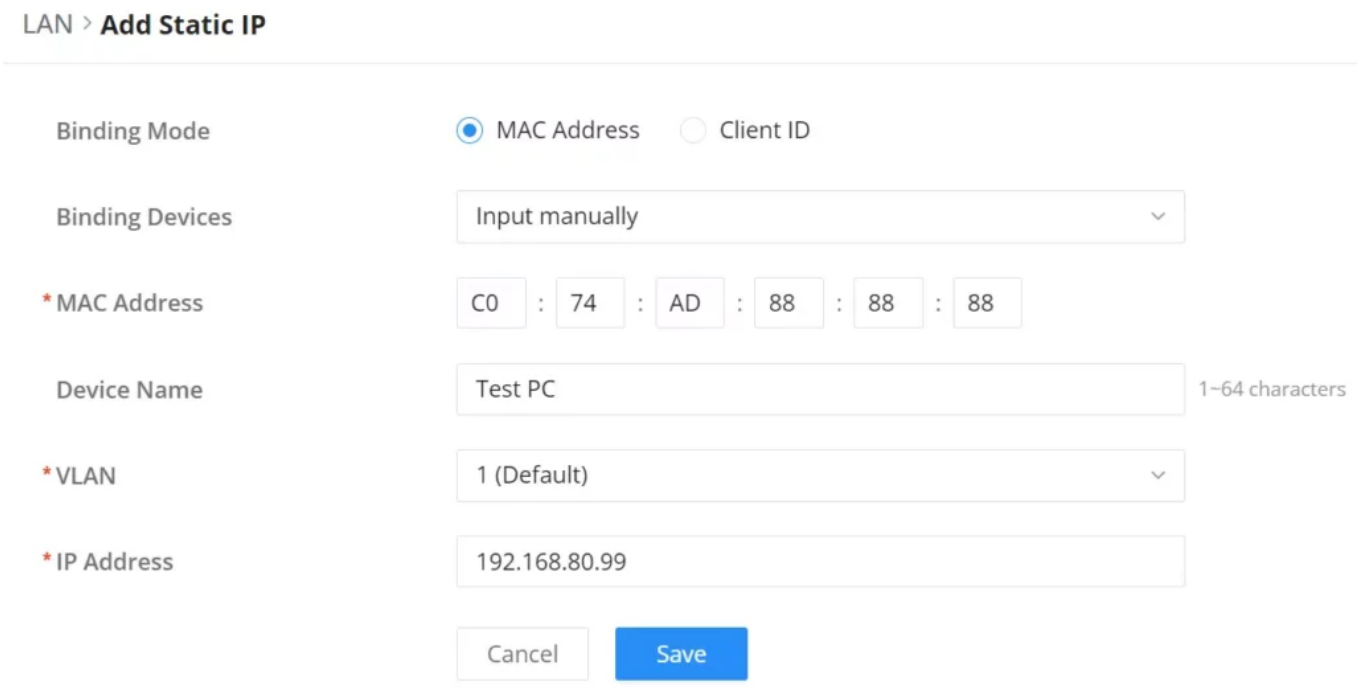
Allowed VLANs	Choose the VLANS to be allowed on this port.
PVID	Select the Port VLAN Identifier or the default VLAN ID

VLAN Port Settings

Static IP Binding

The user can set static IP binding to devices in which the IP address will be bound to the MAC address. Any traffic that is received by the router that does not have the corresponding IP address and MAC address combination will not be forwarded.

To configure Static IP Binding, please navigate to **Network Settings -> LAN -> Static IP Binding**, refer to the figure and table below:



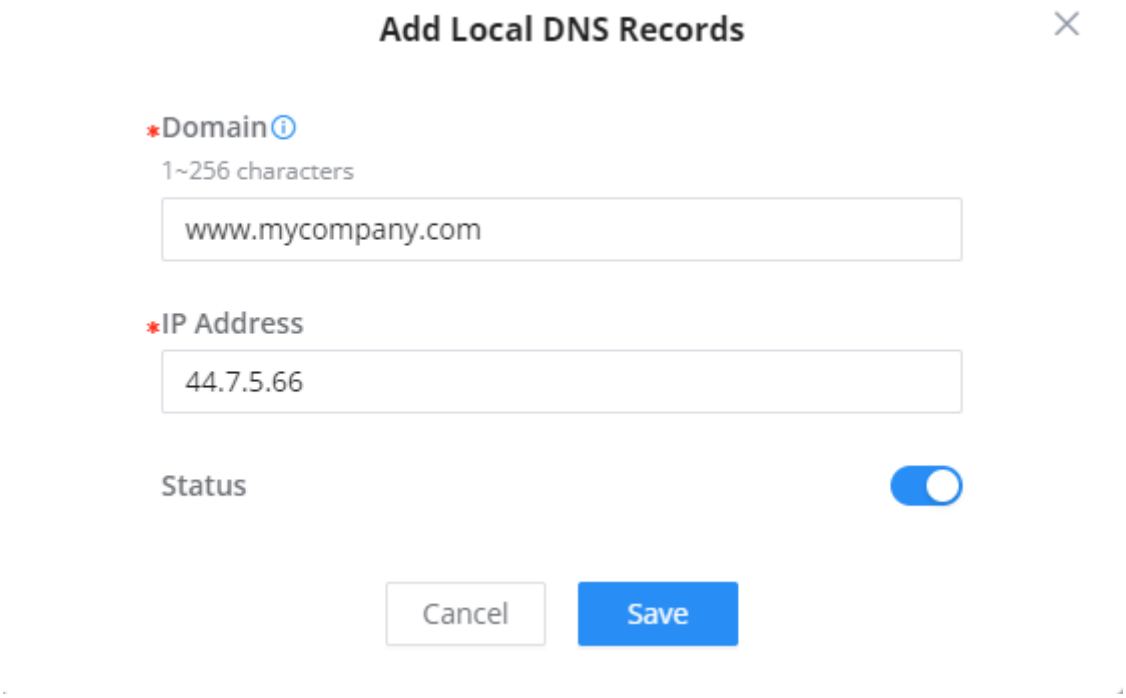
Static IP Binding

Binding Mode	select the binding mode, either using the client MAC address or Client ID.
Binding Devices	Select the device MAC address from connected devices list.Note: only available bindind mode is set to MAC Address.
Client ID Type	Select the client ID type, either based on:MAC AddressASCIIHexNote: only available bindind mode is set to Client ID.
MAC Address	Enter the MAC AddressNote: only available bindind mode or Client ID Type is set to MAC Address
ASCII	Enter the ASCIINote: only available Client ID Type is set to ASCII
Hex	Please enter XX:XX:XX:XX format or a valid even-digit hexadecimal number string, the first two digits need to enter the type value.Note: only available Client ID Type is set to Hex
Device Name	Enter a name for the device
VLAN	Select the VLAN ID to assign to the bound device. This ensures the device operates under the configured VLAN policies.
IP Address	Enter the static IP address to assign it to the selected device.

Static IP Binding

Local DNS Records

Local DNS Records is a feature that allows the user to add DNS records into the GCC602x, which can be used to map the domain name to an IP address. This feature can be used when the user needs to access a specific server using a domain name instead of an IP address, and they do not want to include the entry in public DNS servers. To add a local DNS record, please navigate to **Network Settings -> LAN -> Local DNS Records**, then click "**Add**"



Add Local DNS Records

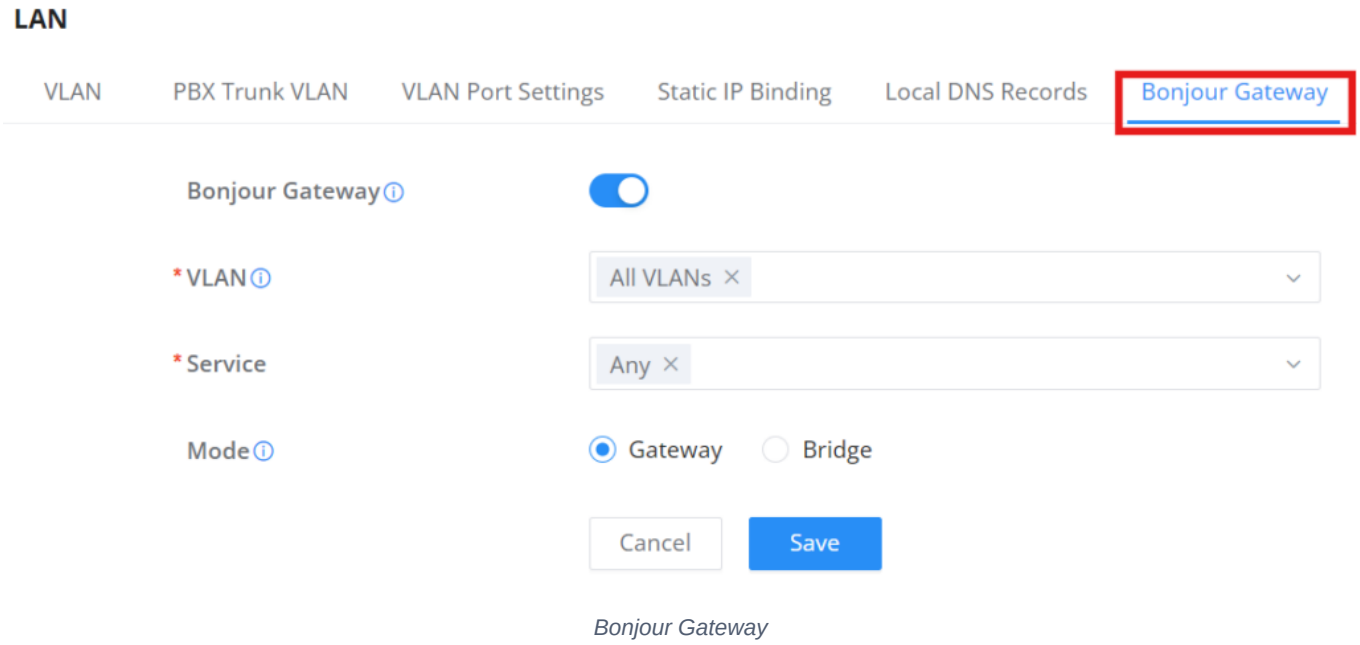
- Enter the domain name in "**Domain**"
- Then, enter the IP address to which the domain name will be mapped to.
- Toggle on the "**Status**" for the mapping to take effect.

Bonjour Gateway

The Bonjour service is a zero-configuration network that enables the automatic discovery of devices and services on a local network. For example: it can be used on a local network to share printers with Windows(R) and Apple(R) devices.

Once enabled, Bonjour services (such as Samba) can be provided to Bonjour-supporting clients under multiple VLANs. Once enabled, configure the services of the VLANs and proxies that need to intercommunicate.

To start using Bonjour Gateway, toggle **ON** the service first, then select the VLAN, the services, and the operational mode as shown below:



Bonjour Gateway

- **Bonjour Gateway**: Toggle to enable or disable mDNS discovery across VLANs.
- **VLAN**: Select the specific VLANs that require intercommunication.
- **Service**: Select the specific services to be discovered (e.g., AirPlay, AirPrint, Chromecast, Samba).
- **Mode**: Choose how the router handles the discovery packets between networks.

Mode	Description
Gateway	The router proxies mDNS packets and rewrites the source IP address to the router's gateway IP.
Bridge	The router transparently forwards mDNS packets without modifying the packet content.

MGMT

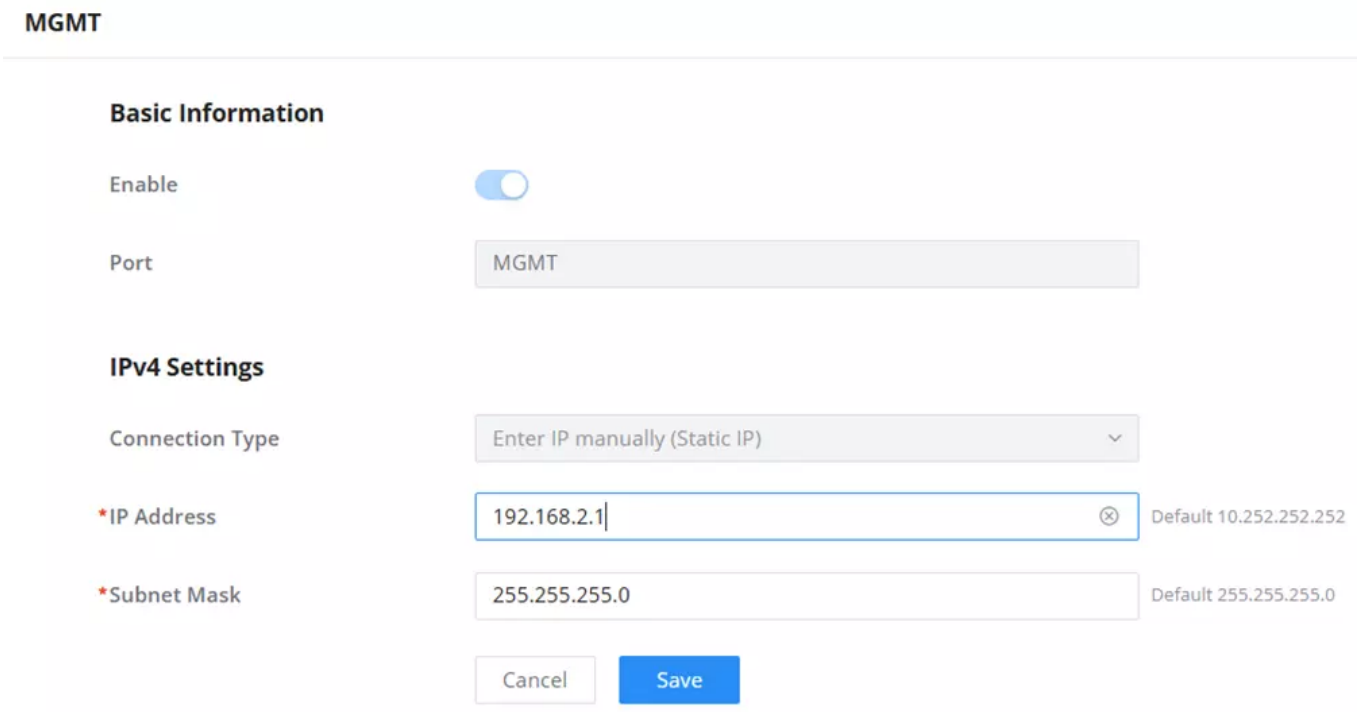
The **MGMT (Management) port** is a dedicated interface used exclusively for system administration. It operates independently from LAN/WAN traffic and is not affected by VLAN configurations or routing rules. This port provides a secure, isolated path for direct device access, ideal for local management, emergency troubleshooting, and out-of-band configuration.

When enabled, the MGMT port allows access to the Web UI or CLI even if the main network is down. This ensures that administrators can always reach the device regardless of system status.

Default MGMT IPv4 settings:

- **IP Address:** 10.252.252.252
- **Subnet Mask:** 255.255.255.0

To configure the MGMT port, navigate to **Network Settings -> MGMT** from the left sidebar menu in the Web UI.



MGMT

Available Settings:

- **Enable**: Activates or disables the MGMT port.
- **Port**: Displays the port label (MGMT).
- **Connection Type**: Defines the method for assigning an IP address to the MGMT port.
- **IP Address / Subnet Mask**: Defines the IP address/Subnet Mask for accessing the MGMT port.

The MGMT port feature is only available on the GCC6021 model.

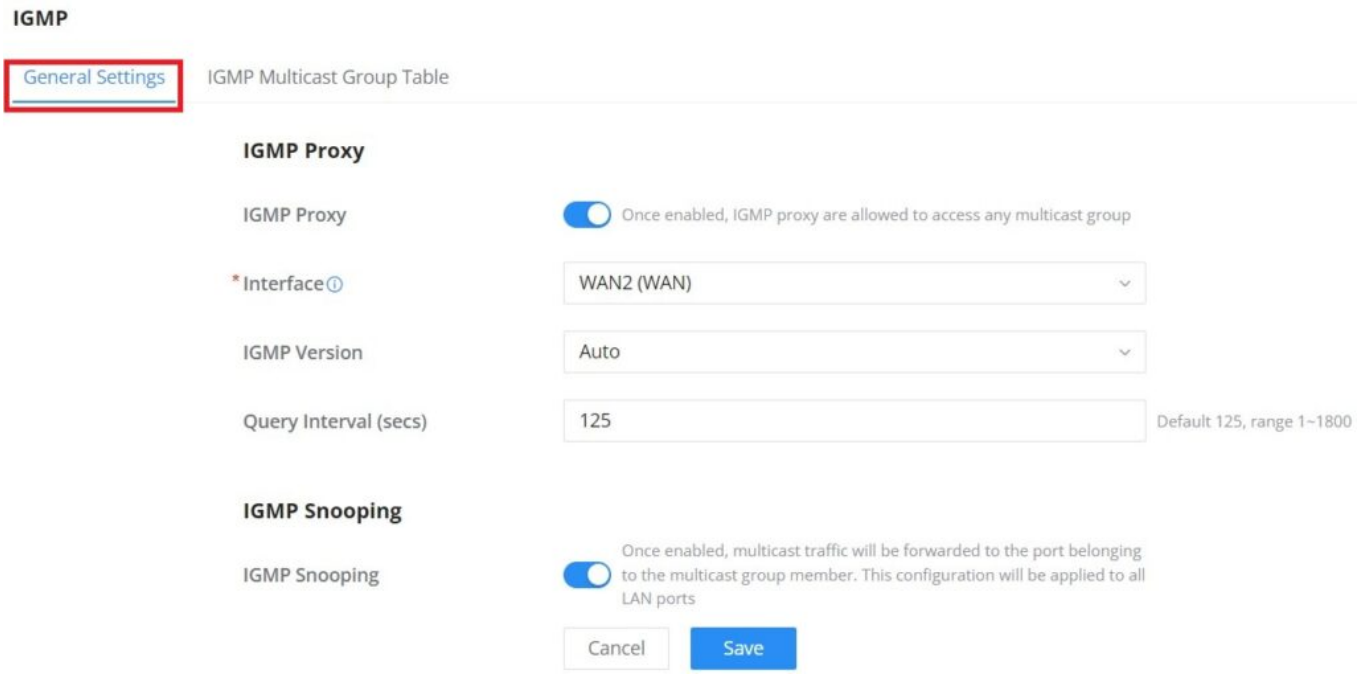
IGMP

When IGMP Proxy is enabled, the device can issue IGMP messages on behalf of the clients behind it; then the GCC6020 will be able to access any multicast group.

To start using IGMP Proxy:

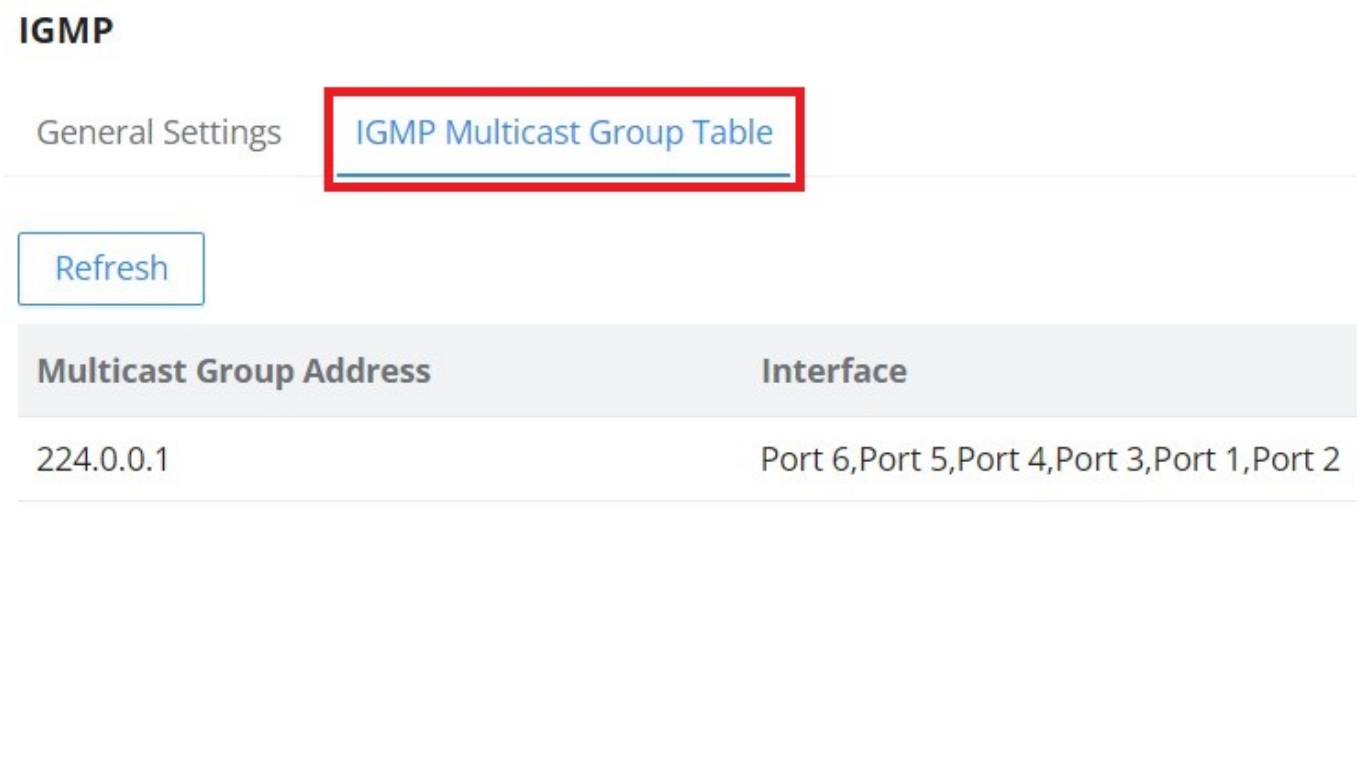
1. Toggle ON IGMP Proxy first.
2. Select the WAN interface to be used from the drop-down list (**Note:** IGMP Proxy cannot be enabled on a WAN port with bridge mode enabled)
3. Select the version, be default is Auto.

The user can also enable IGMP Snooping. Once enabled, multicast traffic will be forwarded to the port belonging to the multicast group member. This configuration will be applied to all LAN ports.



IGMP General Settings

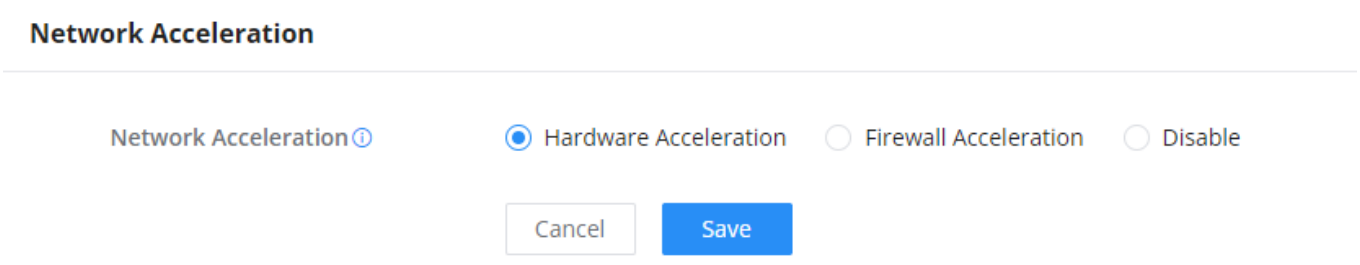
On the IGMP Multicast Group Table, all the active multicast groups will be displayed here.



IGMP IGMP Multicast Group Table

Network Acceleration

Network acceleration allows the GCC6020 to transfer data at a higher rate when Hardware acceleration is enabled. This ensures high performance.



Network Acceleration

- **Hardware Acceleration:** All the network traffic will use dedicated hardware acceleration. Once enabled, QoS, rate limit, and traffic statistics will not take effect.
- **Firewall Acceleration:** Only IDS/IPS and app traffic authorized by the firewall will use dedicated hardware acceleration. Once enabled, QoS rate limit will not take effect.

VPN

VPN stands for "Virtual Private Network", and it encrypts data in real time to establish a protected network connection when using public networks.

VPN allows the router to be connected to a remote VPN server using PPTP, IPSec, L2TP, OpenVPN(R), ZeroTier, and WireGuard(R) protocols, or configure an OpenVPN(R) server and generate certificates and keys for clients.

GCC6020 series devices support the following VPN functions:

- **PPTP:** Client and server
- **IPSec:** Site-to-site and client-to-site
- **OpenVPN(R)**: Client and server
- **ZeroTier:** Client
- **L2TP:** Client
- **WireGuard(R)**: Client-to-Site and Site-to-Site

Protocol Overviews:

- **OpenVPN(R)**: Secure, open-source VPN protocol suitable for cross-platform connections (Windows, Mac, Android, iOS). Supports certificate-based authentication and is ideal for remote workforce access or site-to-site encryption over public networks.
- **ZeroTier:** Provides seamless LAN-like connectivity over the internet using peer-to-peer tunnels, bypassing NAT and firewall complexity without additional network configuration.
- **WireGuard(R)**: Lightweight and modern protocol with fast setup and minimal overhead. Ideal for mobile users or low-resource devices. Supports quick configuration export for peers.
- **IPSec (Site-to-Site)**: Enterprise-grade encryption standard. Suitable for building permanent tunnels between two fixed locations (e.g., HQ <-> Branch). Supports dynamic IP updates and hardware acceleration.
- **PPTP**: Legacy protocol with broad compatibility. Easy to configure but not recommended for high-security needs. Best for internal or low-risk use cases.

For more details on how to configure each VPN protocol separately, please refer to the below guides:

1. **OpenVPN(R)**

- OpenVPN(R) Site-to-Site Guide
- OpenVPN(R) Client-to-Site Guide

2. **L2TP**

- L2TP Client Guide

3. **PPTP Guide**

- PPTP Client-to-Server Guide

4. **WireGuard(R)**

- WireGuard Site-to-Site Guide
- WireGuard Client-to-Server Guide

5. **IPSec**

- IPSec Site-to-Site Configuration Guide
- IPSec Client-to-Site Configuration Guide

6. **ZeroTier**

- ZeroTier VPN - Configuration Guide

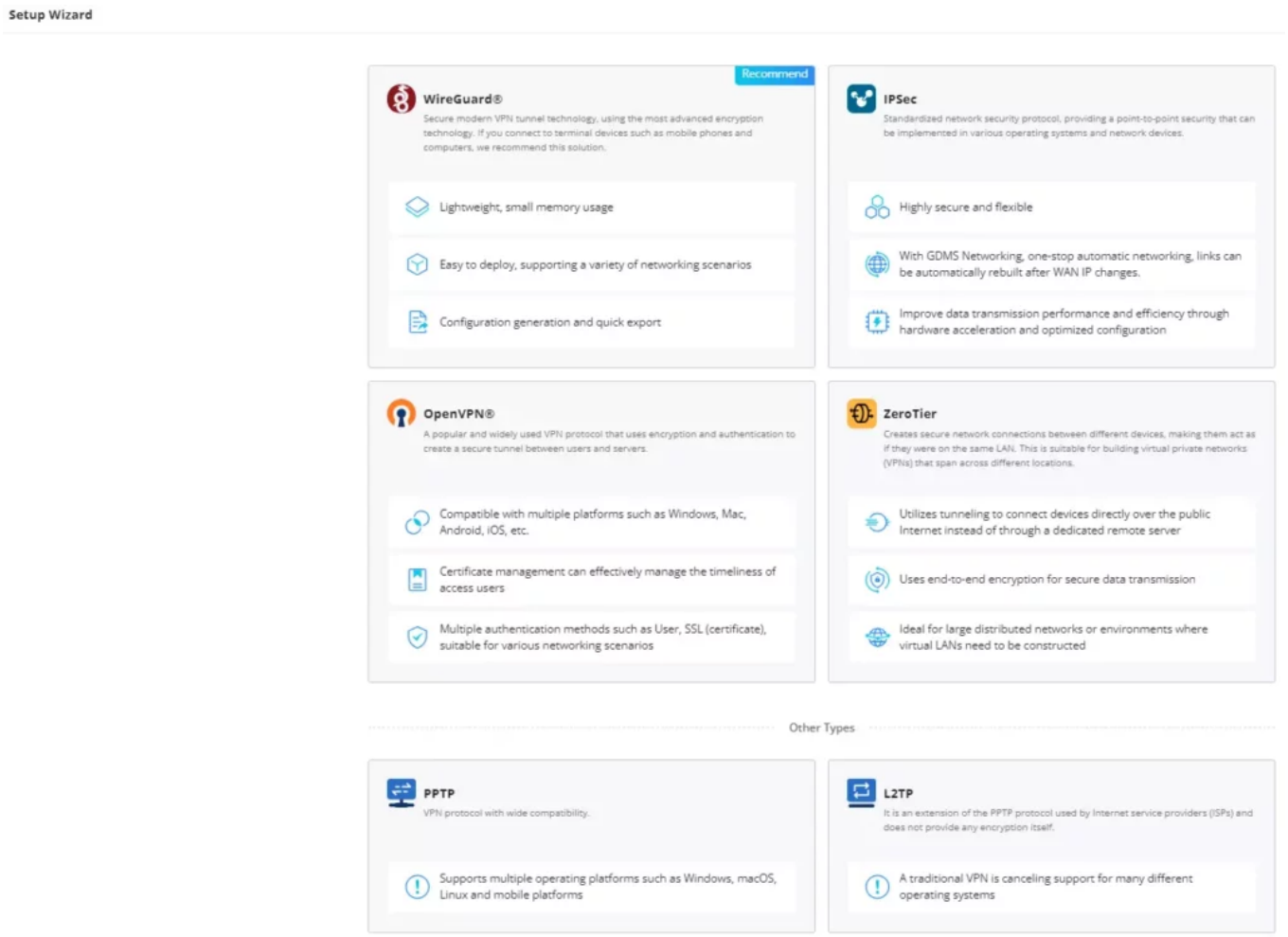
VPN page can be accessed from the Networking module **Web GUI -> VPN**.

Setup Wizard

The main purpose of the Setup Wizard is to help users quickly and efficiently configure VPNs like **WireGuard(R), IPSec, OpenVPN(R), ZeroTier, PPTP**, and **L2TP**. It allows you to configure VPN connections with minimal manual input by automating most of the necessary steps and parameters. This makes it particularly useful for users who may not be familiar with more advanced networking settings.

- **Easy Deployment**: The wizard simplifies VPN deployment, supporting various networking scenarios, including both **client-to-site** and **site-to-site** connections.
- **Predefined Configuration**: Users can select from predefined VPN options, such as WireGuard(R), IPSec, OpenVPN(R), etc., based on their needs. Each type of VPN comes with different available scenes and configurations.

Purpose: The primary goal of this wizard is to make VPN setup **faster** and **easier** by automating many of the common settings. This reduces the likelihood of misconfigurations and ensures a smoother setup experience, especially for users who may not have in-depth knowledge of VPN protocols.



VPN Setup Wizard

Relation to Manual Configuration: It's important to note that the VPN Setup Wizard mirrors the **same configuration process** as manually configuring VPNs, but in a more user-friendly way. Advanced users can still manually configure VPNs if needed, but for most users, the wizard offers a more accessible method.

VPN-Type Specific:

The wizard is tailored for each VPN type. For instance:

- **WireGuard(R)**: Prioritizes fast, low-latency connections with a simple and secure setup.
- **IPSec**: Provides robust encryption and secure communication for both site-to-site and client-to-site scenarios.
- **OpenVPN(R)**: Allows more customizable security options, such as user-based certificate management and SSL encryption.
- **ZeroTier:** Creates secure peer-to-peer tunnels over the Internet, allowing remote devices to behave as if they're on the same LAN. Ideal for building virtual LANs across distributed environments without relying on dedicated servers.
- **PPTP/L2TP**: While legacy protocols, these are supported for backward compatibility with older devices and systems.

By following this wizard, users can rapidly configure the required VPN connections without needing to navigate complex settings manually, making it an ideal solution for businesses looking to enhance security without complexity.

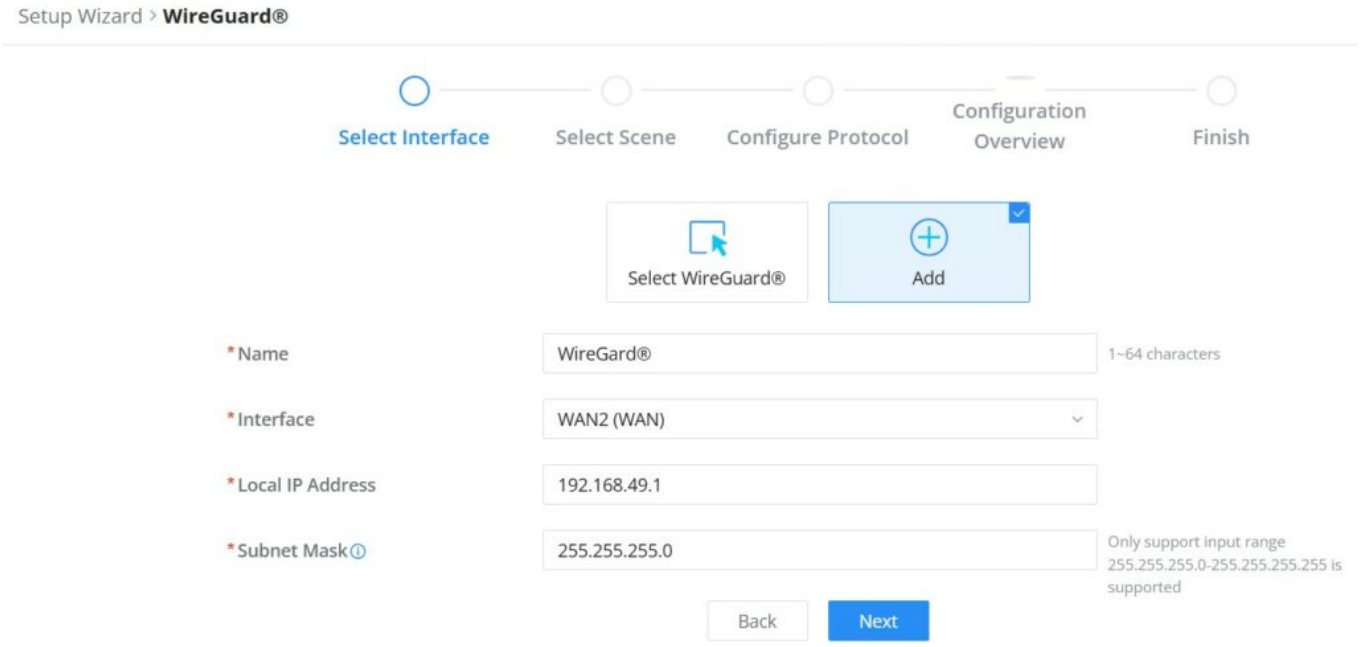
- **WireGuard(R) Setup Wizard**

WireGuard uses fewer parameters for faster setup. You'll be prompted to:

- Name the connection

- Choose the router and WAN interface
- Assign the local IP and subnet

For advanced features like Peers and Remote Clients, refer to WireGuard(R) Manual Configuration.



WireGuard(R) Example

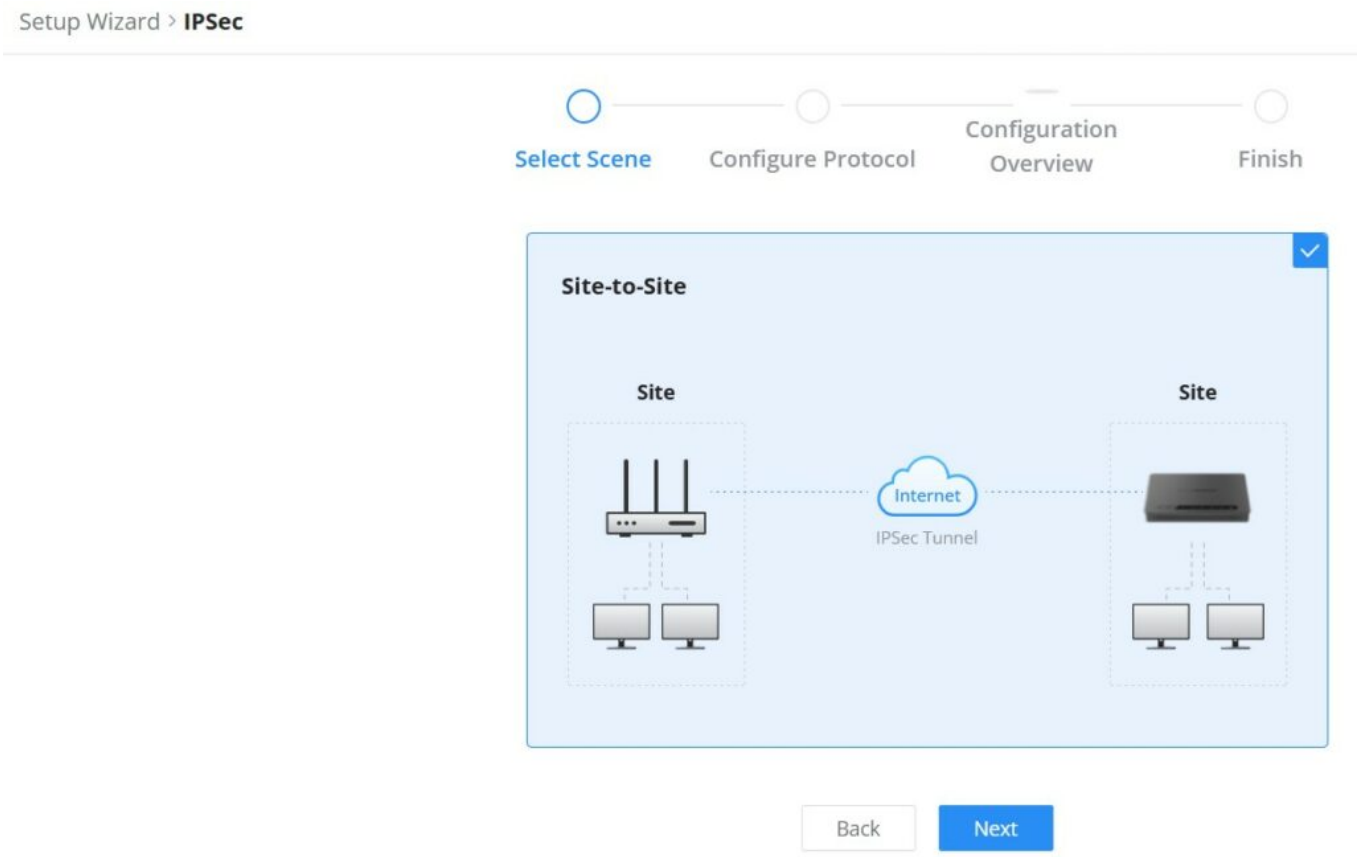
- **IPSec Setup Wizard**

Designed for secure office-to-office tunnels. Simply select the Site-to-Site mode, and the wizard handles tunnel basics like endpoint roles and tunnel IPs.

Why use this:

- Ideal for permanent, encrypted connections between two static sites
- Supports automatic rebuild after WAN IP changes

For detailed control and manual tuning, see IPSec Site-to-Site Setup.



IPSec Example

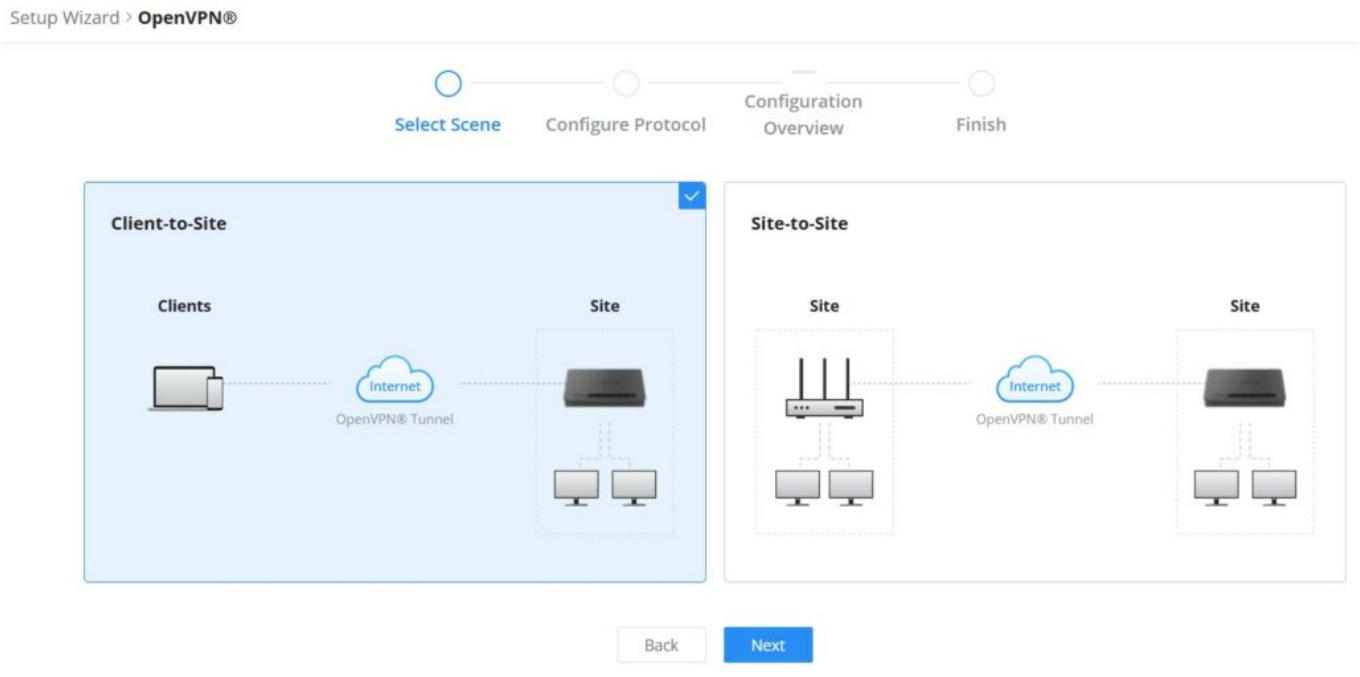
- **OpenVPN(R) Setup Wizard**

Choose between:

- **Client-to-Site** - For remote users to connect securely to a central office.
- **Site-to-Site** - To connect two office networks over the internet.

Once selected, the wizard will guide you through server selection, certificate management, and encryption options.

For advanced configuration, refer to OpenVPN(R) Manual Setup.



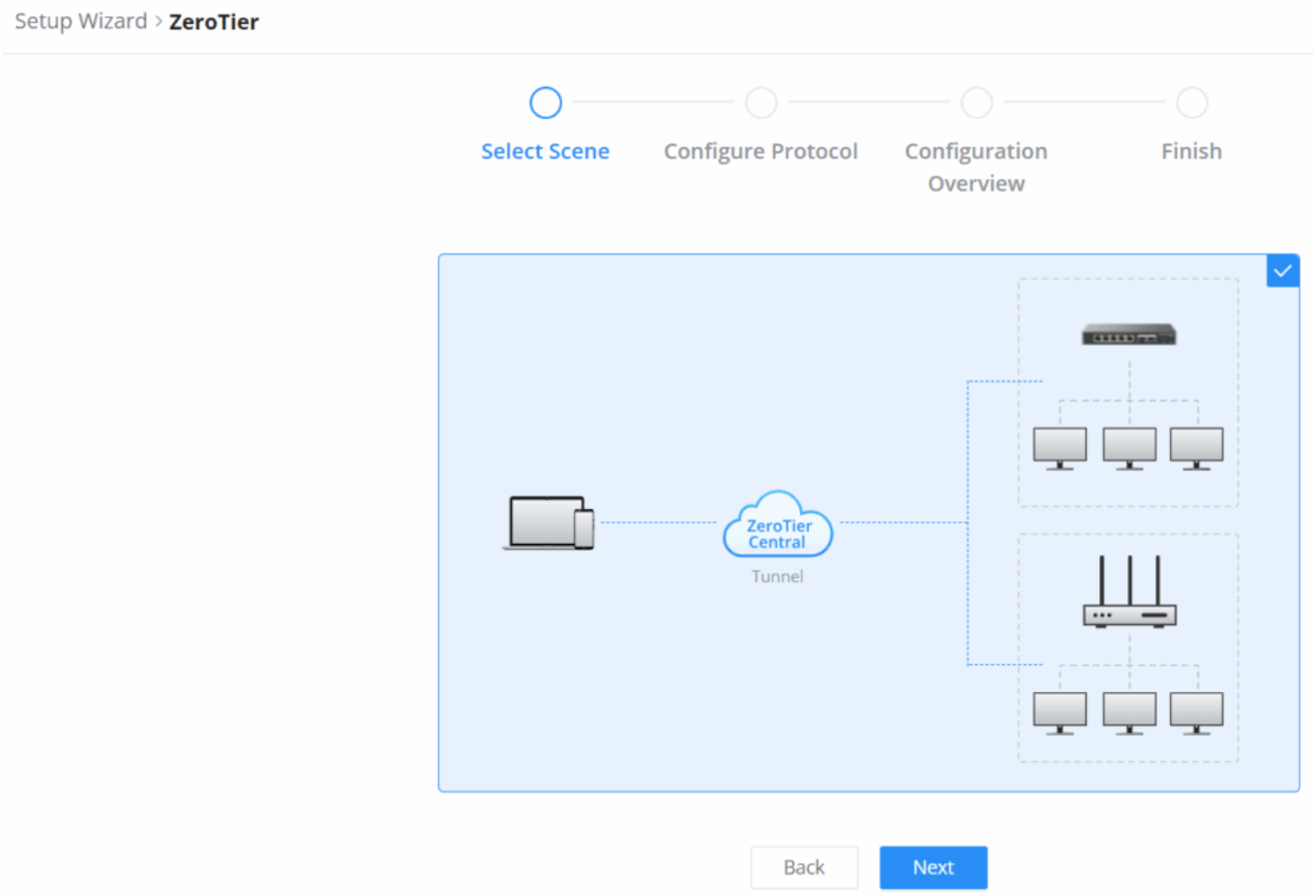
OpenVPN(R) Example

- **ZeroTier**

ZeroTier is available as a selectable VPN type in the Setup Wizard.

Choose this option to create a secure virtual network overlay between distributed devices using **ZeroTier Central** as the orchestrator. It simplifies peer-to-peer connections across NAT,firewalls, and different networks.

For full configuration steps, see ZeroTier VPN



ZeroTier Example

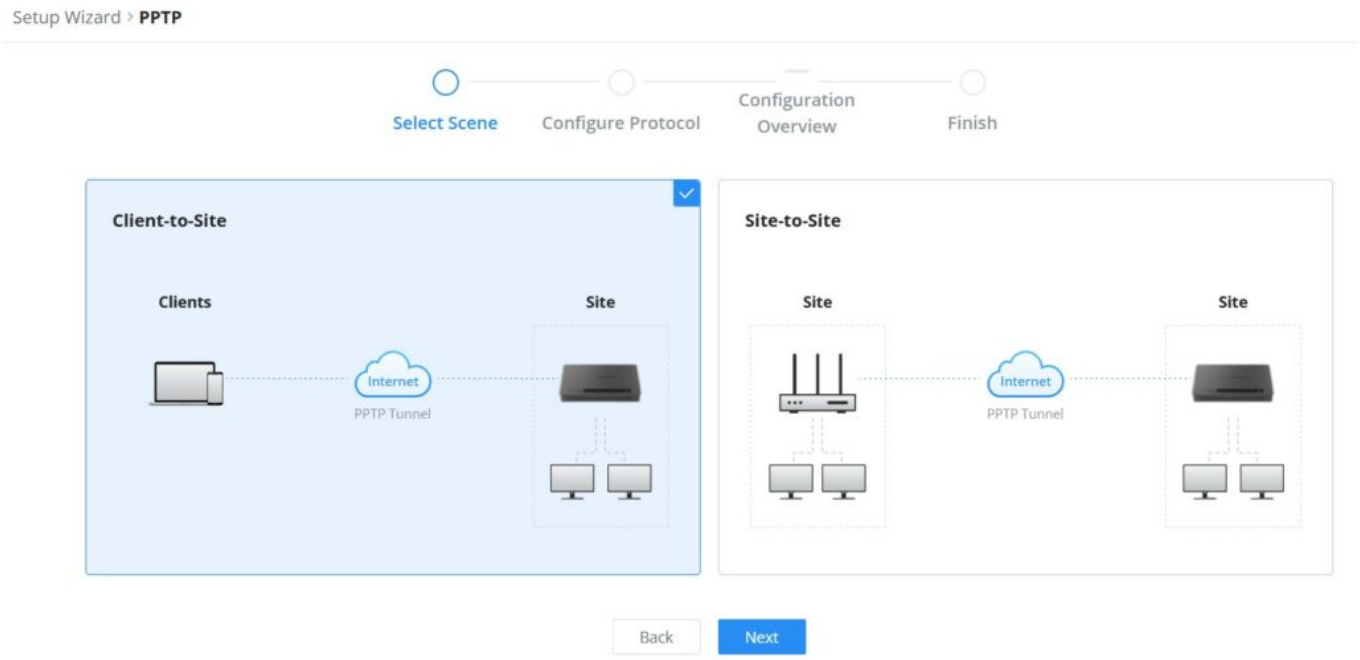
- **PPTP Setup Wizard**

Choose:

- **Client-to-Site** - For basic remote user access
- **Site-to-Site** - For simple office-to-office bridging

PPTP is the easiest to set up, but less secure. Only use it in trusted environments or for quick internal access.

For more configuration options, refer to PPTP Setup.



PPTP Example

- **L2TP Setup Wizard**

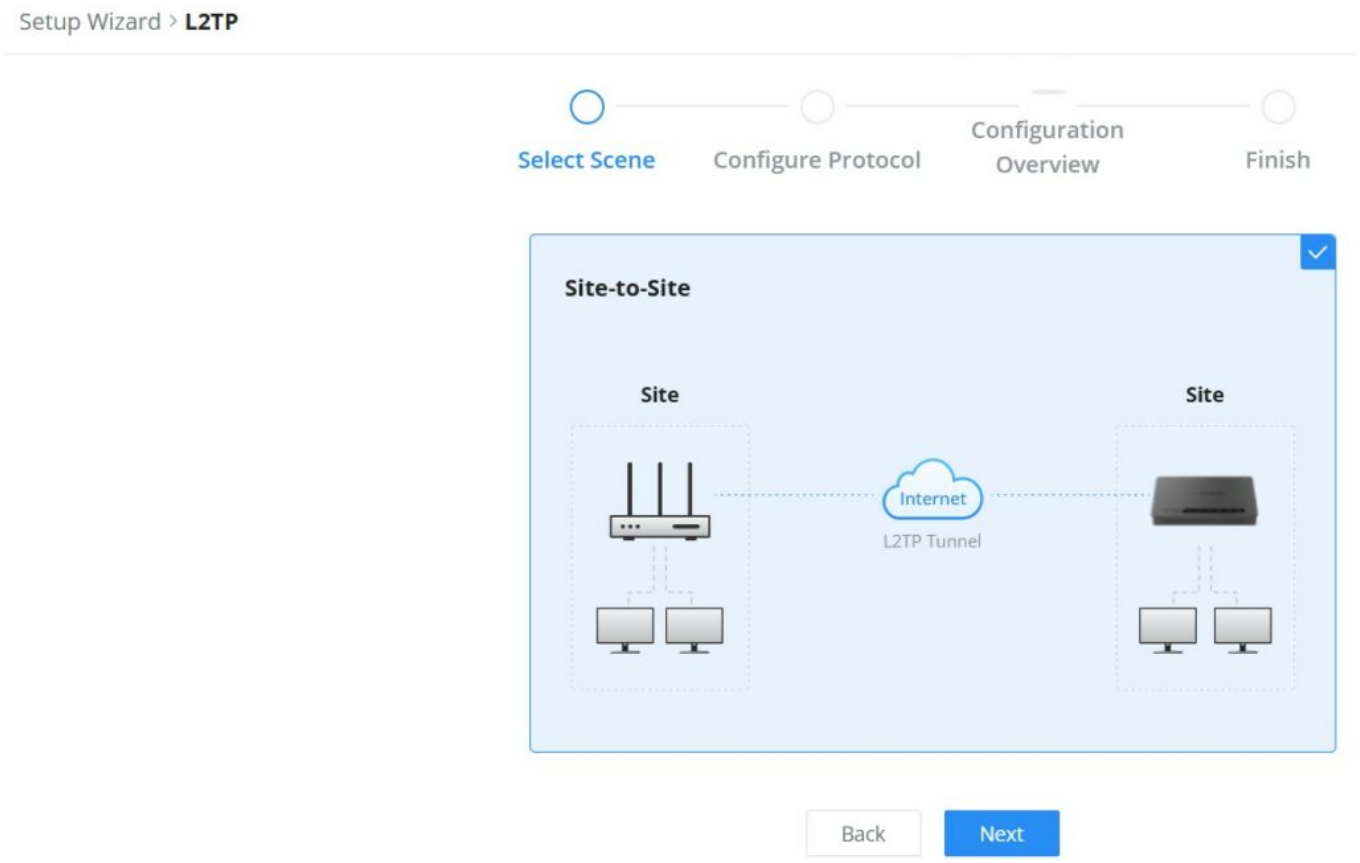
Designed for simple **site-to-site** tunnels over the internet. Select **Site-to-Site** mode, and the wizard will guide you through configuring endpoints and authentication settings.

Why use this:

- Suitable for connecting two office networks through an L2TP tunnel.
- Useful in environments where legacy VPN compatibility is required.

L2TP does not provide encryption by itself. It is recommended to use L2TP with IPsec for secure communication. Be aware that native L2TP support is being phased out on many modern operating systems

For detailed configuration and advanced options, see **L2TP Setup**.



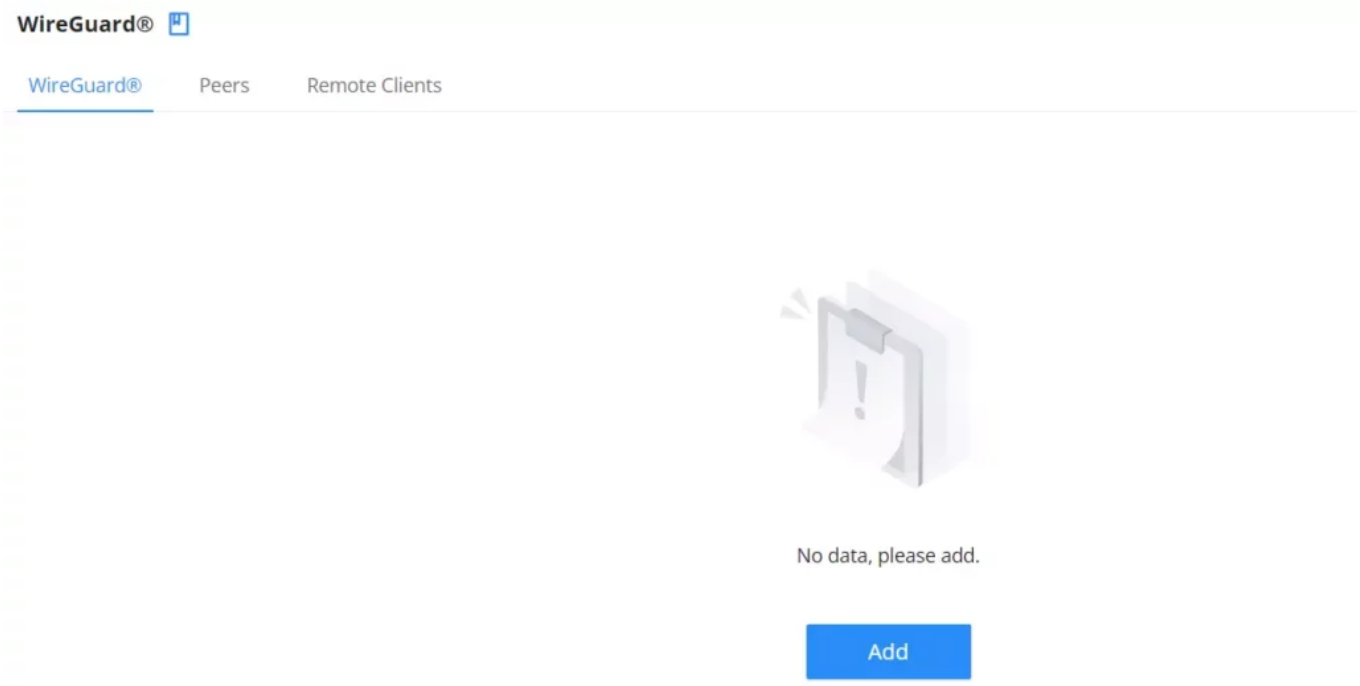
L2TP Example

When the VPN is disabled, the associated configuration is not deleted. This ensures that your settings are preserved and can be quickly reactivated when the VPN is enabled again.

WireGuard(R)

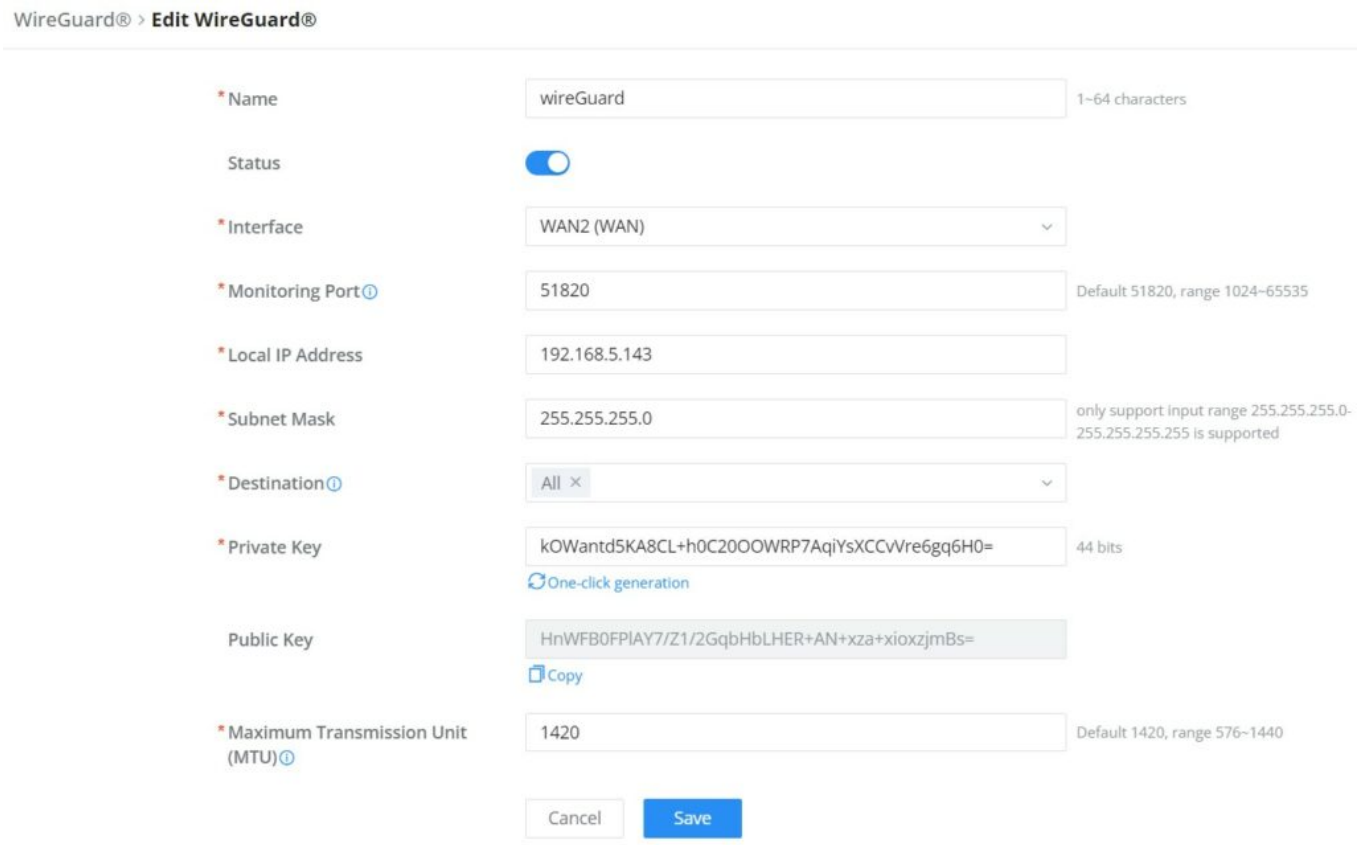
WireGuard(R) is a free, open-source VPN solution that offers high performance, ease of use, and robust security for encrypting virtual private networks. The GCC6020 series routers support WireGuard(R) VPN with features like automatic client generation and QR code scanning for easy setup on mobile devices and other devices with camera support. WireGuard(R) can be configured to create Peers for Site-to-Site connections or to establish clients for terminal devices, such as mobile phones and computers.

To start using WireGuard**(R)** VPN, please navigate to **Web UI -> VPN -> WireGuard(R) page**. Click the "**Add** " button to add a WireGuard**(R)** server as shown below:



Add WireGuard(R)

Please refer to the figure and table below when filling out the fields.



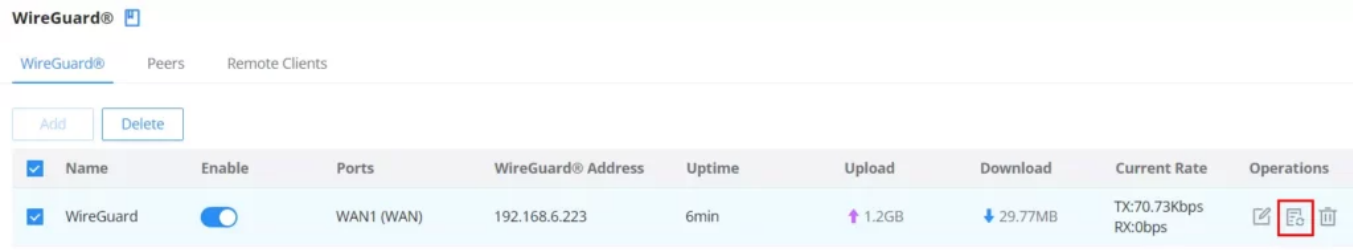
AddEdit WireGuard(R)

Name	Specify a name for Wireguard(R) VPN.
Status	Toggle ON or OFF to enable or disable the Wireguard(R) VPN.
Interface	Select from the drop-down list the WAN port.
Monitoring Port	Set the local listening port when establishing a WireGaurd(R) tunnel.Default: 51820

Local IP Address	Specify the network that WireGuard(R) clients (Peers) will get IP address from.
Subnet Mask	Configures the IP address range available to the Peers.
Destination	Select the Destination(s) from the drop-down list.Note: When selecting "All", subsequent new interfaces will be automatically included.
Private Key	Click on "One-Click Generation" text to generate a private key.
Public Key	The public key will be generated according to the private key.Click on "Copy" text to copy the public key.
Maximum Transmission Unit (MTU)	This indicates the size of the packets sent by the router. Please do not change this value unless necessary. By default is 1450.

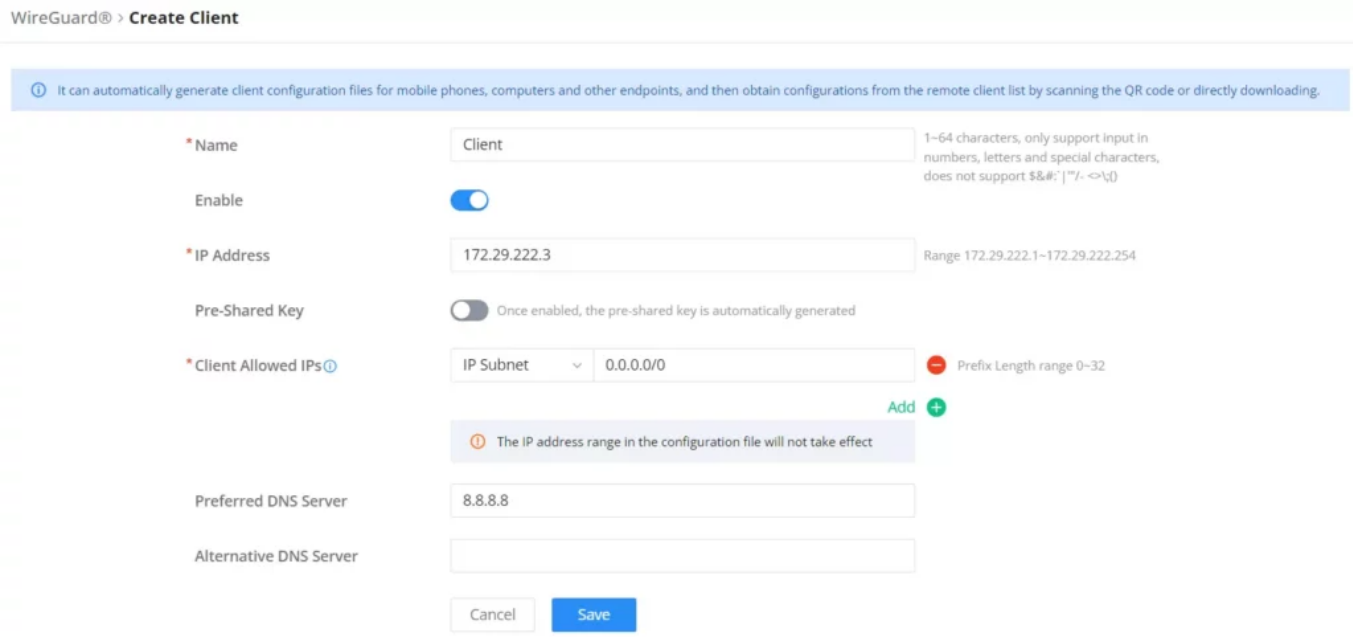
Add/Edit WireGuard(R)

Once finished configuring WireGuard**(R)**, click the "**Add client**" icon to generate clients very quickly and easily as shown in the figures below:



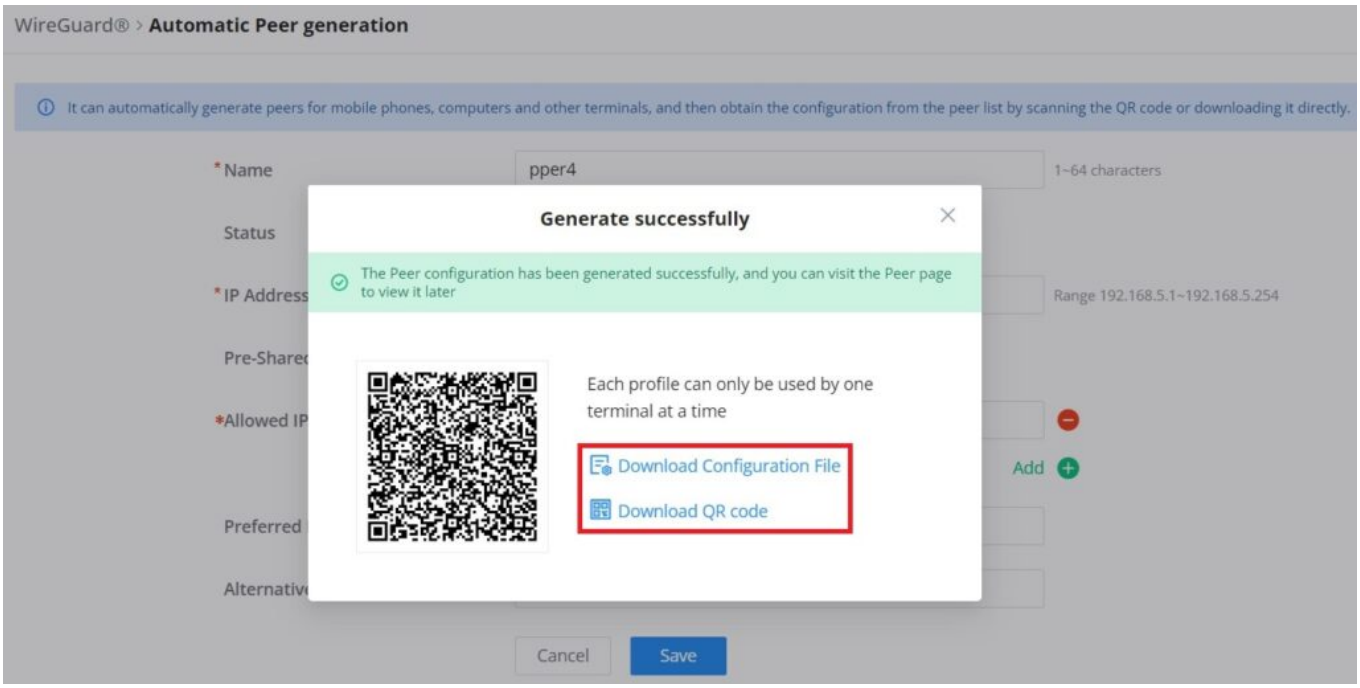
WireGuard(R) Add Client

Enter a name and toggle status **ON**, then click the "**Save**" button.



WireGuard(R) Add client part 1

Now, the user can either download the configuration file and share it, or download QR code for devices like mobile phones to scan.

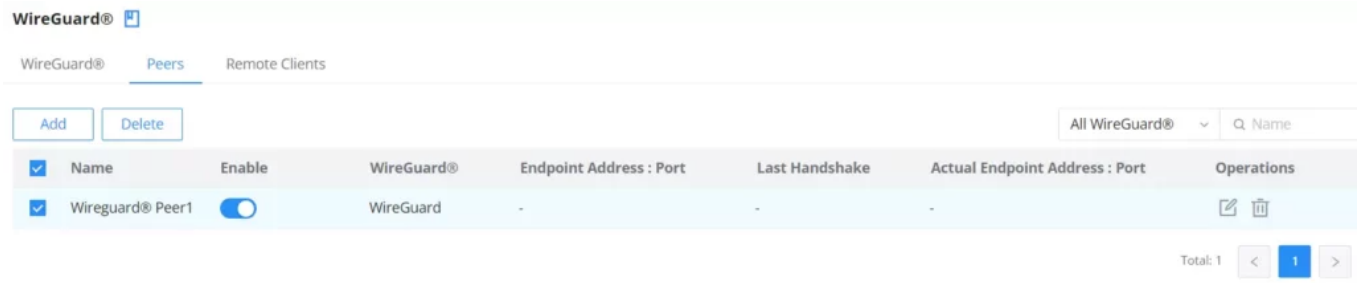


WireGuard(R) Add clients part 2

For more details, refer to this guide: WireGuard(R) Site-to-Client.

Peers

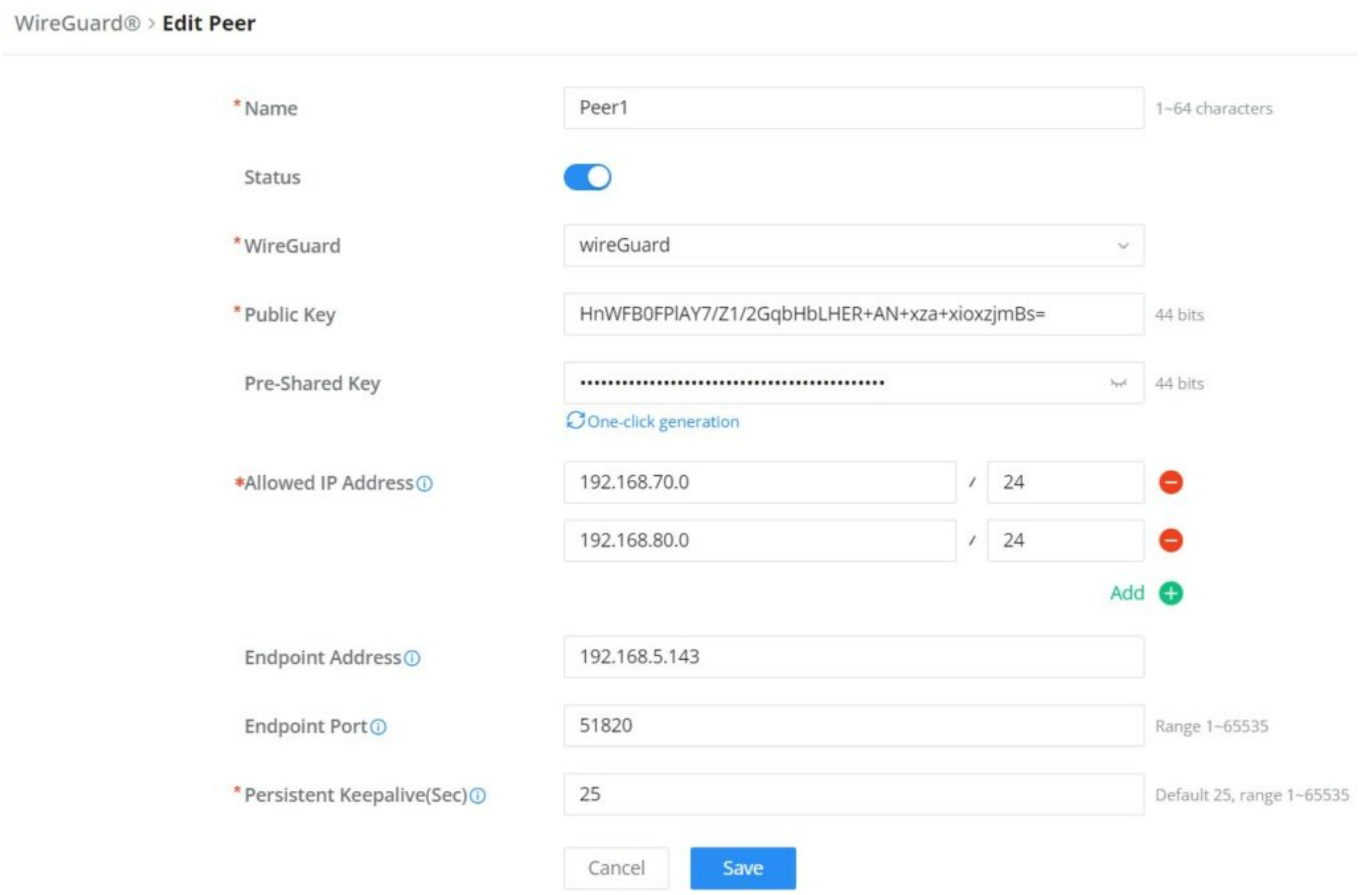
On the Peers tab, users can create Site-to-Site connections by clicking the '**Add**' button to configure new WireGuard peers.



WireGuard(R) Peers tab

for more details, refer to this guide: WireGuard(R) Site-to-Site.

Please refer to the figure below when filling out the fields.



WireGuard(R) addedit peer

Field	Description
Name	Define a name for the peer (1-64 characters).
Enable	Toggle to enable or disable the peer connection.
WireGuard(R)	Select the WireGuard(R) instance associated with this peer.
Public Key	Enter the public key of the remote peer (44 bits).
Pre-Shared Key	(Optional) Enter a pre-shared key for additional security (44 bits).
Allowed IP Address	Specify the IP ranges allowed to communicate through this peer (CIDR format).
Endpoint Address	Enter the IPv4 address or domain name (FQDN) of the remote endpoint.
Endpoint Port	Define the port used to connect to the remote endpoint (Range: 1-65535).
Persistent Keepalive	Set the interval (in seconds) to maintain the connection (Default: 25).

WireGuard(R) - add/edit peer

Remote Clients

The **Remote Clients** tab displays a list of all connected WireGuard(R) clients. Each client connection is shown with relevant details such as:

- **Name**: The client's configured name.
- **Enable**: Toggle to enable or disable the connection for the client.
- **WireGuard(R)**: Displays the WireGuard(R) instance the client is connected to.
- **Last Handshake**: Shows when the last successful handshake with the client occurred.

- **Actual Endpoint Address : Port**: Displays the client's current IP address and port.

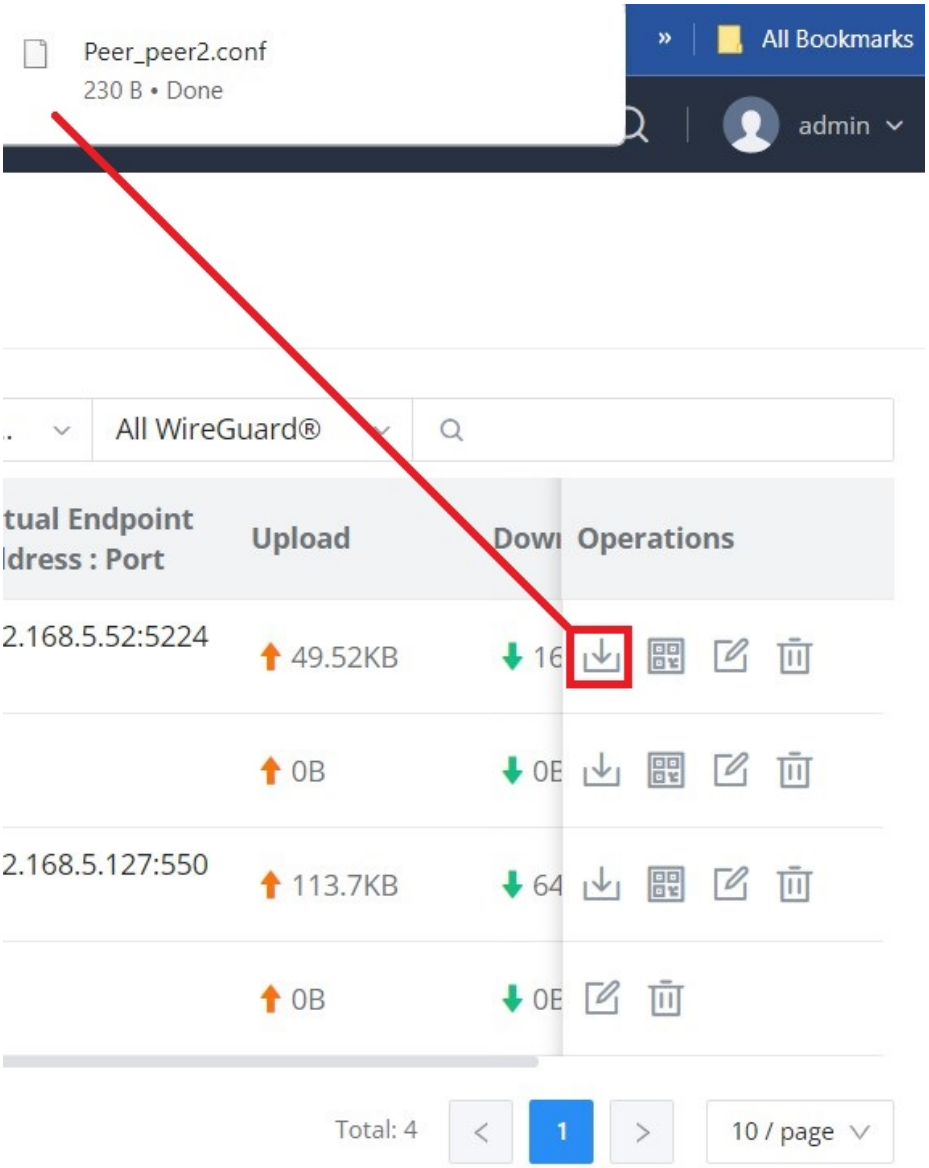
Operations include:

- View connection details.
- Download client configuration file or QR code.
- Edit or delete the client configuration

To view connected clients, navigate to **VPN -> WireGuard(R) -> Remote Clients**.

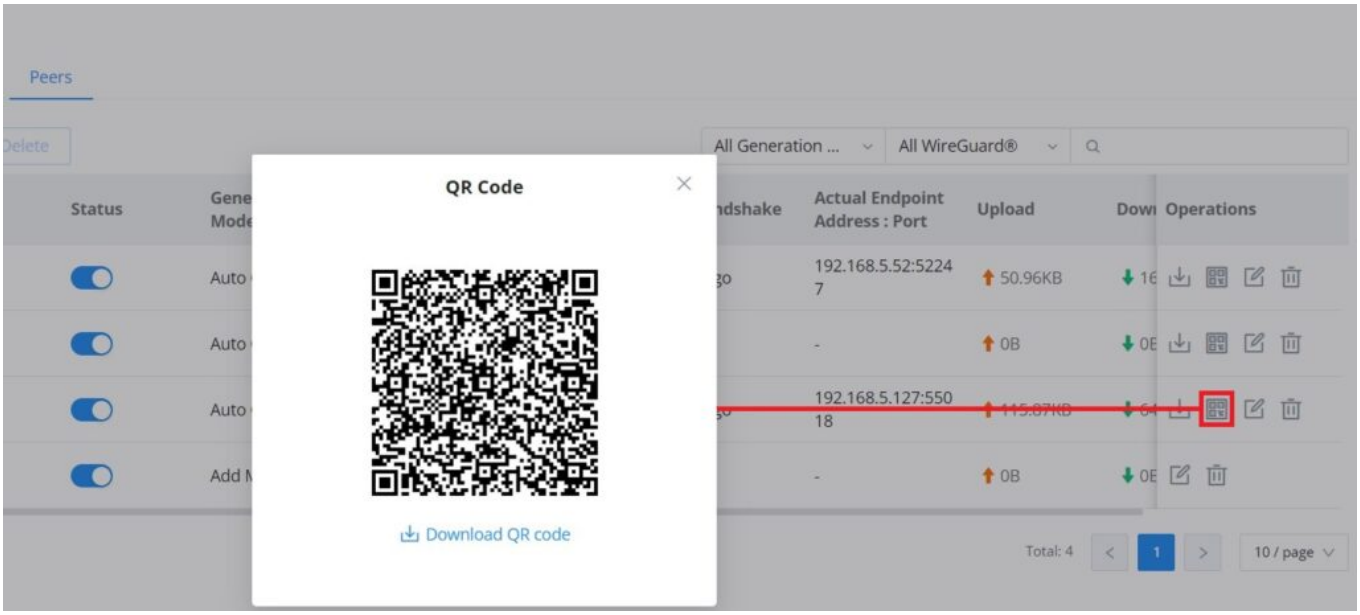
WireGuard(R) Remote Clients

The user can download the config file after adding the client.



WireGuard(R) download client config

Or scanning the QR code for devices with camera support.



WireGuard(R) scan client config

IPSec

IPSec, or Internet Protocol Security, is mainly used to authenticate and encrypt packets of data sent over the network layer. To accomplish this, they use two security protocols - ESP (Encapsulation Security Payload) and AH (Authentication Header); the former provides both authentication and encryption, whereas the latter provides only authentication for the data packets. Since both authentication and encryption are equally desirable, most of the implementations use ESP.

IPSec supports two different encryption modes; they are Tunnel (default) and Transport mode. Tunnel mode is used to encrypt both payloads as well as the header of an IP packet, which is considered to be more secure. Transport mode is used to encrypt only the payload of an IP packet, which is generally used in gateway or host implementations.

IPSec also involves the IKE (Internet Key Exchange) protocol, which is used to set up the Security Associations (SA). A Security Association establishes a set of shared security parameters between two network entities to provide secure network layer communication. These security parameters may include the cryptographic algorithm and mode, traffic encryption key, and parameters for the network data to be sent over the connection. Currently, there are two IKE versions available - IKEv1 and IKEv2. IKE works in two phases:

Phase 1: ISAKMP operations will be performed after a secure channel is established between two network entities.

Phase 2: Security Associations will be negotiated between two network entities.

IKE operates in three modes for exchanging keying information and establishing security associations - Main, Aggressive, and Quick mode.

* **Main Mode:** is used to establish phase 1 during the key exchange. It uses three two-way exchanges between the initiator and the receiver. In the first exchange, algorithms and hashes are exchanged. In the second exchange, shared keys are generated using the Diffie-Hellman exchange. In the last exchange, verification of each other's identities takes place.

* **Aggressive mode**: provides the same service as the main mode, but it uses two exchanges instead of three. It does not provide identity protection, which makes it vulnerable to hackers. The main mode is more secure than this.

* **Quick mode**: After establishing a secure channel using either the main mode or aggressive mode, the

quick mode can be used to negotiate general IPsec security services and generate newly keyed material. They are always encrypted under a secure channel and use a hash payload that is used to authenticate the rest of the packet.

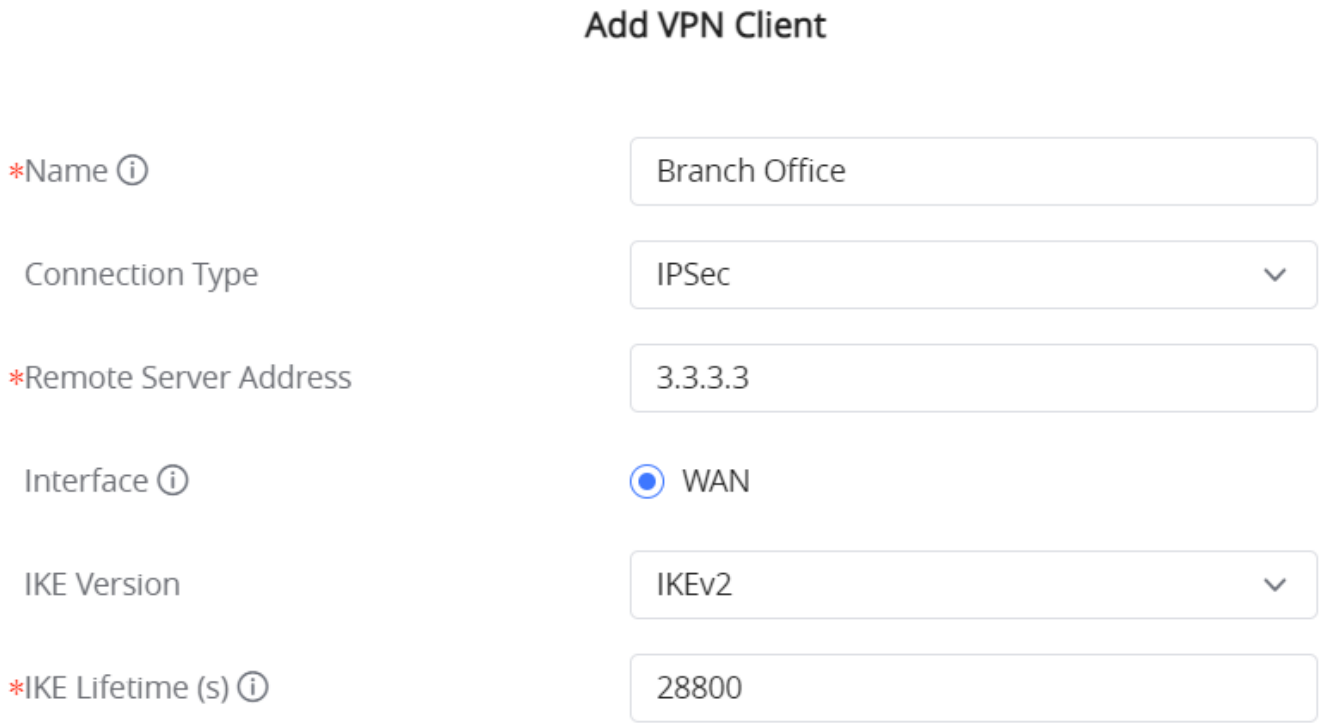
IPSec Site-to-Site

To build an IPSec secure tunnel between two sites located in two distant geographical locations, we can use the sample scenario below:

The branch office router needs to connect to the Headquarters office via an IPSec tunnel; on each side, we have a GCC device. Users can configure the two devices as follows:

The branch office router runs a LAN subnet 192.168.1.0/24, and the HQ router runs a LAN subnet 192.168.3.0. The public IP of the branch office router is 1.1.1.1, and the IP of the HQ router is 2.2.2.2.

Go to **VPN -> IPSec -> Site-to-Site,** then click on the button to add a VPN Client.



Add VPN Client IPSec

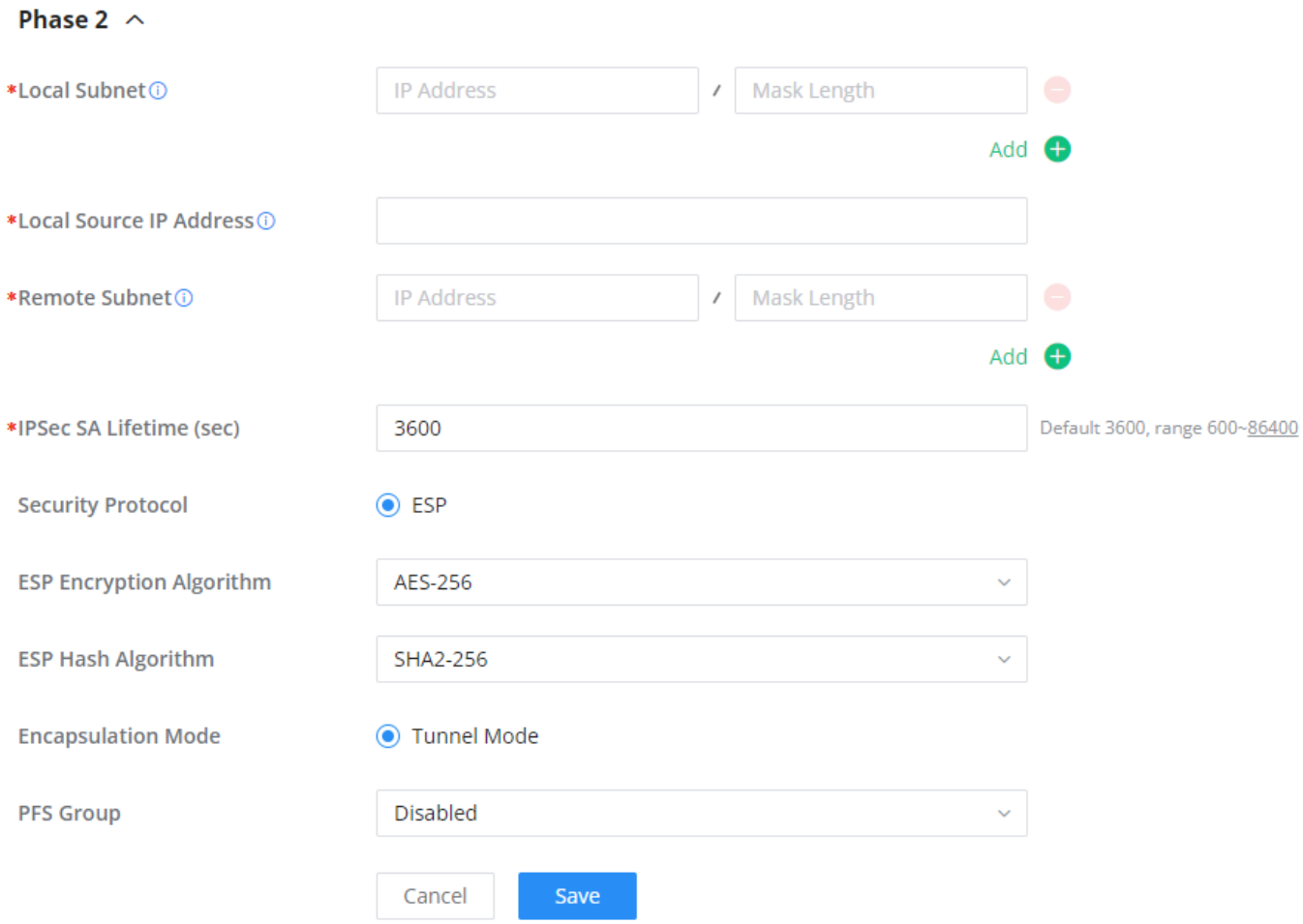
? Phase 1

Phase 1

Negotiation Mode	Main / Aggressive
*Pre-shared Key	1~64 characters
Encryption Algorithm	AES-256
Hash Algorithm	SHA2-256
DH Group	Group14
Local ID	
Remote ID	
Reconnect	
*Number of Reconnect	10 — The default value is 10, and the valid range is 0-10. Value 0 means that it has been trying to negotiate connection.
DPD	
*DPD Delay Time (sec)	30 — Default 30, range 10~900
*DPD Idle Time (sec)	120 — Default 120, range 10~900
DPD Action	Hold / Clear / Restart

Add VPN Client Phase 1

? Phase 2



Add VPN Client Phase 2

After this is done, press "Save" and do the same for the HQ Router. The two routers will build the tunnel and the necessary routing information to route traffic through the tunnel back and from the branch office to the HQ network.

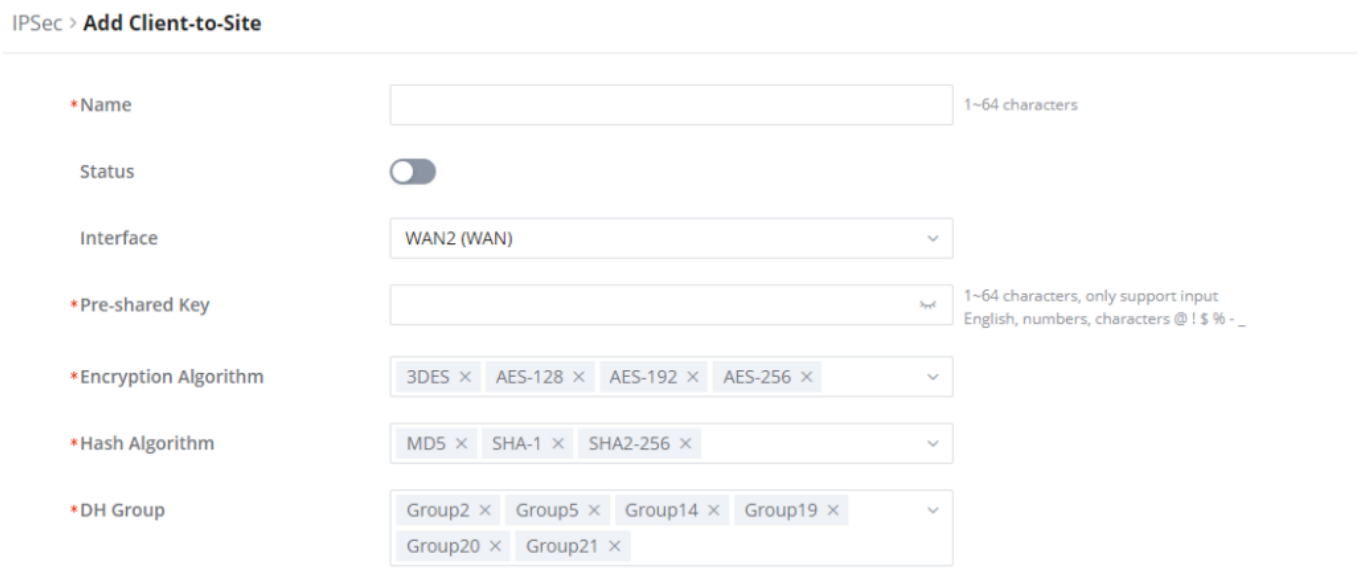
After the connection is established, the incoming packets from the remote subnet are automatically released, and it is not necessary to manually configure the firewall forwarding rules from WAN to LAN to release traffic.

- **Create the remote user credentials:**

To create the remote user account, which will be required to be entered on the client side and authenticated on the server side, please refer to the **Remote Users** section.

IPSec Client-to-Site

Go under **VPN -> IPSec -> Client-to-Site,** then fill in the following information:



Branch Office IPSec Configuration

OpenVPN(R)

OpenVPN(R)is a virtual private network solution that establishes a secure connection to a distant host. VPN provides the possibility to reach hosts that are located on a local area network and be logically located in that same local area network, hence the name Virtual Private Network. The connection between the client and the server is authenticated using a username and password and/or TLS encryption.

Typically,users can set up a client-to-server connection, the client being a computer, and the server being a GWN router or a GCC device. The user can also set up a site-to-site VPN connection using OpenVPN(R) to interconnect two sites securely. In the following sections, you can find an explanation for all the configuration fields for OpenVPN(R).

OpenVPN(R) Client

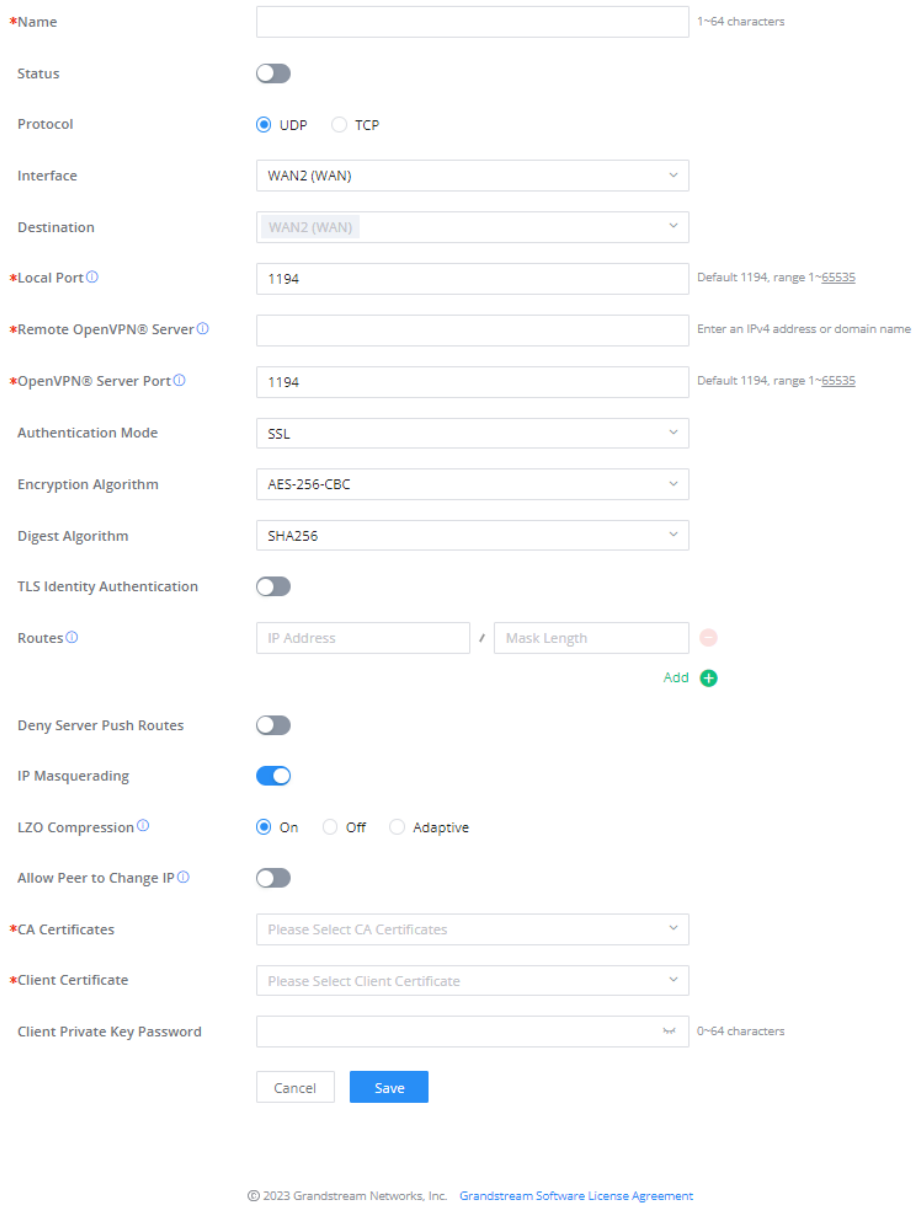
There are two ways to use the device as an OpenVPN(R) client:

1. Upload the client certificate created from an OpenVPN(R) server to the GCC602x device.

2. Create client/server certificates on the GCC602x device and upload the server certificate to the OpenVPN(R) server.

Go to **VPN** -> **OpenVPN(R)** -> **OpenVPN(R) Clients** and follow the steps below:

Click on the button. The following window will pop up.



OpenVPN(R) Client

Clickafter completing all the fields.

Name	Enter a name for the OpenVPN(R) Client.
Status	Toggle on/off the client account.
Protocol	Specify the transport protocol used. UDP TCP Note: The default protocol is UDP.
Interface	Select the WAN port to be used by the OpenVPN(R) client.
Destination	Select the WANs, VLANs and VPNs (clients) destinations that will be used by this OpenVPN(R) client.
Local Port	Configures the client port for OpenVPN(R).The port between the OpenVPN(R) client and the client or between the client and the server should not be the same.
Remote OpenVPN(R) Server	Configures the remote OpenVPN(R) server. Both IP address and domain name are supported.
OpenVPN(R) Server Port	Configures the remote OpenVPN(R) server port
Authentication Mode	Choose the authentication mode. SSL User Authentication SSL + User Authentication PSK

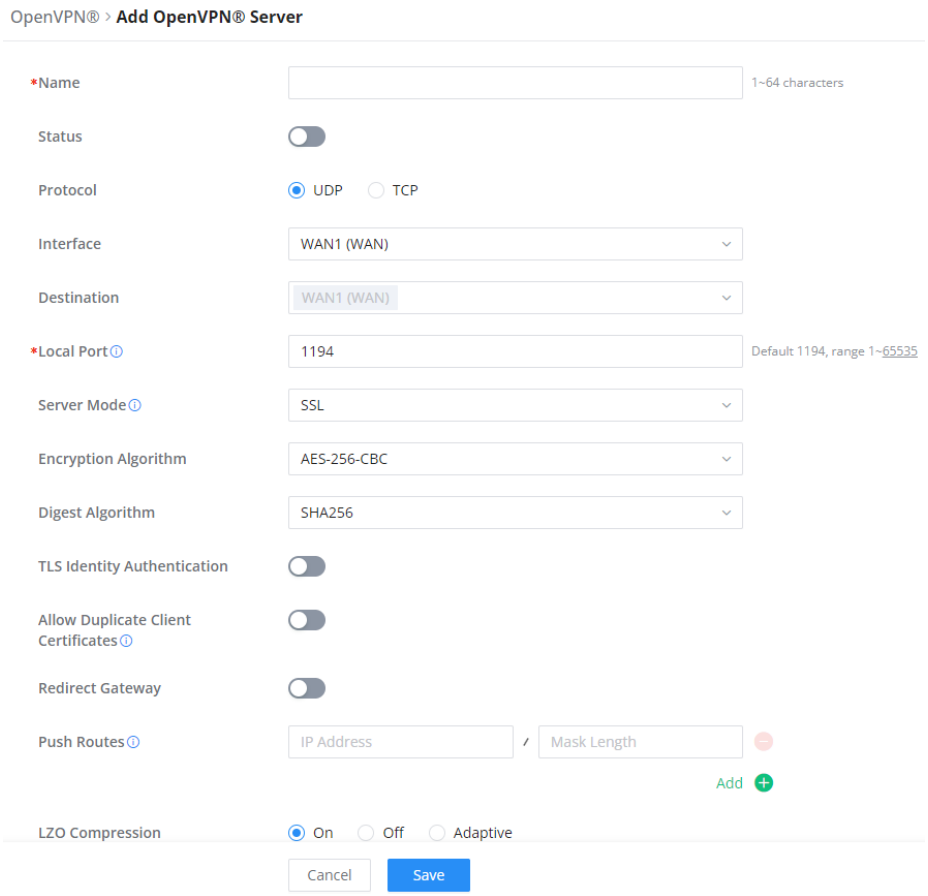
Encryption Algorithm	Choose the encryption algorithm. The encryption algorithms supported are: DES RC2-CBC DES-EDE-CBC DES-EDE3-CBC DESX-CBC BF-CBC RC2-40-CBC CAST5-CBC RC2-64-CBC AES-128-CBC AES-192-CBC AES-256-CBC SEED-CBC
Digest Algorithm	Select the digest algorithm. The digest algorithms supported are: MD5 RSA-MD5 SHA1 RSA-SHA1 DSA-SHA1-old DSA-SHA1 RSA-SHA1-2 DSA RIPEMD160 RSA-RIPEMD160 MD4 RSA-MD4 ecdsa-with-SHA1 RSA-SHA256 RSA-SHA384 RSA-SHA512 RSA-SHA224 SHA256 SHA384 SHA512 SHA224 whirlpool
TLS Identity Authentication	Enable TLS identity authentication direction.
TLS Identity Authentication Direction	Select the indentity authentication direction. Server: Indentity authentication is performed on the server side. Client: Identity authentication is performed on the client side. Both: Identity authentication is performed on both sides.
TLS Pre-Shared Key	Enter the TLS pre-shared key.
Routes	Configures IP address and subnet mask of routes, e.g., 10.10.1.0/24.
Deny Server Push Routes	If enabled, client will ignore routes pushed by the server.
IP Masquerading	This feature is a form of network address translation (NAT) which allows internal computers with no known address outside their network, to communicate to the outside. It allows one machine to act on behalf of other machines.
LZO Compression	Select whether to activate LZO compression or no, if set to "Adaptive", the server will make the decision whether this option will be enabled or no. LZO encoding provides a very high compression ratio with good performance. LZO encoding works especially well for CHAR and VARCHAR columns that store very long character strings.
Allow Peer to Change IP	Allow remote change the IP and/or Port, often applicable to the situation when the remote IP address changes frequently.
CA Certificates	Click on "Upload" and select the CA certificate Note: This can be generated in System Settings -> Certificates -> CA Certificate
Client Certificate	Click on "Upload" and select the Client Certificate. Note: This can be generated in System Settings -> Certificates -> Certificate
Client Private Key Password	Enter the client private key password. Note: This can be configured in VPN -> Remote User

OpenVPN(R) Client

OpenVPN(R) Server

To use the GCC602x as an OpenVPN(R) server, you will need to start creating OpenVPN(R) certificates and remote users.

To create a new VPN server, navigate to **Web UI -> VPN -> OpenVPN(R) page -> OpenVPN(R) Servers tab.**



Create OpenVPN(R) Server

Clickafter completing all the fields.

Refer to the table below:

Name	Enter a name for the OpenVPN(R) server.
Status	Toggle ON or OFF to enable or disable the OpenVPN(R) Server.
Protocol	Choose the Transport protocol from the dropdown list, either TCP or UDP.The default protocol is UDP.
Interface	Select from the drop-down list the exact interface (WAN).
Destination?	Select from the drop-down list the destination (WAN or VLAN).
Local Port	Configure the listening port for OpenVPN(R) server.The default value is 1194.
Server Mode	Select the authentication method used between the server and connected clients. support for RADIUS-based authentication modes. Available options:Certificate: Only certificates are used (no username/password).User Authentication: Username and password only.Certificate + User: Requires both certificate and user login.RADIUS Authentication: Uses external RADIUS server for authentication.Certificate Authentication + RADIUS Authentication: Dual validation with both certificate and RADIUS.PSK: Uses a pre-shared key for IP-based tunneling. Notes:* If the Server Mode is set to Certificate, User Authentication, Certificate + User, or PSK, go to Remote Users to configure the corresponding user settings.* If the OpenVPN(R) Server uses RADIUS Authentication, all clients connecting to the VPN must use User Authentication.
Encryption Algorithm	Choose the encryption algorithm from the dropdown list to encrypt data so that the receiver can decrypt it using same algorithm.
Digest Algorithm	Choose digest algorithm from the dropdown list, which will uniquely identify the data to provide data integrity and ensure that the receiver has an unmodified data from the one sent by the original host.

TLS Identicy Authentication	This option uses a static Pre-Shared Key (PSK) that must be generated in advance and shared among all peers.This feature adds extra protection to the TLS channel by requiring that incoming packets have a valid signature generated using the PSK key.
TLS Identity Authentication Direction	Select from the drop-down list the direction of TLS Identity Authentication, three options are available (Server, Client or Both).
TLS Pre-Shared Key	If TLS Identicy Authentication is enabled, enter the TLS Pre-Shared Key.
Allow Duplicate Client Certificates	Click on "ON" to allow duplicate Client Certificates
Redirect Gateway	When redirect-gateway is used, OpenVPN(R) clients will route DNS queries through the VPN, and the VPN server will need to handle them.
Push Routes	Specify route(s) to be pushed to all clients.Example: 10.0.0.1/8
LZO Compression Algorithm	Select whether to activate LZO compression or no, if set to "Adaptive", the server will make the decision whether this option will be enabled or no.
Allow Peer to Change IP	Allow remote change the IP and/or Port, often applicable to the situation when the remote IP address changes frequently.
CA Certificate	Select a generated CA from the dropdown list or add one.
Server Certificate	Select a generated Server Certificate from the dropdown list or add one.
IPv4 Tunnel Network/Mask Length	Enter the network range that the GWN70xx will be serving from to the OpenVPN(R) client.Note: The network format should be the following 10.0.10.0/16.The mask should be at least 16 bits.

Create OpenVPN(R) Server

- **Create the remote user credentials:**

To create the remote user account, which will be required to be entered on the client side and authenticated on the server side, please refer to the **Remote Users** section.

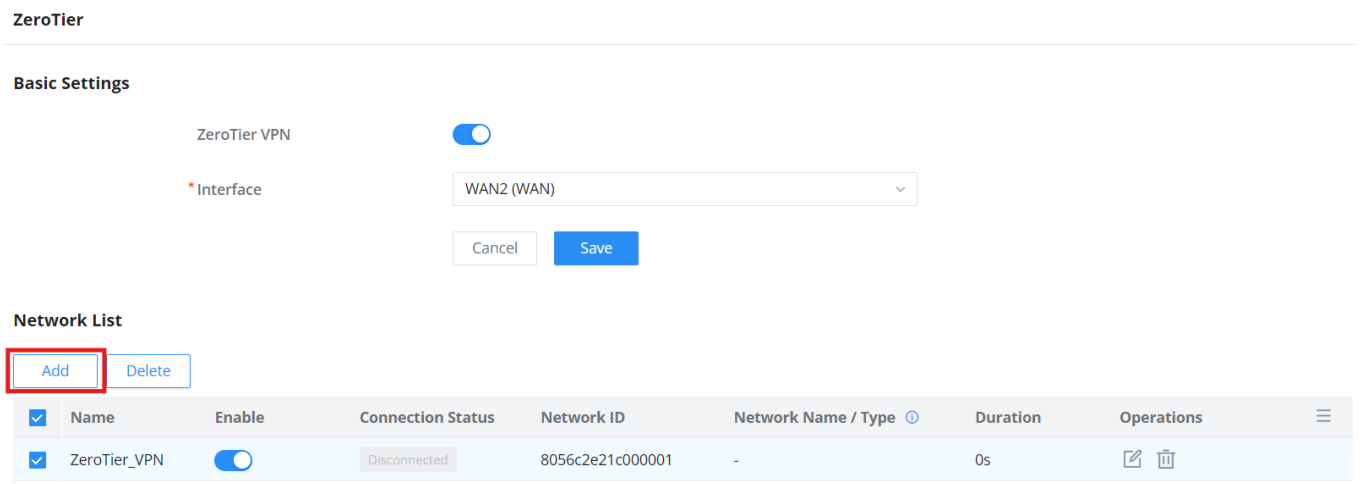
ZeroTier

ZeroTier is a secure, peer-to-peer virtual networking solution that allows devices in different physical locations to appear on the same local network. It simplifies remote access and interconnectivity across NATs and firewalls - without requiring port forwarding or static IPs.

Navigate to: **VPN -> ZeroTier**

Basic Settings - ZeroTier

- **ZeroTier VPN**: Toggle to enable/disable the service
- **Interface**: Choose the WAN interface to bind the ZeroTier tunnel (e.g., WAN1, WAN2)

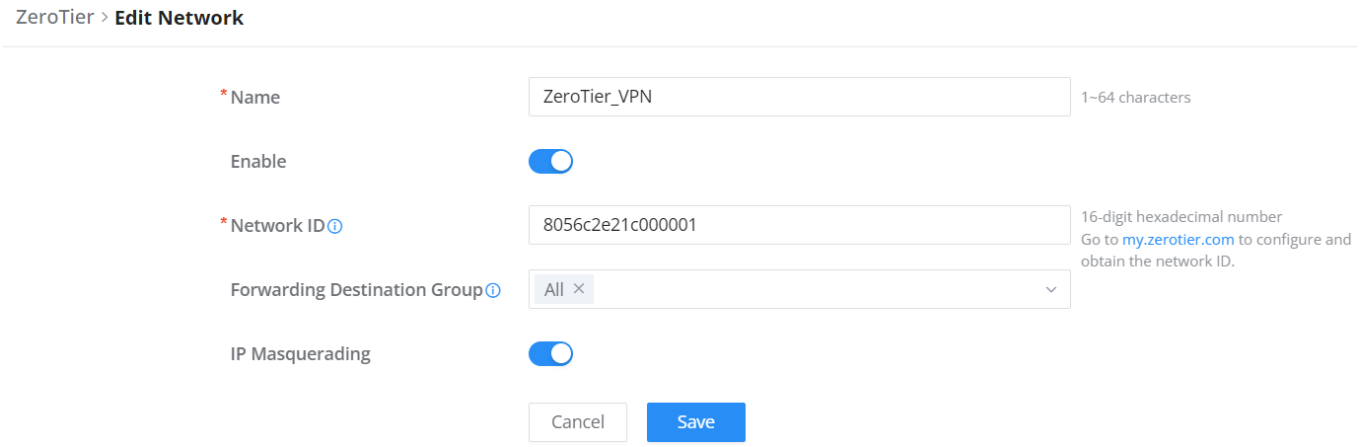


ZeroTier main page

Add a Network

Click **Add** to create a new virtual network entry.

Field	Description
Name	Custom network name (1-64 characters)
Network ID	16-digit hexadecimal ZeroTier network ID (created via my.zerotier.com)
Forwarding Destination Group	Select which routing group to forward traffic to
IP Masquerading	Enable to allow NAT for this virtual network



ZeroTier AddEdit network

Best Practice

For best results:

- Enable IP Masquerading when accessing internet-bound devices
- Only enable known and secure network IDs
- Refer to your ZeroTier Central account for full network creation, member control, and routing rules

For step-by-step instructions, real-world use cases, and best practices on setting up ZeroTier across supported GCC60xx devices, please refer to the official configuration guide: **ZeroTier Configuration Guide**

PPTP

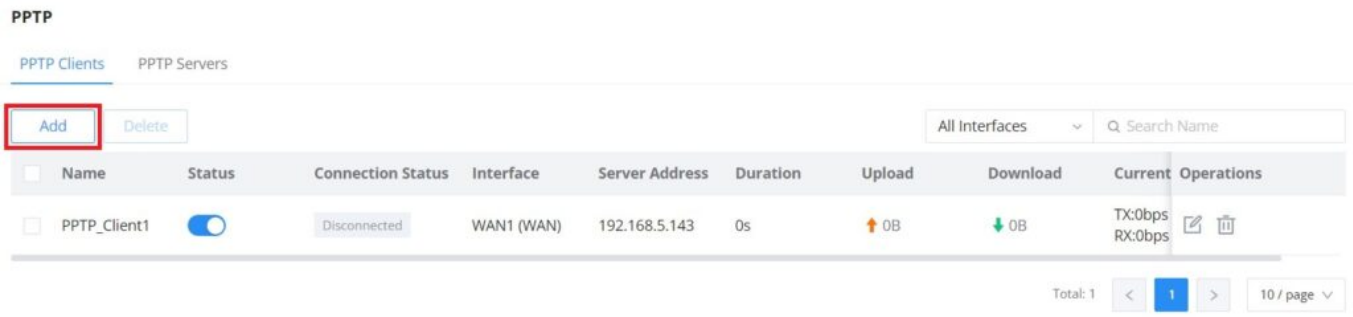
A data-link layer protocol for wide-area networks (WANs) based on the Point-to-Point Protocol (PPP) and

developed by Microsoft, enables network traffic to be encapsulated and routed over an unsecured public network such as the Internet. Point-to-Point Tunneling Protocol (PPTP) allows the creation of virtual private networks (VPNs), which tunnel TCP/IP traffic through the Internet.

PPTP Clients

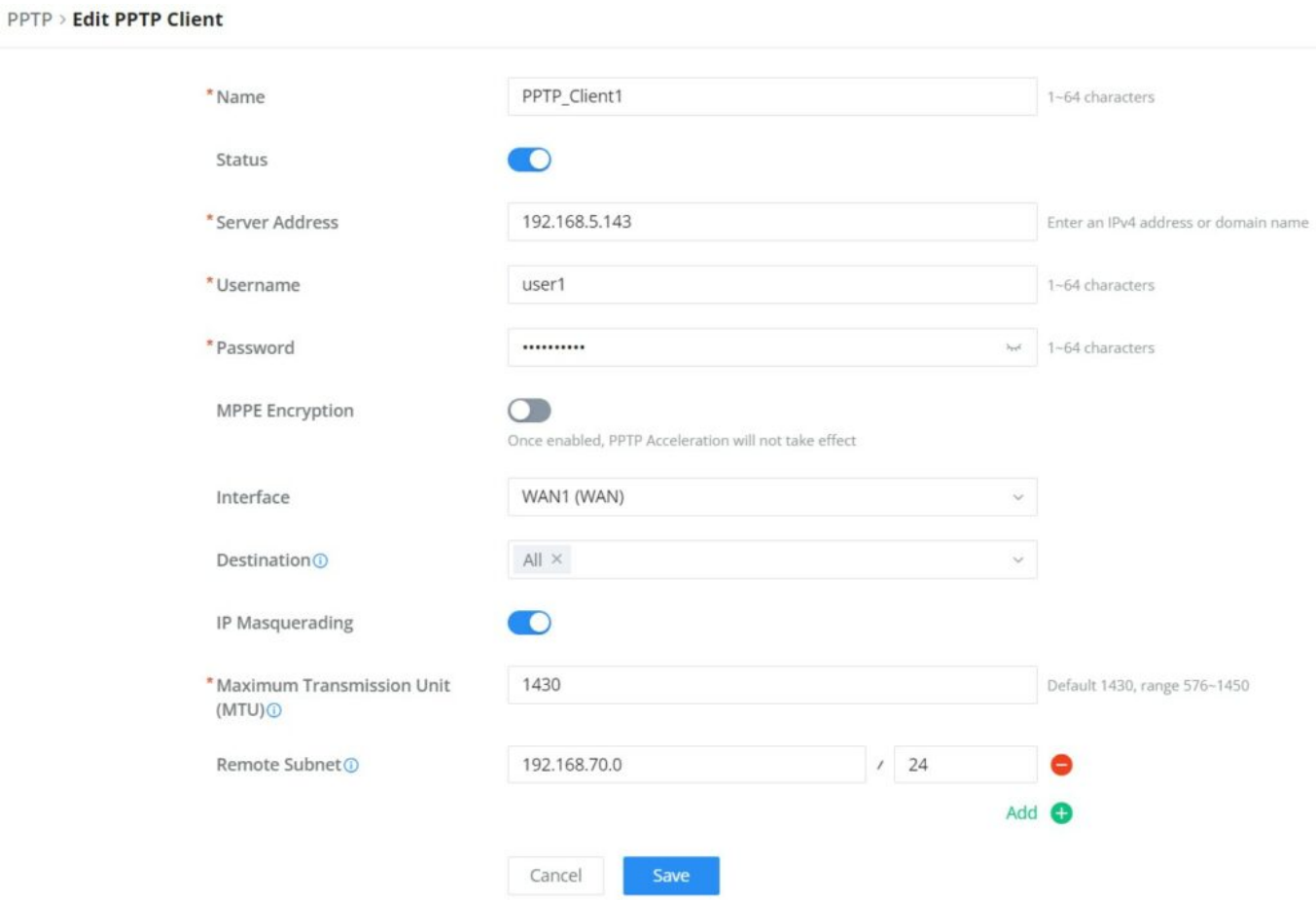
To configure the PPTP client on the GCC602x, navigate to **VPN -> PPTP -> PPTP Clients** and set the following:

1. Click on the "**Add**" button.



PPTP page

The following window will pop up.



PPTP Client Configuration

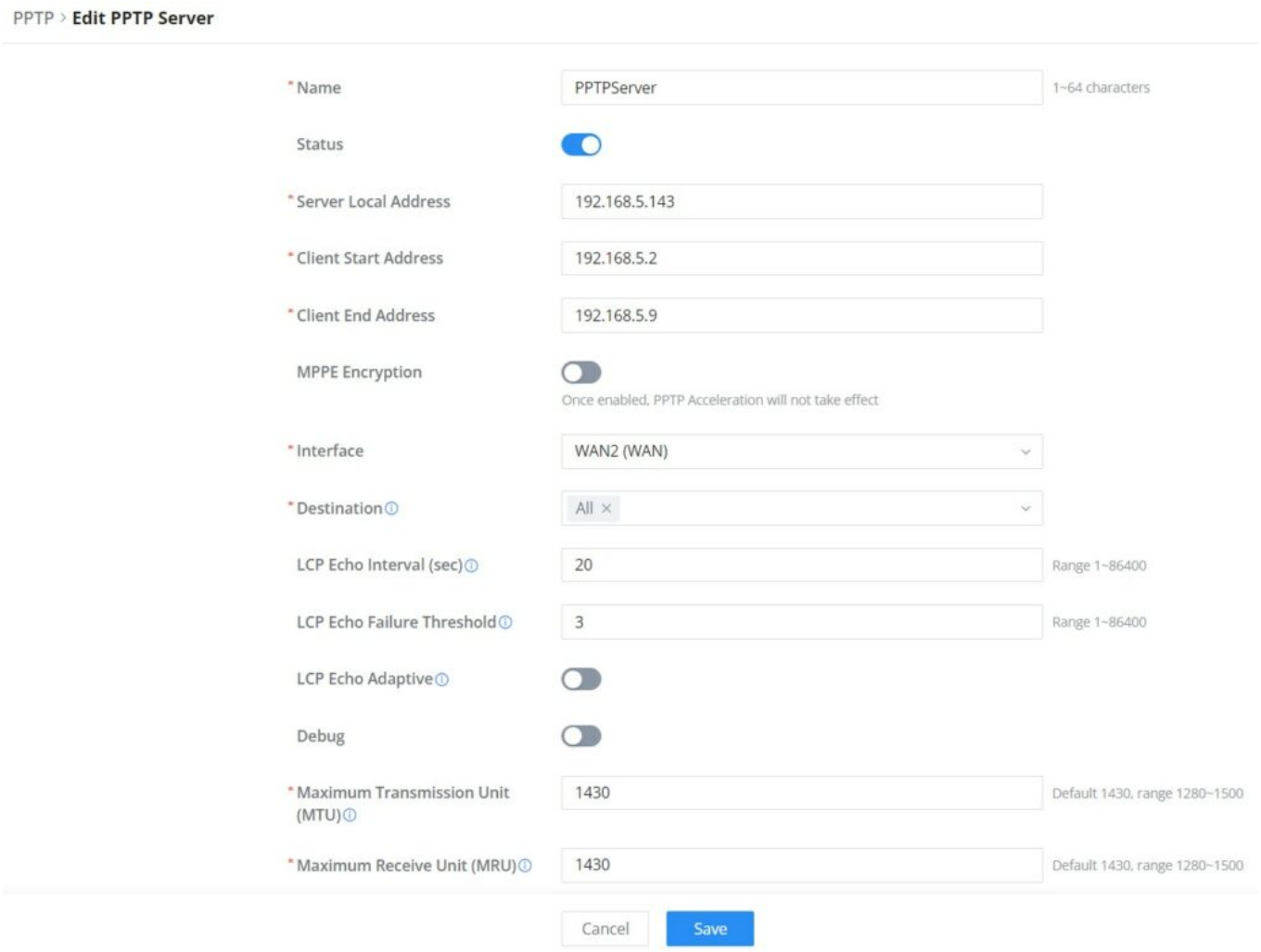
Name	Enter a name for the PPTP client.
Status	Toggle on/off the VPN client account.
Server Address	Enter the IP/Domain of the remote PPTP Server.
Username	Enter the Username for authentication with the VPN Server.

Password	Enter the Password for authentication with the VPN Server.
Interface	Choose the interfaces.Note: Set forwarding rules in firewall automatically to allow traffic forwarded from VPN to the selected WAN port. If remote device is allowed to access, please set the corresponding forwarding rules in firewall.
Forwarding Destination Group	Choose to which destination group or WAN to allow traffic from the VPN, this will generate automatically a forwarding rule under the menu Firewall -> Traffic Rules -> Forward.
Remote Subnet	Configures the remote subnet for the VPN.The format should be "IP/Mask" where IP could be either IPv4 or IPv6 and mask is a number between 1 and 32.example: 192.168.5.0/24
MPPE Encryption	Enable / disable the MPPE for data encryption.By default, it's disabled.
IP Masquerading	This feature is a form of network address translation (NAT) which allows internal computers with no known address outside their network, to communicate to the outside. It allows one machine to act on behalf of other machines.
Maximum Transmission Unit (MTU)	This indicates the size of the packets sent by the router. Please do not change this value unless necessary.

PPTP Client Configuration

PPTP Servers

To add a PPTP Server, please navigate to **Web UI -> VPN -> PPTP page -> PPTP Servers tab**, then click on the "**Add**" button.



PPTP Server

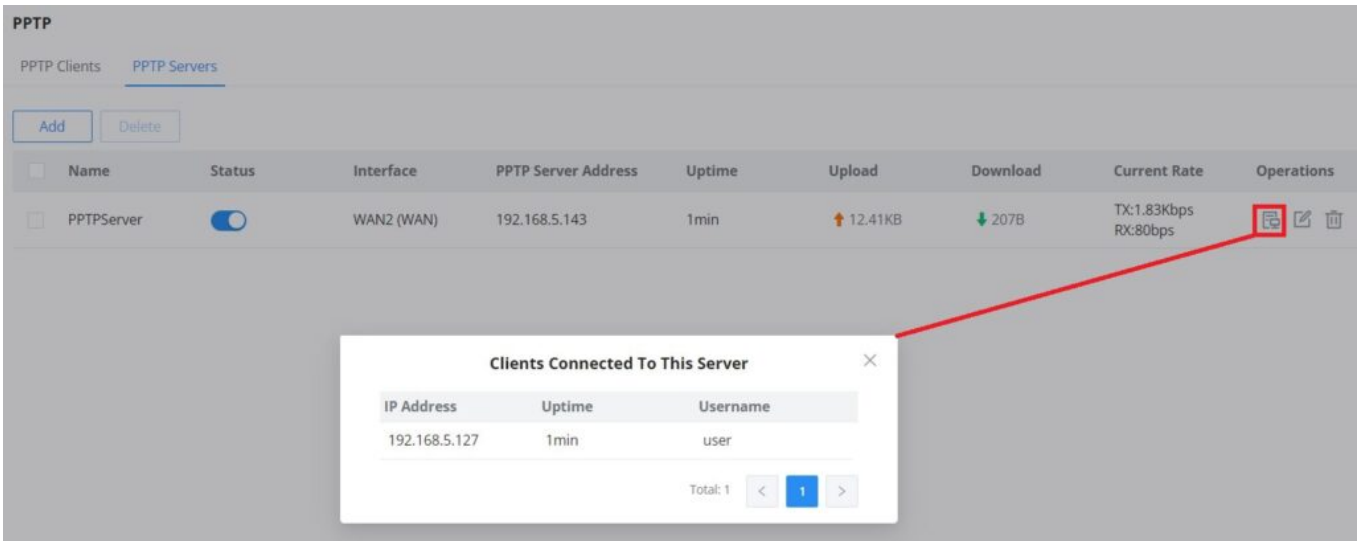
Name	Enter a name for the PPTP Server.
Enable	Toggle ON or OFF to enable or disable the PPTP Server VPN.
Client Address Type	Used to select the IP address source method for PPTP clients after they connect.Custom: Enter the address and the subnet manually.Local Subnet: Select one of the LAN created.
Local Subnet?	Select the local subnet for the VPN clients.
Server Local Address	Specify the server local address
Client Start Address	specify client start IP address
Client End Address	specify client end IP address
Interface	Select from the drop-down list the exact interface (WAN port).
Forwarding Destination Group	Select the Destination from the drop-down list (WAN or VLAN).Note: When selecting "All", subsequent new interfaces will be automatically included.
MPPE Encryption	Enable / disable the MPPE for data encryption.By default, it's disabled.
LCP Echo Interval (sec)	Configures the LCP echo send interval.
LCP Echo Failure Threshold	Set the maximum number of Echo transfers. If it is not answered within the set request frames, the PPTP server will consider that the peer is disconnected and the connection will be terminated.
LCP Echo Adaptive	Once enabled: LCP Echo request frames will only be sent if no traffic has been received since the last LCP Echo request.Once disabled: the traffic will not be checked, and LCP Echoes are sent based on the value of the LCP echo interval
Debug	Toggle On/Off to enable or disable debug.
Maximum Transmission Unit (MTU)	This indicates the size of the packets sent by the router. Please do not change this value unless necessary. By default is 1430.
Maximum Receive Unit (MRU)	MRU indicates the size of the received packets. By default is 1430.
Preferred DNS Server	specify the preferred DNS server. Ex: 8.8.8.8
Alternative DNS Server	specify the alternative DNS server. Ex: 1.1.1.1

PPTP Server

- **Create the remote user credentials:**

To create the remote user account, which will be required to be entered on the client side and authenticated on the server side, please refer to the **Remote Users** section.

To view the clients connected to this server, click on the "**Client List**" icon as shown below:



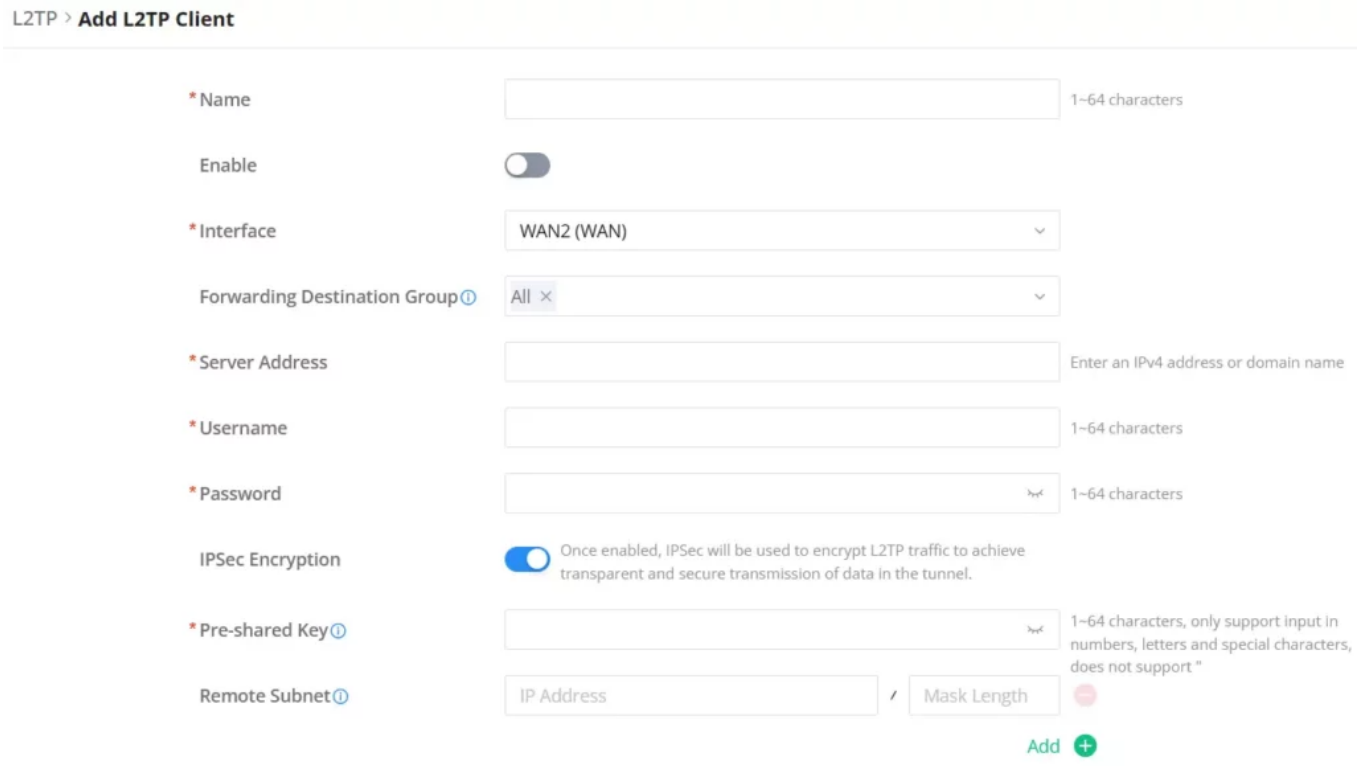
Clients connected to this server

L2TP

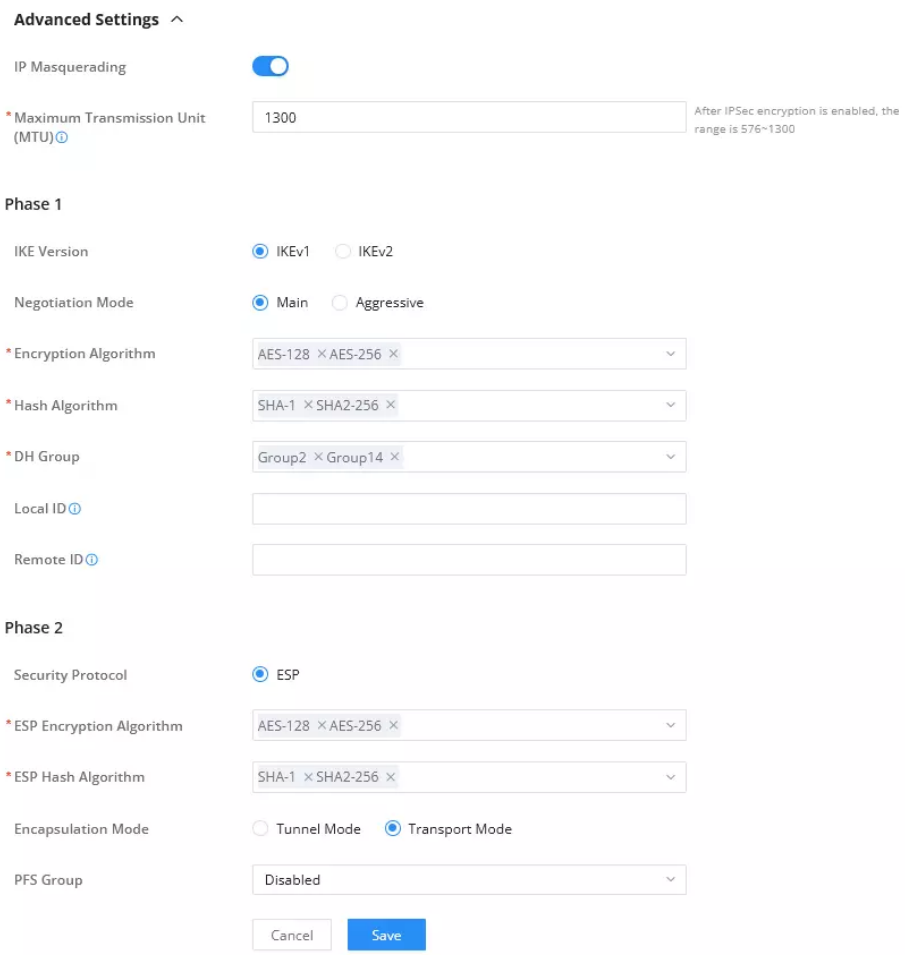
The L2TP Client allows secure tunneling to a remote L2TP server. This interface includes support for **IPSec Encryption**, offering enhanced security and configurable Phase 1/Phase 2 parameters.

To configure the L2TP client on the GCC6020 device, navigate under **"VPN -> VPN Clients"** and set the following:

1. Click on the "**Add**" button, and the following window will pop up.



L2TP Client Configuration part 1



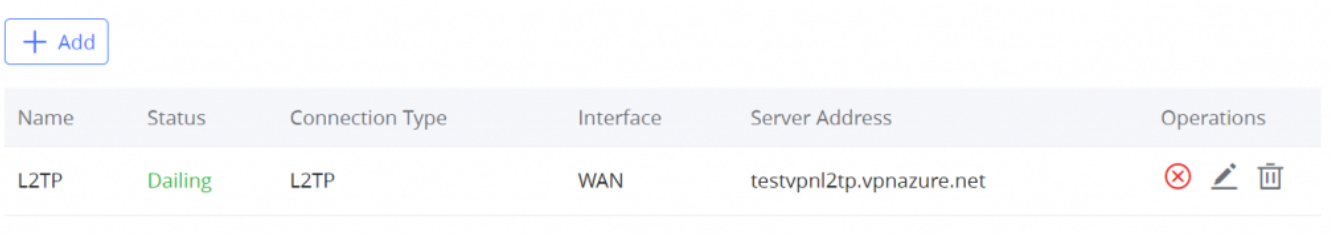
L2TP Client Configuration part 2

Field	Description
Name	Set a name for the L2TP connection (1-64 characters).
Enable	Toggle to activate or deactivate the L2TP client.
Interface	Select the WAN interface used for the connection.
Forwarding Destination Group	Choose a group to forward traffic to after tunnel connection.
Server Address	Enter the domain or IP address of the remote L2TP server.
Username	Provide the username for L2TP authentication.
Password	Enter the L2TP authentication password.
IPSec Encryption	Enable to encrypt traffic over the L2TP tunnel using IPSec. Automatically adjusts MTU to 1300.
Pre-shared Key	Required if IPSec is enabled. Must match the key configured on the L2TP server.
Remote Subnet	Specify the subnet (IP/mask) on the remote network.
Advanced Settings	
IP Masquerading	Enable NAT for outbound traffic from the VPN tunnel.
Maximum Transmission Unit (MTU)	Set the MTU size (Range: 576-1300 when IPSec is enabled).
IKE Version	Choose IKEv1 or IKEv2 for key negotiation.
Negotiation Mode	Select 'Main' or 'Aggressive' mode for Phase 1.
Encryption Algorithm	Set preferred encryption methods for Phase 1.
Hash Algorithm	Choose hashing algorithms for Phase 1.

DH Group	Define the Diffie-Hellman group(s) for key exchange.
Local ID	Optional: Enter an identifier for the local endpoint.
Remote ID	Optional: Enter the identifier for the remote endpoint.
Security Protocol	Set to ESP (Encapsulating Security Payload) for data encryption.
ESP Encryption Algorithm	Select encryption algorithms for Phase 2.
ESP Hash Algorithm	Set hashing methods for Phase 2.
Encapsulation Mode	Choose between Tunnel or Transport mode.
PFS Group	Enable and set Perfect Forward Secrecy (optional).

L2TP Client Configuration

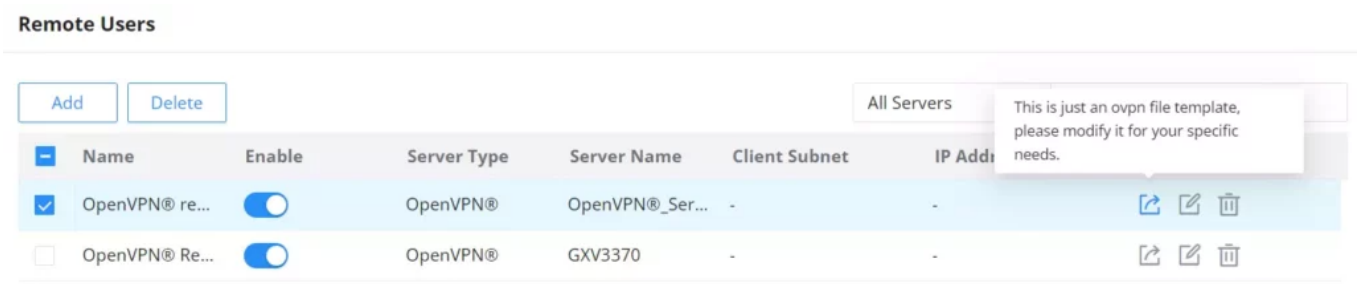
Click "**Save**" after completing all the fields.



L2TP Client

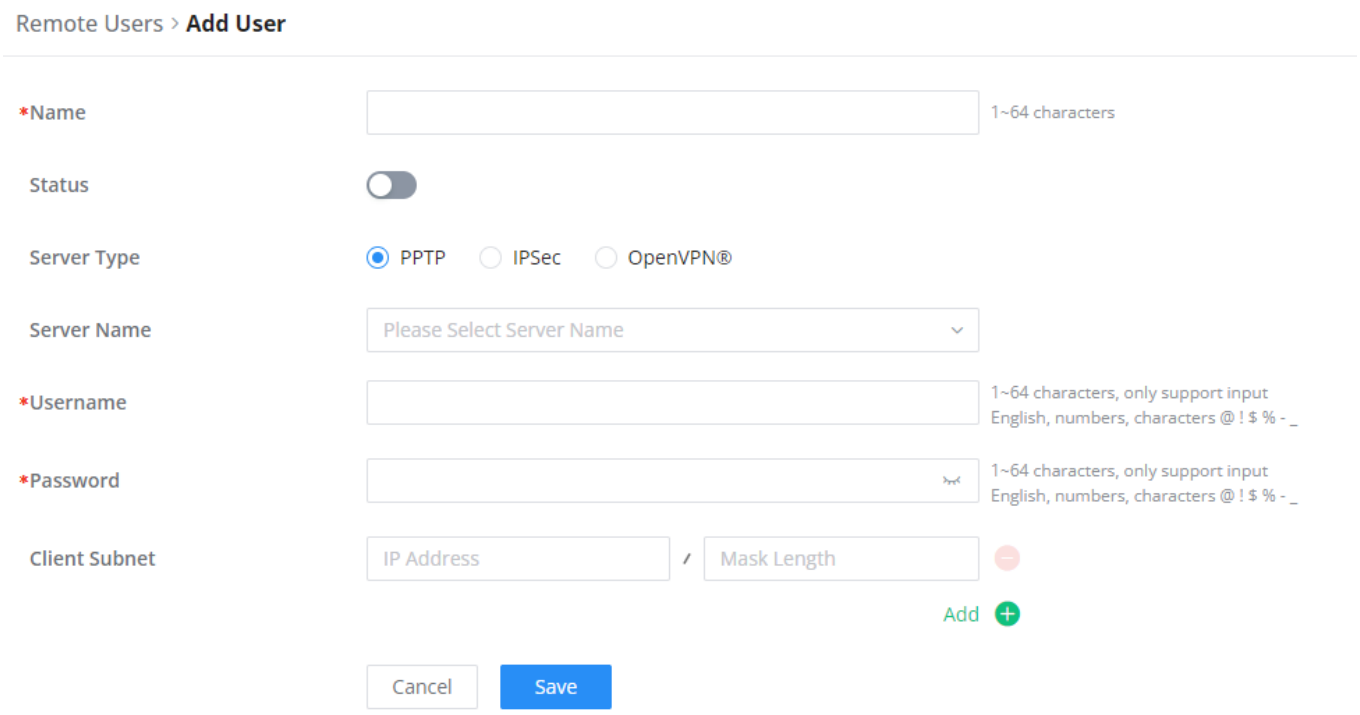
Remote Users

To create the VPN user accounts, please navigate to **VPN -> Remote Users,** then click "Add". The account configured will be used for the client to authenticate to the VPN server. The remote client user that can be created in this section is for PPTP, IPSec, and OpenVPN.



VPN Remote Users page

If the remote user is using OpenVPN(R), the configuration file can be exported as an .ovpn file. This file can then be modified as needed to fit the user's requirements.



Add VPN Remote Users

Name	Enter a name for the user. This name will not be used to log in.
Status	Enable or disable this account.
Server Type	Choose the type of the server. PPTP IPSec OpenVPN
Server Name	Enter the server's name.
Username	Enter the username. This username will be used to log in.
Password	Enter the password.
Client Subnet	Specify the client subnet.

Add VPN Remote Users

To authenticate a remote user into the VPN server successfully, the username and password are used alongside the client certificate. To create a client certificate, please refer to the Certificates section.

To configure the VPN clients for each VPN server type, please refer to the respective VPN client configuration above.

ROUTING

Routing Table

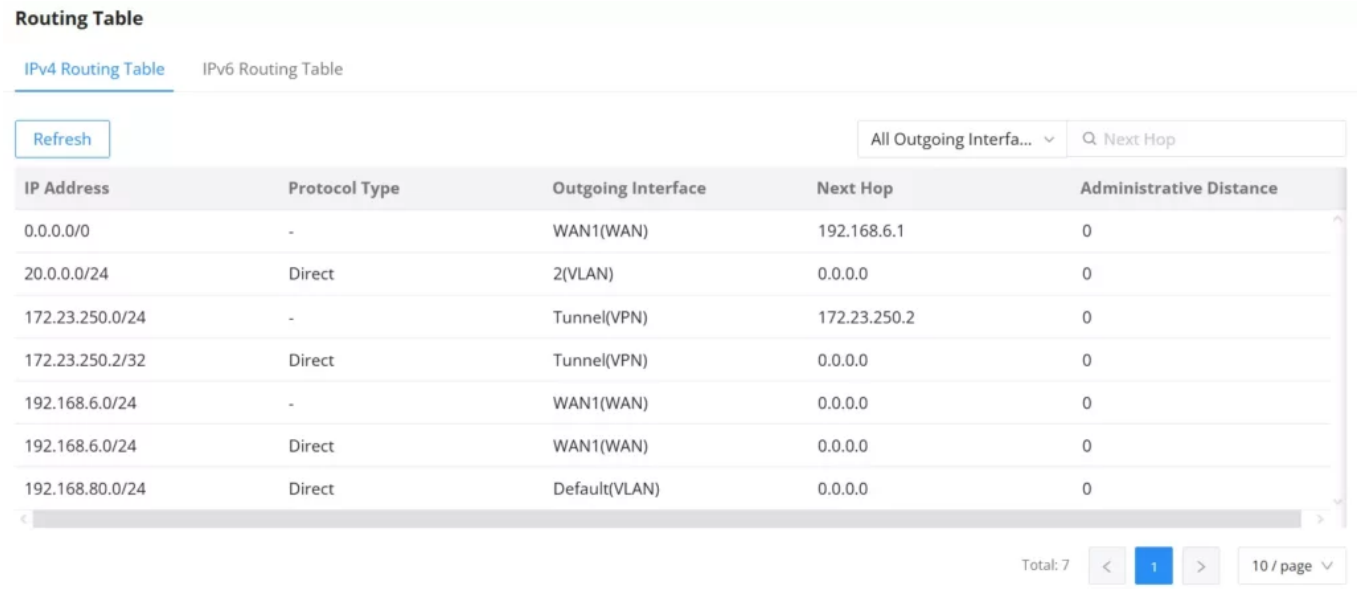
The **Routing Table** page displays the routes currently configured on your Grandstream device. It shows key information such as the IP address, protocol type, outgoing interface, next hop, and administrative distance for each route.

You can toggle between **IPv4 Routing Table** and **IPv6 Routing Table** using the tabs at the top of the page. Additionally, you can filter routes based on outgoing interfaces or search for a specific next hop.

- **IP Address**: The destination network or IP address.
- **Protocol Type**: Indicates the type of routing (e.g., Direct, Static, VPN).
- **Outgoing Interface**: The network interface used for routing traffic to the destination.

- **Next Hop**: The IP address of the next device in the routing path.
- **Administrative Distance**: The trustworthiness of the route.

To view the routing table, navigate to **Routing -> Routing Table**.



Routing Table

Policy Routes

In this section, the user can create a policy route to either load balance or backup (Failover) between 2 or more WAN ports. This feature allows a network administrator to make advanced routing decisions for traffic passing through the router and for high granularity control over policies that dictate what WAN port and even VLAN traffic should use. Traffic controlled this way can be balanced across multiple VLANs.

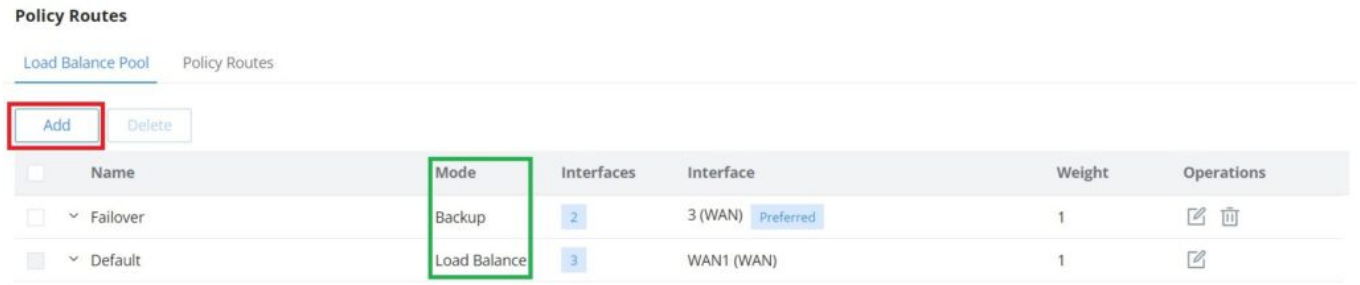
Load Balance Pool

To create a load balance rule, navigate to the Routing -> Policy Routes page -> Load Balance Pool tab, click on the "Add" button, then select the mode (Load Balance or Backup). After selecting the WAN ports from the drop-down list, specify the load balancing strategy to use; the available options are:

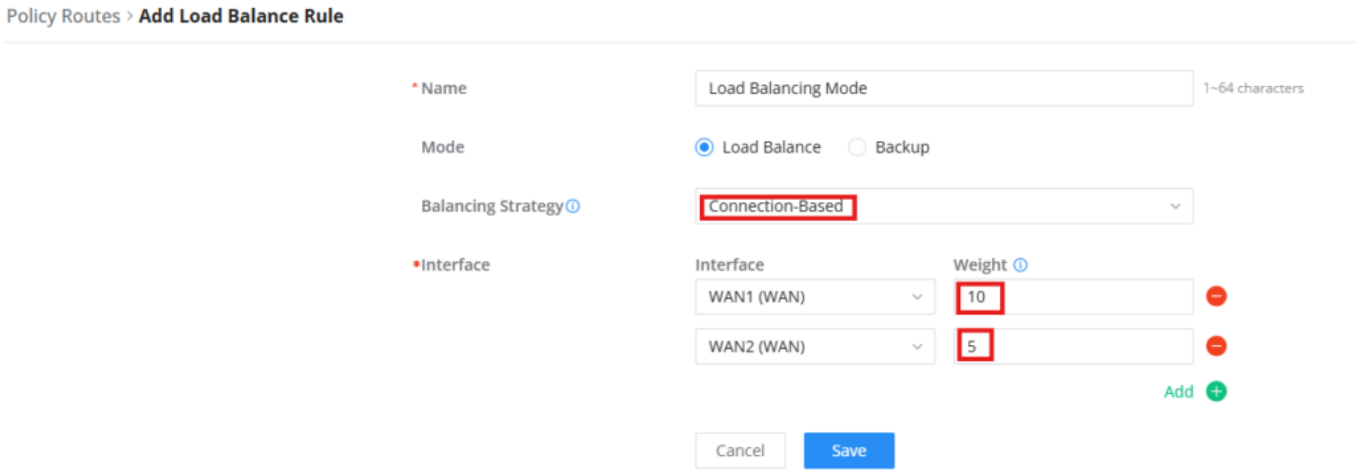
- **Connection-Based:** Traffic will be distributed evenly among the links and will rely on the weight values only to define the priority.
- **Source IP address:** Traffic will be distributed to the links based on the source IP address. Traffic from the same IP address will be routed through the same interface, reducing potential network issues.
- **Source & Destination IP Addresses:** Traffic will be distributed to links based on the source IP address and destination IP address. Traffic with the same source IP address and destination IP address will be routed through the same interface.

In addition, specify the weight for each port added; the weight determines the priority for each interface, and the higher the weight, the higher the priority.

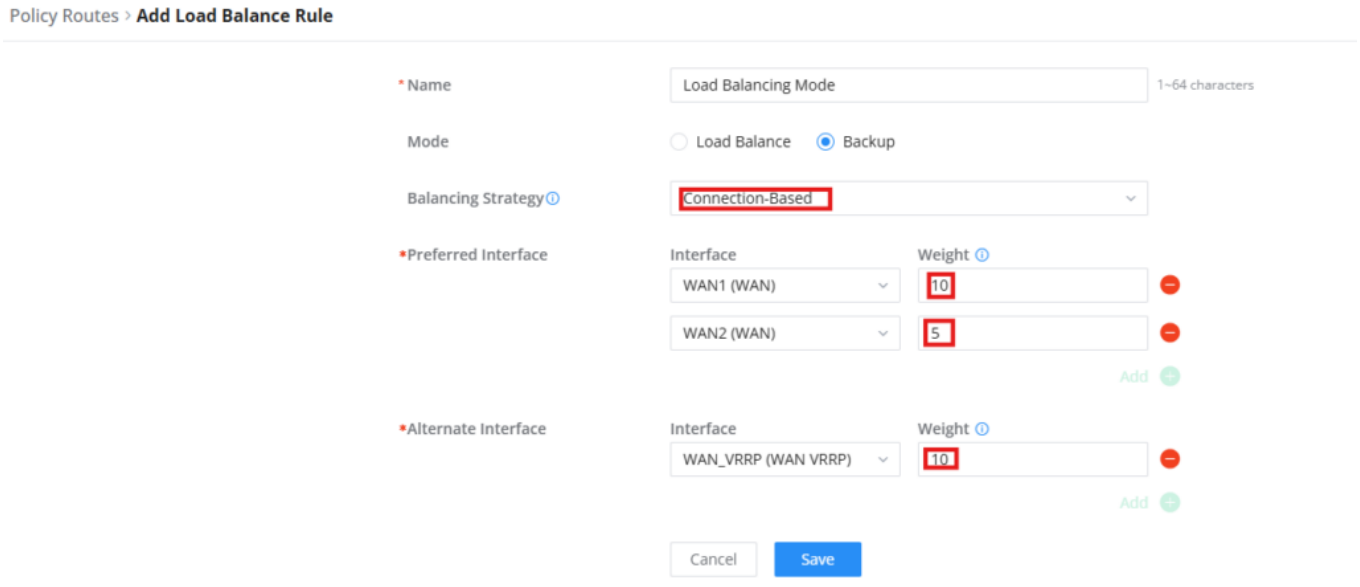
Please refer to the figures below:



Load Balance Pool



Load Balance Pool Load Balance mode



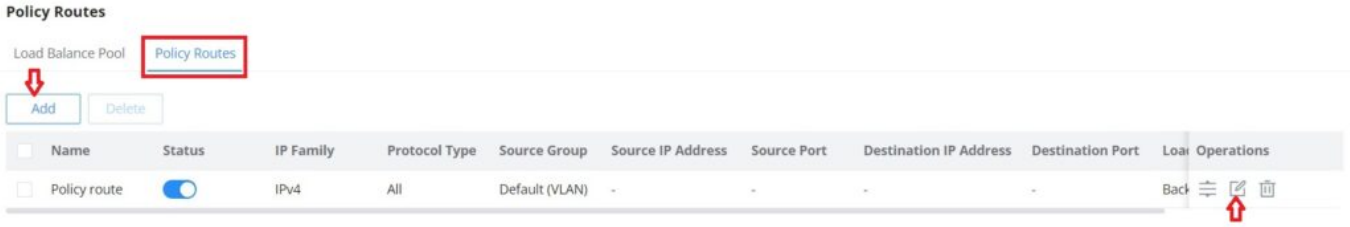
Load Balance Pool Backup mode

- For the Weight: The default is 1, and the value can be from 1~10, with 10 being the highest weight.
- The number of WAN ports depends on the device model.

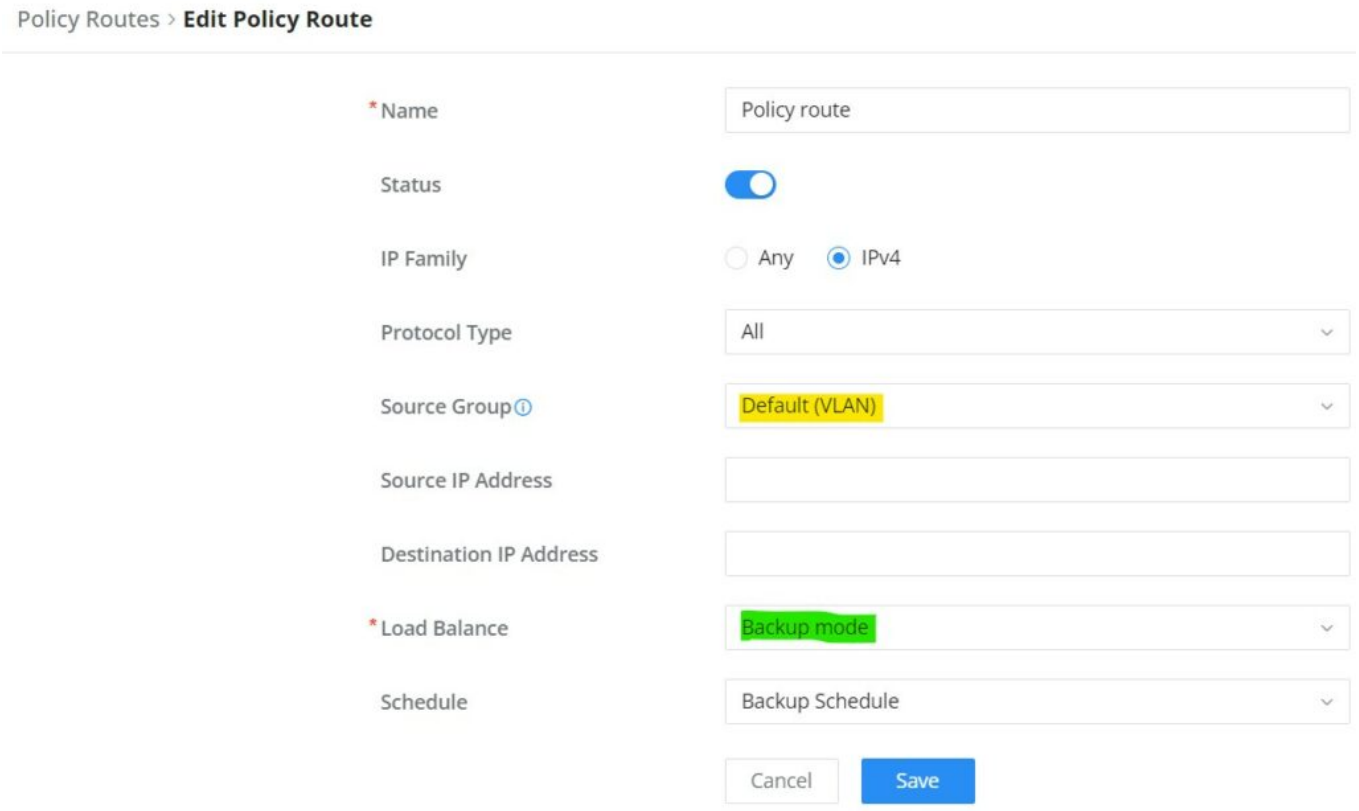
Policy Route

On the second tab (Policy Routes), the user can specify which Networks (VLANs) can use which Load Balance rule (must be created first); also, the user can specify the protocol type, source, and destination IP and even assign a schedule for it.

To create a Policy Route, please navigate to the **Routing -> Policy Routes page -> Policy Routes tab**, then click on the "**Add**" button as shown below:



Policy Routes page



Add Policy Route

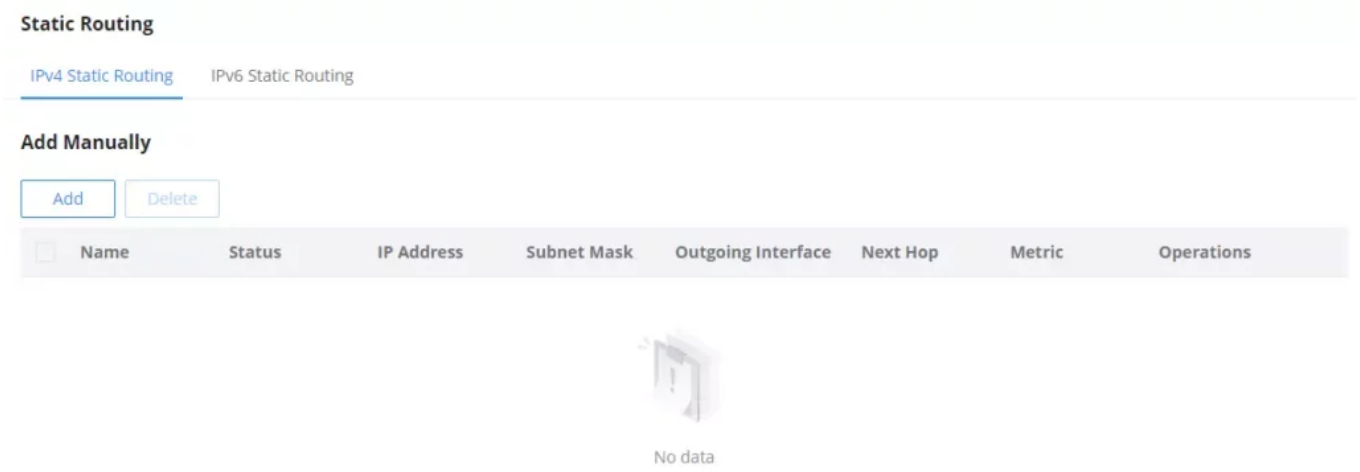
If the Source and Destination IP address fields are left empty, the policy route will take any IP address.

Static Routes

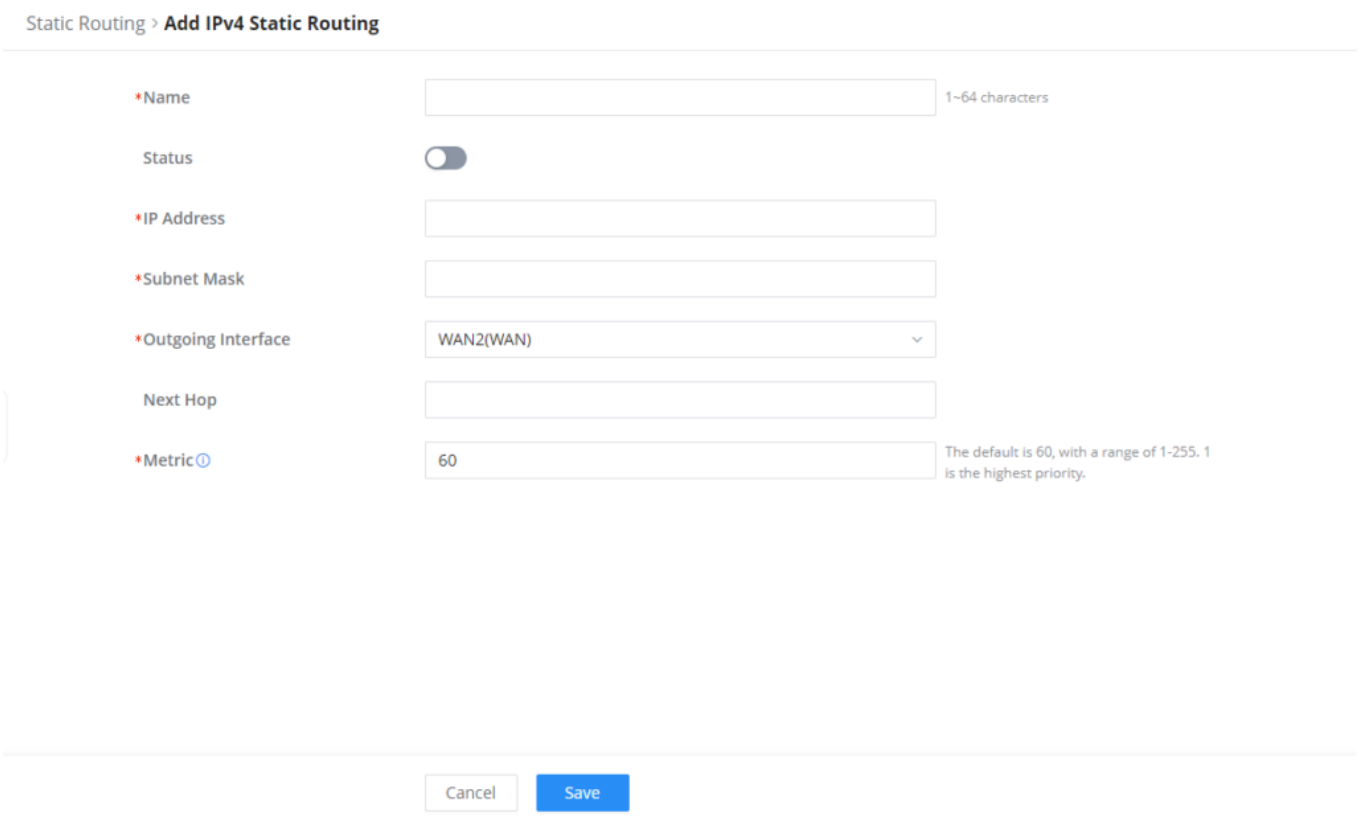
Static routing is a form of routing by manually configuring the routing entries, rather than using dynamic routing traffic for any service that requires a static address that never changes.

GCC602x supports setting IPv4 or IPv6 Static Routes, which can be accessed from GCC602x WebGUI **Routing -> Static Routing**.

To add a new Static Route, the user needs to click on .



Static Routing Page



Add IPv4 Static Routing

Name	Specify a name for the Static Routing
Status	enable or disable the Static Routing
IP Address	Specify the IP address
Subnet Mask	Enter the Subnet Mask

Outgoing Interface	Select the ougoing interface (WAN, VLAN or Blackhole).Note: Blackhole used to direct traffic destined for specific locations to a blackhole (i.e., a virtual drop point), where the traffic will be discarded instead of being forwarded to any destination.
Next Hop	Specify the next Hop
Metric	When there are multiple routings in the network that can reach the same destination, the priority of routing rules can be adjusted by setting metric, and the packets will be forwarded according to the path with the smallest metric.

Add IPv4 Static Routing

Open Shortest Path First (OSPF)

Open Shortest Path First (OSPF) is a dynamic routing protocol used in IP networks to determine the best path for data packets across the network. In Grandstream GCC6020 devices, OSPF allows for efficient routing across large and complex networks by exchanging routing information between routers, ensuring each router knows the most optimal path to various network destinations.

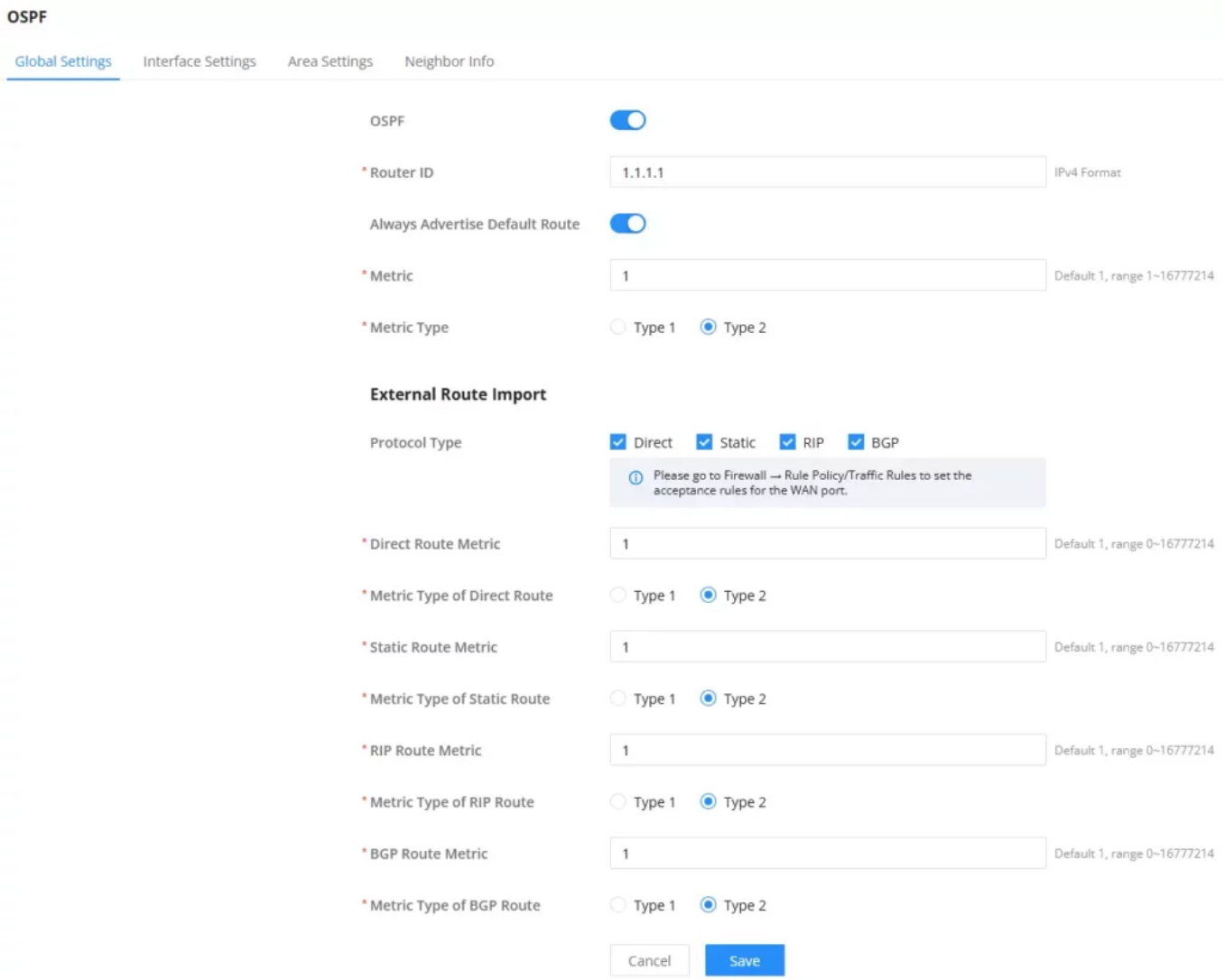
The GCC602x device supports a robust OSPF configuration to provide flexibility, security, and scalability for enterprise-level networks. OSPF is designed to work within an Autonomous System (AS), ensuring fast convergence and optimal routing decisions based on link state information.

To view or configure OSPF settings, navigate to **Routing -> OSPF.**

Global Settings

The **Global Settings** tab contains important configurations to enable and fine-tune OSPF on your Grandstream GCC6020 device. Some of the key options on this page include:

- **Router ID**: This field defines a unique IPv4 address that identifies your router within the OSPF network. It must be set for the router to participate in OSPF.
- **Always Advertise Default Route**: This toggle ensures that the router always advertises the default route (0.0.0.0/0) to other routers in the OSPF network, designating it as a gateway.
- **Metric**: The metric determines the cost of a route in OSPF. Lower values indicate a more preferred route, guiding the OSPF protocol in route selection.
- **Metric Type**: You can choose between:
    - **Type 1**: Considers both the OSPF metric and other route costs.
    - **Type 2**: Considers only the OSPF metric, typically used for external routes.
- **External Route Import**: This section allows you to import routes from other routing protocols such as **Direct**, **Static**, **RIP**, and **BGP**, giving you flexibility when integrating with different network setups.



OSPF Global Settings

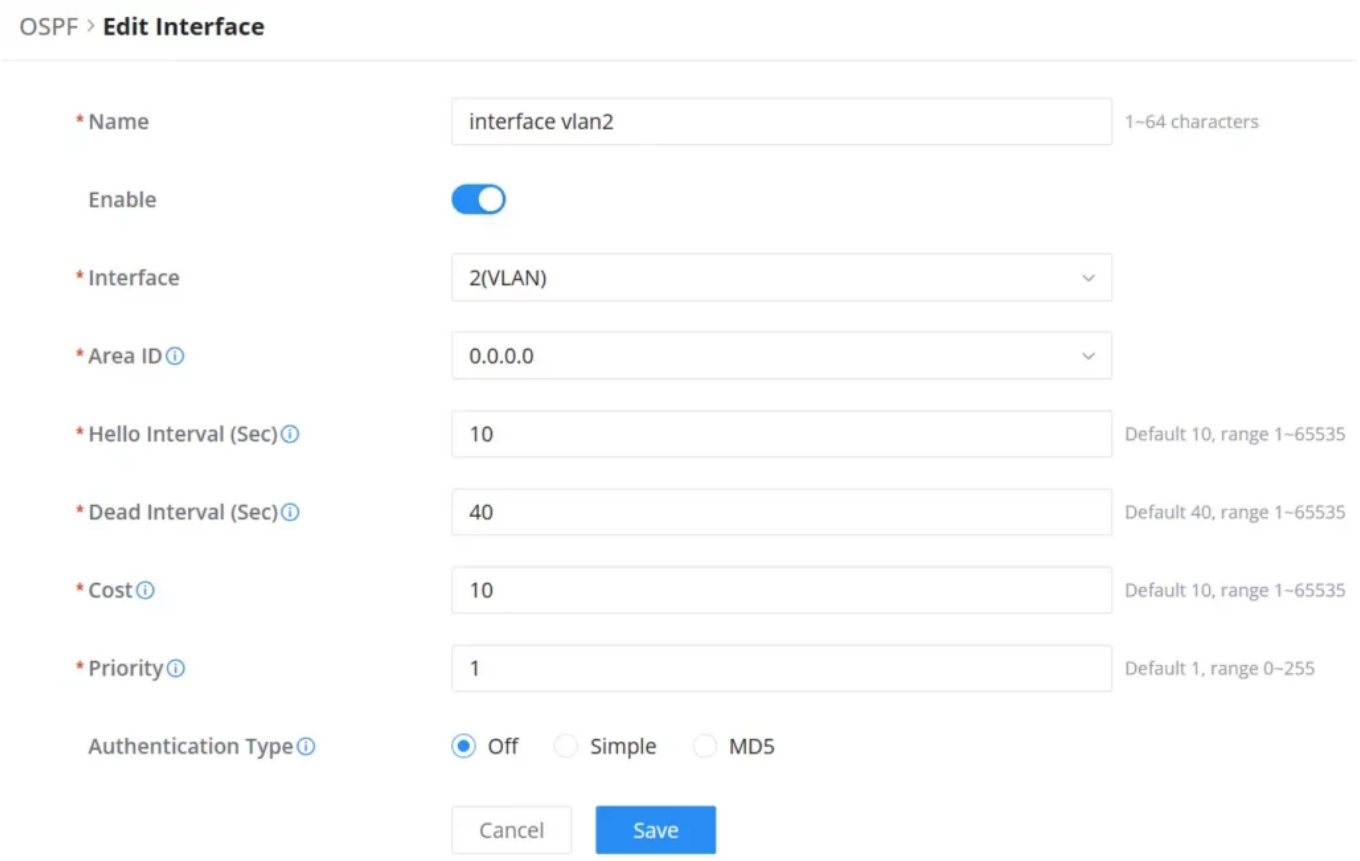
Interface Settings

In this section, users can view, add, or modify OSPF configurations for each interface on the device. The interface settings allow fine-tuning of OSPF behavior by defining key parameters like intervals for OSPF hello packets, authentication types, and the cost metric for each interface.

To navigate: **Routing** -> **OSPF** -> **Interface Settings**

OSPF Interface Settings page

To add a new OSPF interface, they can click on the **Add** button. To edit an existing interface, click on the **Edit** icon next to the interface. Refer to the images for a visual guide.



OSPF AddEdit Interface Settings

Key Configurations:

- **Name**: A customizable label for the interface.
- **Enable**: Toggle to enable or disable OSPF for this interface.
- **Interface**: Select the specific interface (e.g., VLAN) where OSPF should run.
- **Area ID**: Identifies the OSPF area the interface belongs to (default: 0.0.0.0 for backbone).
- **Hello Interval (Sec)**: The interval between OSPF Hello packets to maintain neighbor relationships (default: 10 seconds).
- **Dead Interval (Sec)**: The interval after which a neighbor is considered down if no Hello packet is received (default: 40 seconds).
- **Cost**: Determines the OSPF route cost; lower values are preferred.
- **Priority**: Controls the interface's eligibility to become the Designated Router (DR).
- **Authentication Type**: Choose between **No Authentication**, **Simple Password**, or **MD5 Authentication** for OSPF packets.

These configurations help ensure optimal routing behavior and secure communication between OSPF-enabled devices.

Area Settings

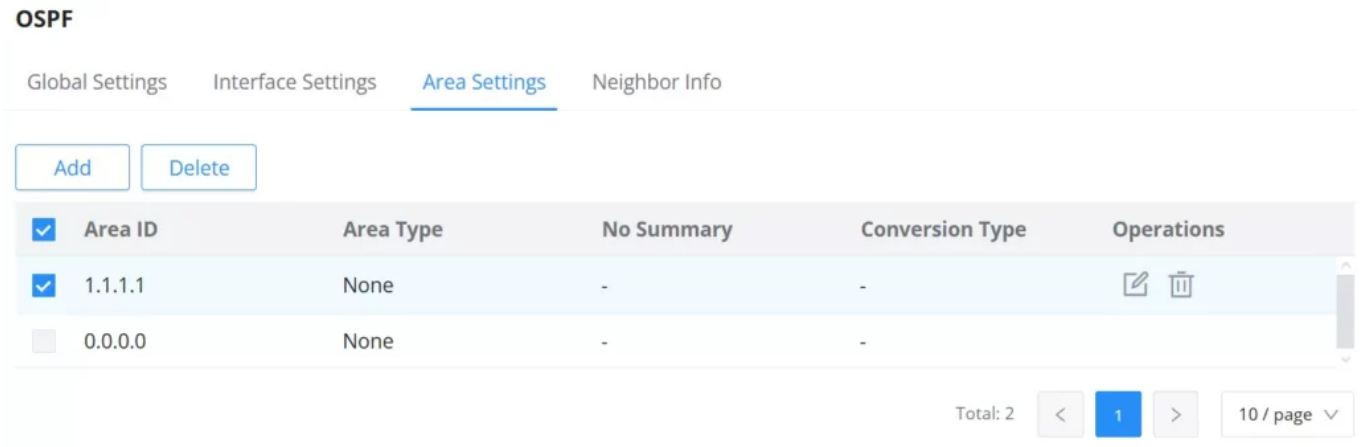
The OSPF **Area Settings** tab allows users to configure OSPF areas to optimize routing and control traffic within different network zones. This section is essential for network segmentation and ensuring efficient routing within the Open Shortest Path First (OSPF) protocol in the GCC602x device. OSPF divides networks into multiple areas to decrease routing overhead and enhance scalability.

To navigate to this page, go to **Routing -> OSPF -> Area Settings**.

To Add or Edit an Area:

- Click the **Add** button to create a new area.

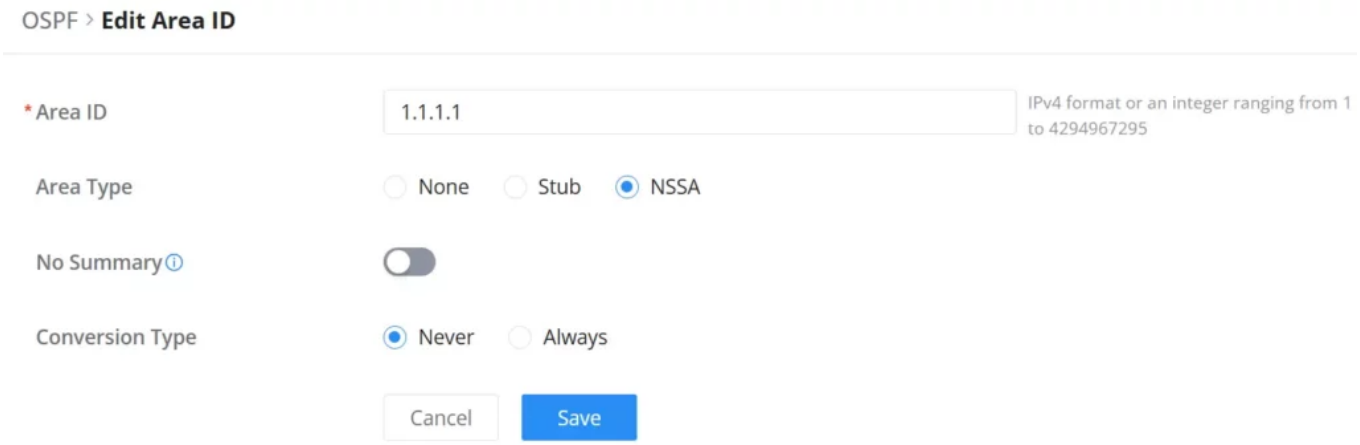
- Click the **Edit** icon next to an existing area to modify its configuration.



OSPF Area Settings page

Key Configurations in Area Settings:

- **Area ID**: A unique identifier for the OSPF area, defined in IPv4 format or an integer.
- **Area Type**: Options include:
  - **None**: No special designation for the area.
  - **Stub**: Restricts external route advertisements to minimize routing overhead.
  - **NSSA (Not-So-Stubby Area)**: Balances between a stub and full OSPF area by allowing specific external routes.
- **No Summary**: Prevents summarized routes from being sent into the area, promoting more specific routing information.
- **Conversion Type**: Manages area type conversions:
  - **Never**: Disables conversion.
  - **Always**: Enables automatic conversion.



OSPF AddEdit Area Settings

Neighbor Info

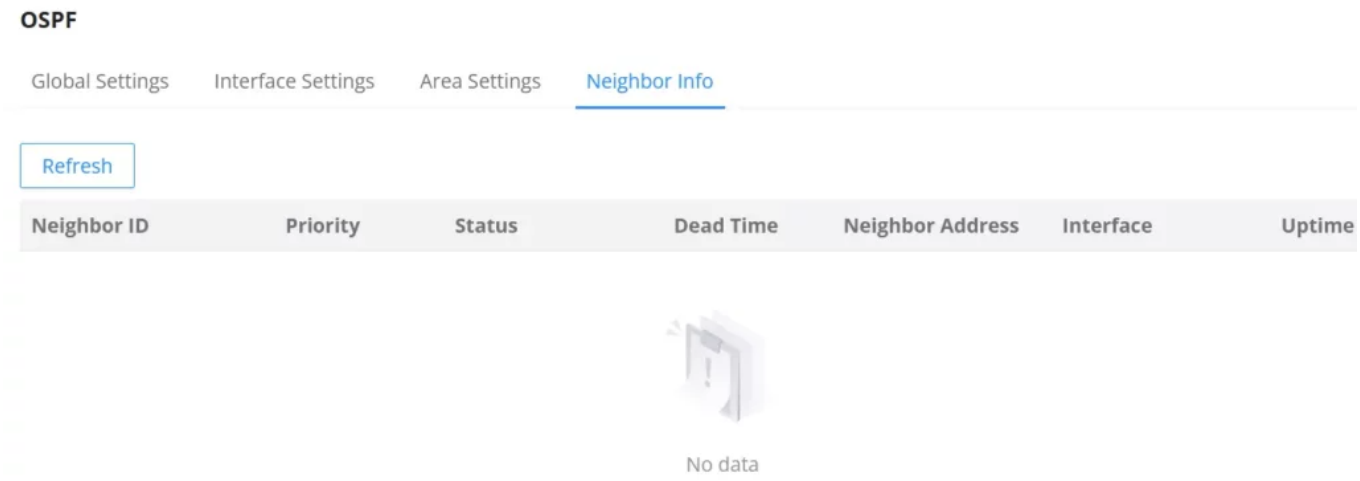
The **Neighbor Info** tab provides a summary of neighboring OSPF routers that have formed adjacencies with your Grandstream GCC6020 device. This feature helps monitor OSPF neighbor relationships and troubleshoot connectivity between routers in a network running OSPF.

To view this information, navigate to **Routing -> OSPF -> Neighbor Info**.

Key Parameters Displayed in Neighbor Info:

- **Neighbor ID**: The unique identifier of the neighboring router.
- **Priority**: Indicates the priority value of the neighbor, which helps in determining the designated router (DR) and backup designated router (BDR).
- **Status**: Shows the current state of the OSPF neighbor (e.g., Full, Init, 2-Way).
- **Dead Time**: The countdown before the neighbor is considered down, based on the Hello interval.
- **Neighbor Address**: The IP address of the neighbor.
- **Interface**: The interface on your router that is communicating with the neighbor.
- **Uptime**: The amount of time the OSPF neighbor relationship has been established.

This tab helps monitor OSPF relationships in real-time and identify potential routing issues.



OSPF Neighbor Info

RIP

Routing Information Protocol (RIP) is a distance-vector routing protocol used by routers to exchange routing information within a local network or across networks. In the GCC602x device, RIP allows the configuration of both RIP Version 1 (RIPv1) and RIP Version 2 (RIPv2) to determine how routers communicate route information, maintain updated routing tables, and ensure efficient network management.

The **RIP** section is divided into four main tabs:

1. **Global Settings**
2. **Interface Settings**
3. **Route Advertisement**
4. **Neighbor Info**

Each tab provides specific configurations for setting up and managing RIP routing on your network.

RIP - Global Settings

The **Global Settings** tab is where the general RIP configuration is defined. You can enable RIP, choose the RIP version, and configure important parameters such as RIP Distance, Timers, and External Route Import options.

To navigate to this section: Go to **Routing** -> **RIP** -> **Global Settings**.

- **RIP**: Toggle to enable or disable RIP on the GCC6020 device.
- **RIP Version**:

  - **RIPv1**: Basic, classful routing protocol, no subnet information.
  - **RIPv2**: Classless routing protocol with subnet and route tags support.
- **RIP Distance**: Specifies the administrative distance for RIP routes, which helps in determining the reliability of the route (default is 120).
- **Always Advertise Default Route**: When enabled, the router will always advertise a default route to other routers.

Timer Configuration:

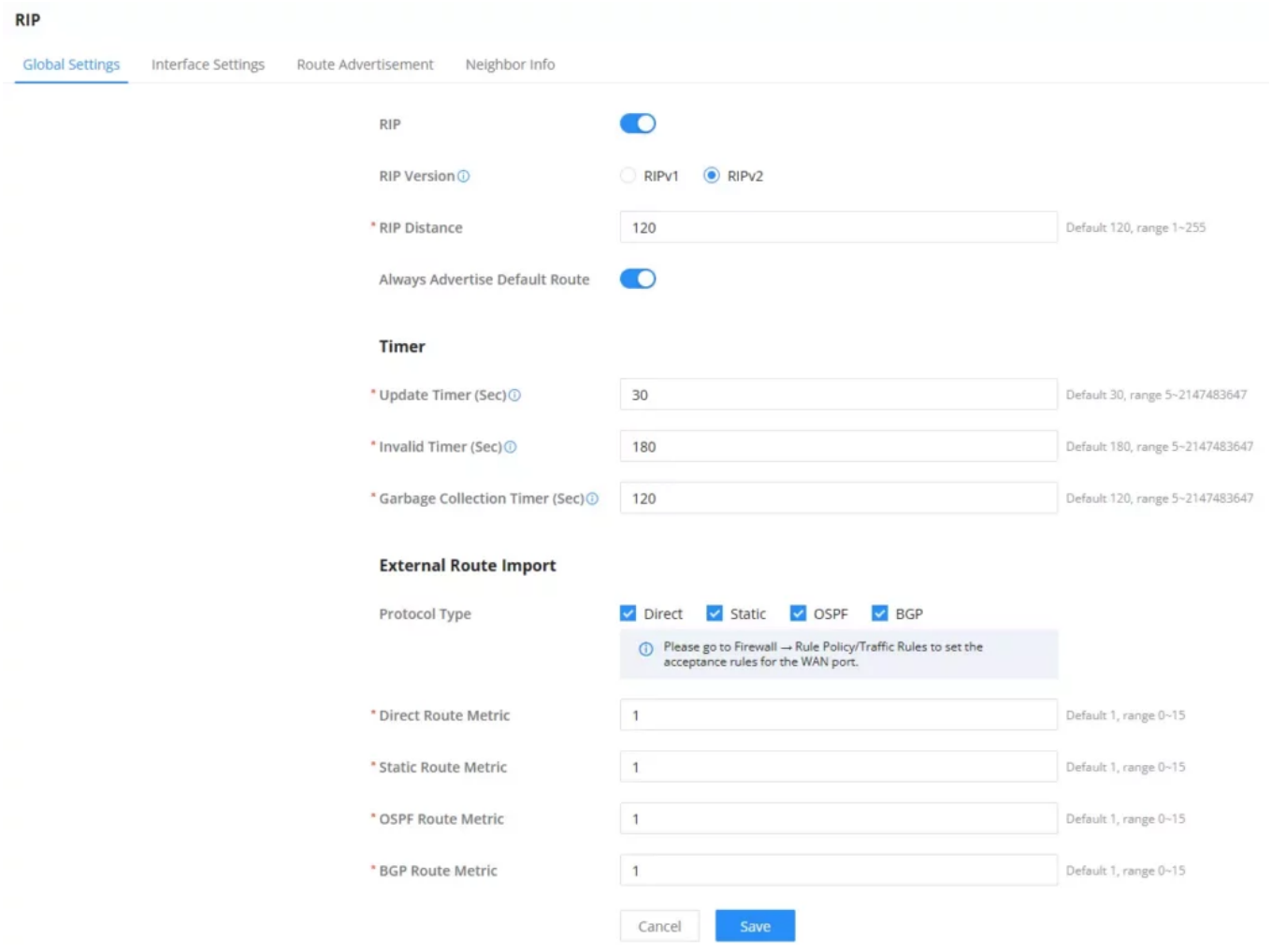
- **Update Timer**: The interval (in seconds) between route update messages.
- **Invalid Timer**: The duration (in seconds) after which a route is considered invalid if no update has been received.
- **Garbage Collection Timer**: The time after which an invalid route is removed from the routing table.

External Route Import:

You can configure the router to import external routes from the following sources:

- **Direct Routes**
- **Static Routes**
- **OSPF Routes**
- **BGP Routes**

For each protocol type, you can configure the metric values that affect the priority of the route.

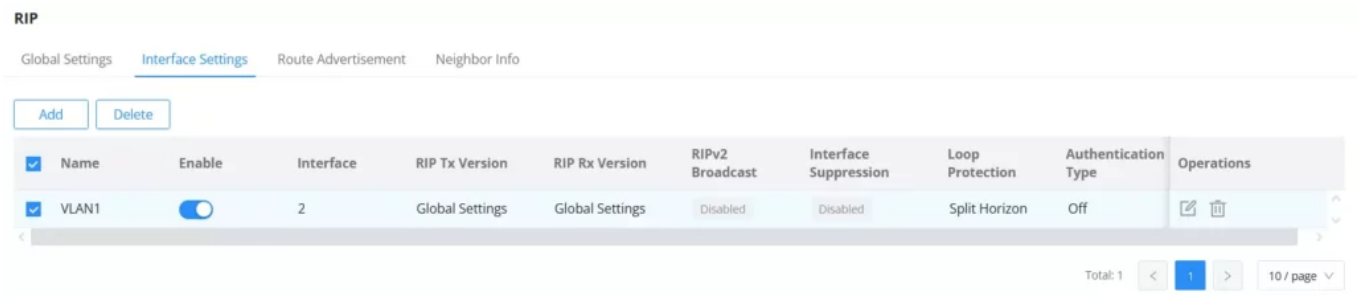


RIP Global Settings

RIP - Interface Settings

The **RIP Interface Settings** tab allows users to configure RIP interfaces on the GCC6020 device. It displays a list of interfaces that can participate in the RIP routing protocol. Users can manage settings like the RIP version used for transmitting and receiving, authentication types, and other advanced options for RIP routing.

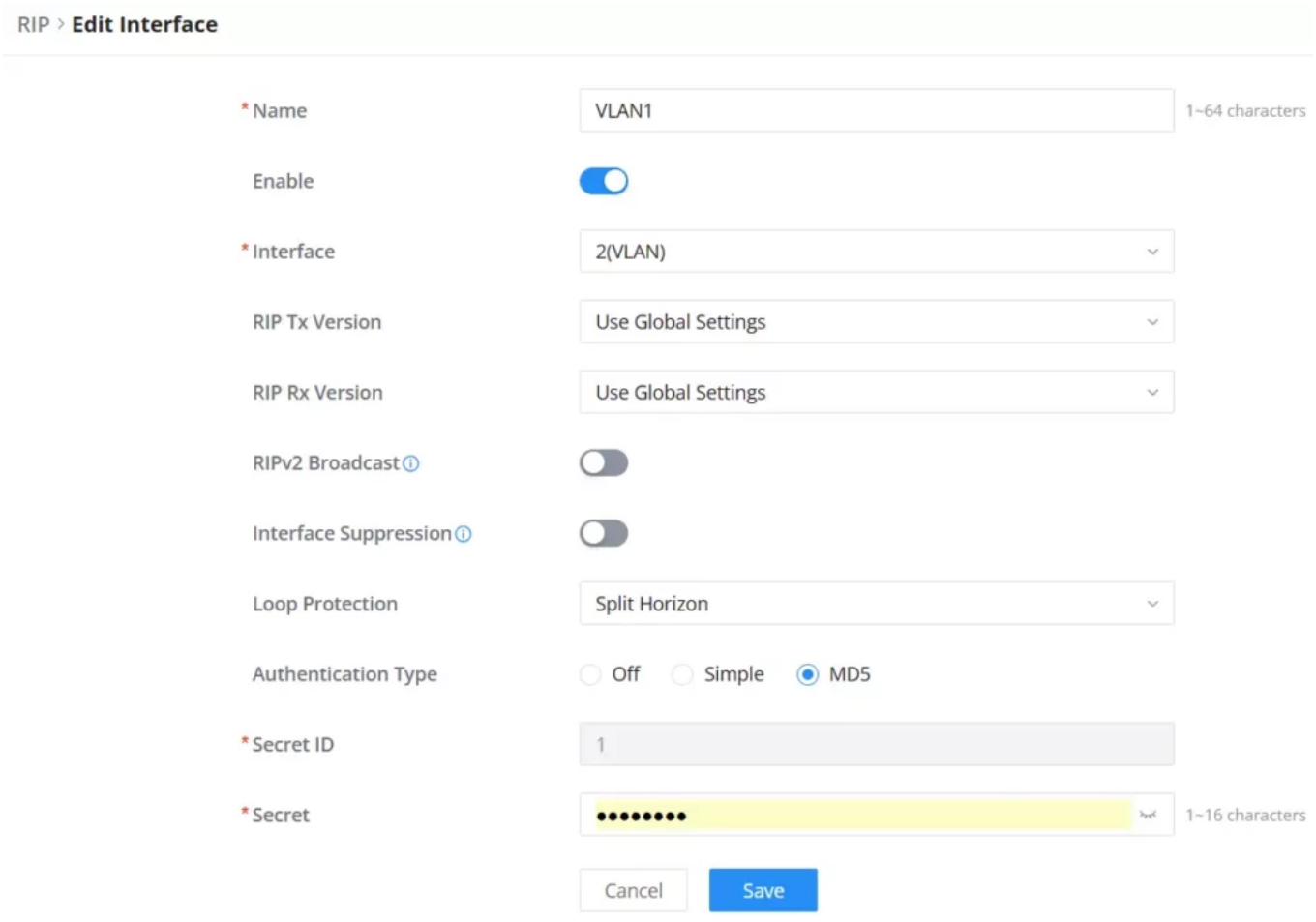
To add an interface, click the **Add** button, or to edit an interface, click the **edit icon**. See the provided images for visual guidance.



RIP Interface Settings

Key Parameters:

- **Interface**: Specifies the interface that RIP will run on (e.g., VLAN, physical interface).
- **RIP Tx Version / RIP Rx Version**: Select the RIP version for transmitting and receiving routes.
- **RIPv2 Broadcast**: Enable/disable broadcasting RIP version 2 messages.
- **Interface Suppression**: Suppresses sending RIP updates on the interface.
- **Loop Protection**: Protects from routing loops using the **Split Horizon** method.
- **Authentication Type**: Choose the type of authentication for RIP (e.g., **MD5**).
- **Secret**: Authentication key (password) for MD5 or simple authentication.



RIP AddEdit interface

RIP - Route Advertisement

The **Route Advertisement** tab in the RIP section allows users to define specific routes that need to be advertised to other routers in the network. This is essential for controlling which sub-networks are shared across the RIP protocol. Proper route advertisement ensures efficient routing and network management by determining what parts of the network can be reached through the RIP-enabled router.

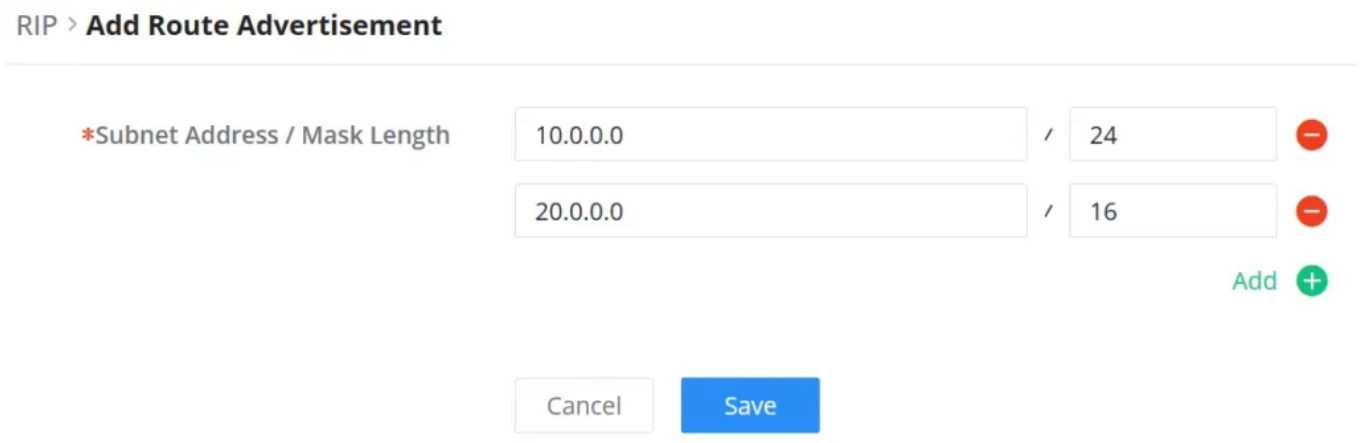
Navigation: To view or modify Route Advertisement settings, navigate to **Routing** -> **RIP -> Route Advertisement**.

RIP Route Advertisement

Key Features in the Route Advertisement Tab:

- **Subnet Address / Mask Length**: Displays the list of subnets being advertised along with their corresponding subnet mask lengths.
- **Add Route Advertisement**: This feature allows users to add one or more subnets to advertise across the network. When adding, users need to provide both the **Subnet Address** and the **Mask Length** (e.g., /24 for Class C networks).
- **Operations**: Each route entry has options to edit or delete the advertisement.

If the user wishes to add a new route advertisement, they can click on the **Add** button and provide the required subnet address and mask length. Once configured, these routes will be shared across the network via RIP.



RIP Add Route Advertisement

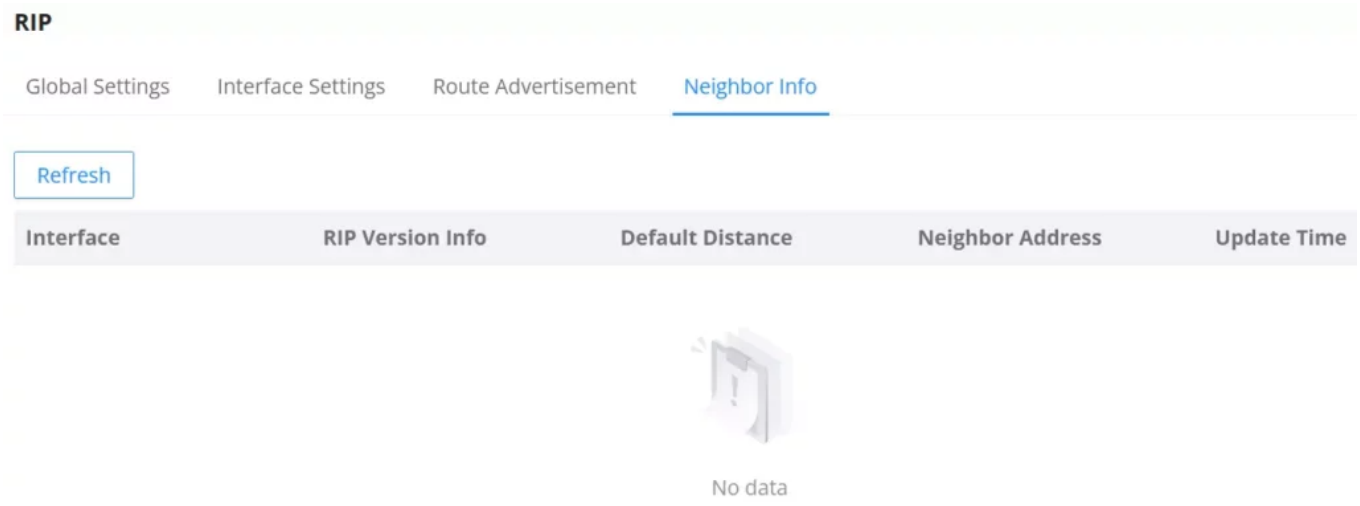
RIP - Neighbor Info

The **Neighbor Info** tab in the RIP configuration provides details about the neighboring RIP routers that communicate with the router to exchange routing information. This tab displays crucial information regarding the neighbors, which helps in managing and troubleshooting RIP routing within the network.

Navigation: To view RIP neighbor details, navigate to **Routing -> RIP -> Neighbor Info**.

Key Information Displayed:

- **Interface**: The network interface that is communicating with the neighbor router.
- **RIP Version Info**: Displays the version of RIP used by the neighbor router.
- **Default Distance**: Indicates the default administrative distance for the neighbor.
- **Neighbor Address**: The IP address of the neighboring RIP router.
- **Update Time**: The last time an update was received from the neighboring router.



RIP Neighbor Info

Border Gateway Protocol (BGP)

The **Border Gateway Protocol (BGP)** is a key exterior gateway routing protocol used to exchange routing information between different autonomous systems (AS) over the internet. BGP plays a critical role in determining the best path for data packets as they travel across various networks. On the Grandstream GCC602x device, BGP is configured under the **Routing** section, offering a powerful solution for network administrators to control traffic between different AS networks.

To configure BGP on Grandstream routers, navigate to **Routing -> BGP**.

BGP - Global Settings

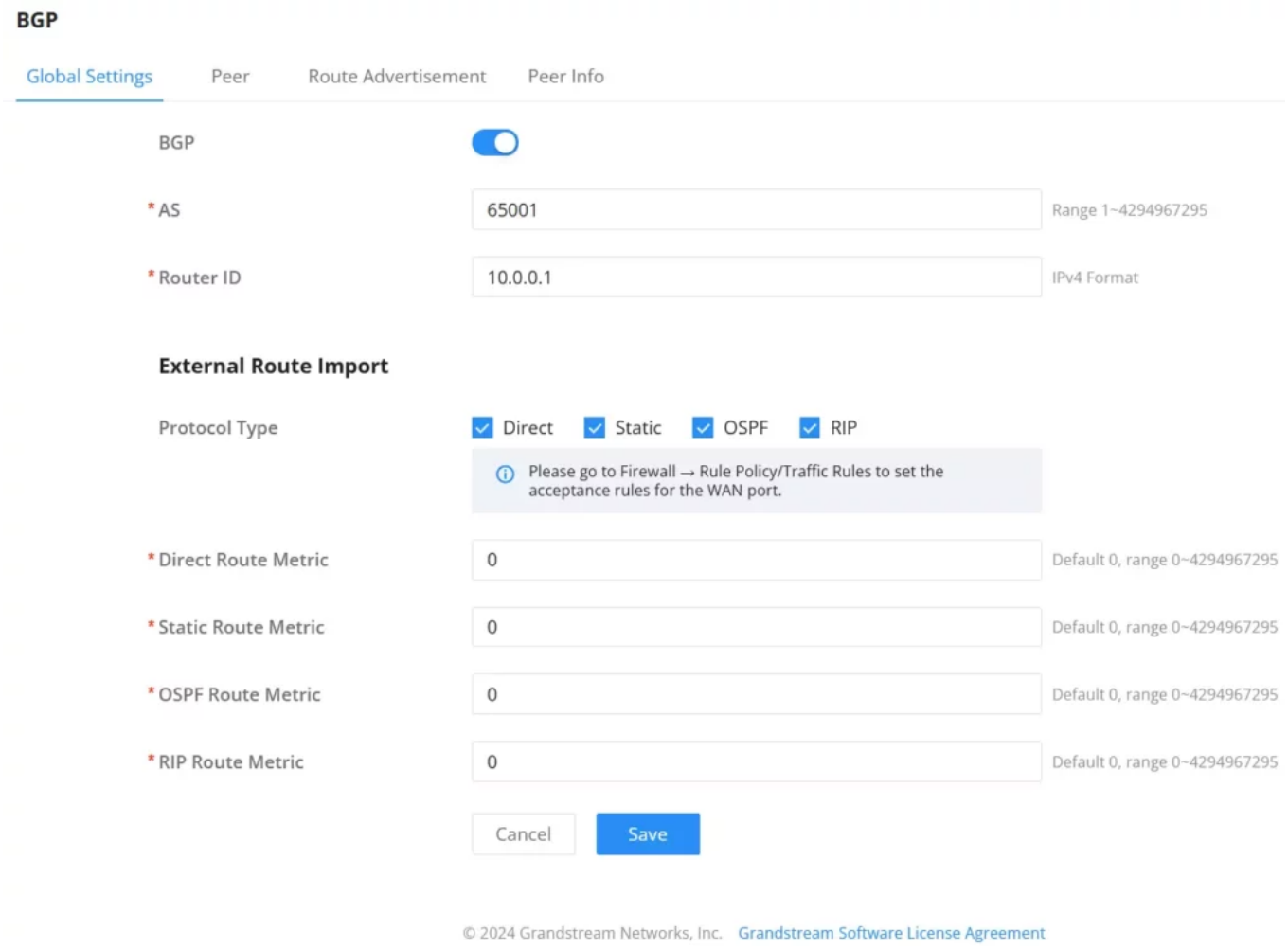
The **Global Settings** tab in BGP configuration allows the user to define the general BGP parameters essential for the protocol's operation.

Key Parameters:

- **AS (Autonomous System)**: The AS number identifies the autonomous system to which the router belongs. It is a required value with a valid range from 1 to 4,294,967,295.
- **Router ID**: A unique identifier in IPv4 format for the router. The router ID is required and helps identify this router in the BGP network.

External Route Import:

- This section allows users to configure which route types (Direct, Static, OSPF, and RIP) can be imported into the BGP routing table.
- **Protocol Type**: You can check the boxes for the route types to import, and set their respective route metrics, which determine the preference for routes. Lower metric values have higher preference.



BGP Global Settings

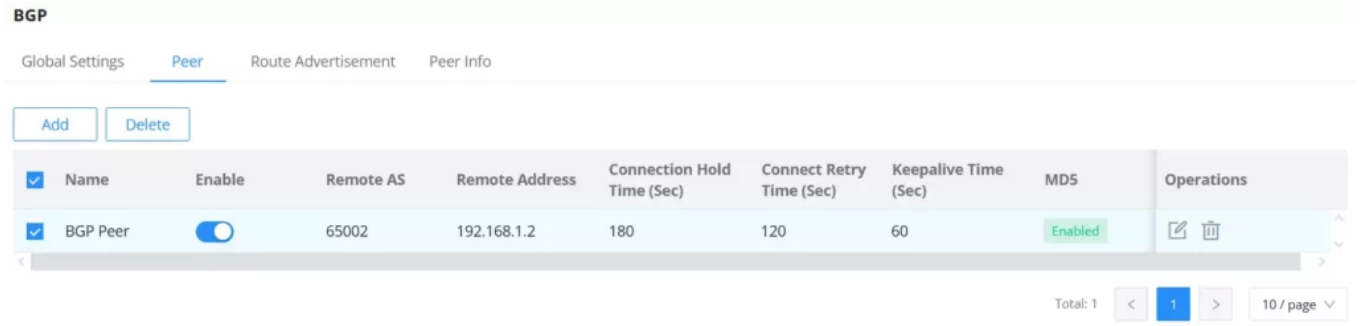
For BGP to function correctly, it is essential to configure the firewall to allow communication on TCP port 179. Go to Firewall -> Rule Policy/Traffic Rules and set rules that permit traffic on this port for the WAN interface. Without this configuration, subnets will be unable to communicate across BGP peers, preventing proper route exchange and connectivity between networks. This step is crucial for establishing a stable BGP connection and enabling subnet communication between autonomous systems.

BGP - Peer

In the BGP (Border Gateway Protocol) Peer tab, users can view, add, or edit BGP peers that are configured on the router. A BGP peer is a neighboring router with which routing information is exchanged. Peers are established through their IP address and ASN (Autonomous System Number).

To add or modify a BGP peer:

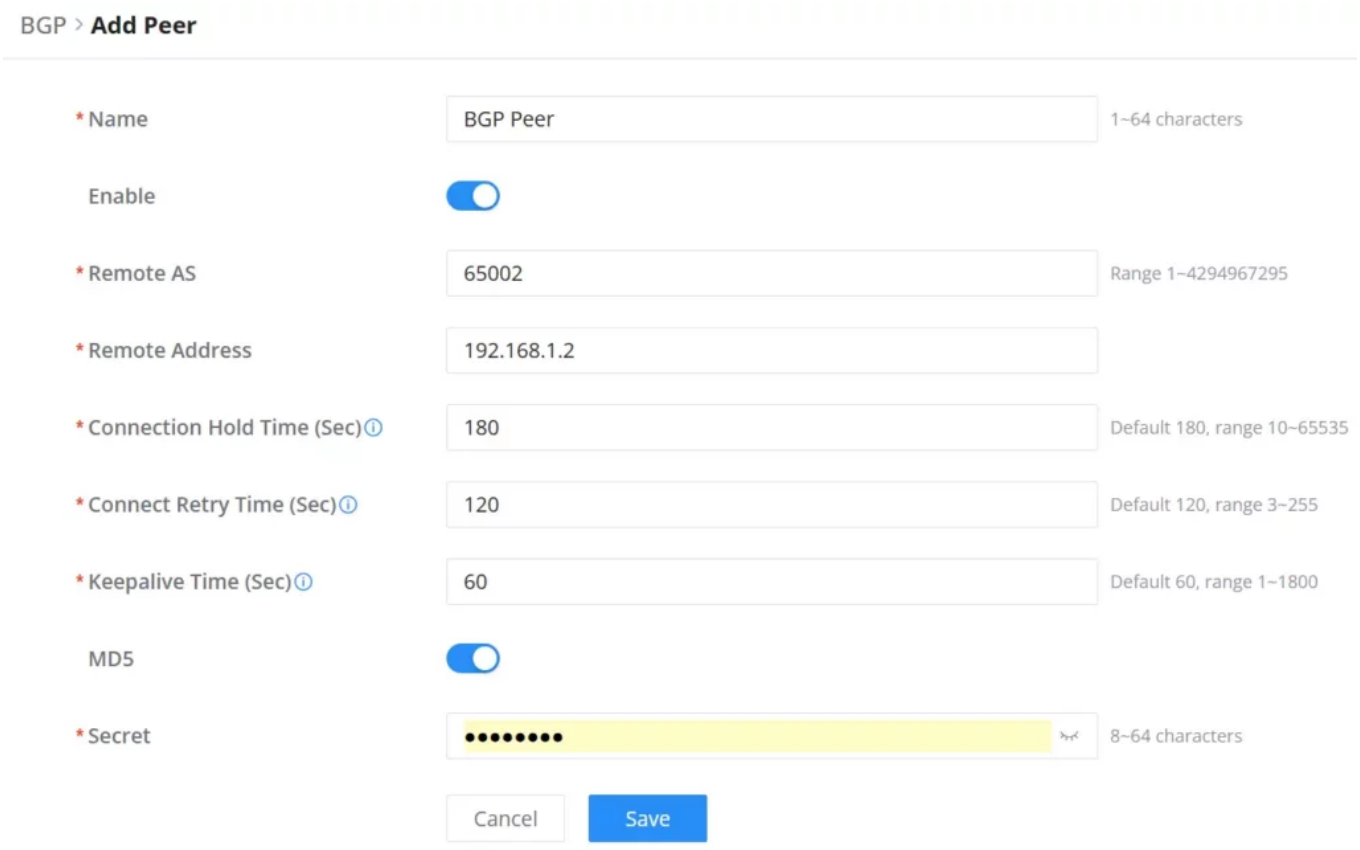
- Click on the **Add** button to create a new peer.
- To modify an existing peer, click the **Edit** icon next to the peer you want to change.



BGP Peer page

Key configurable fields in this tab include:

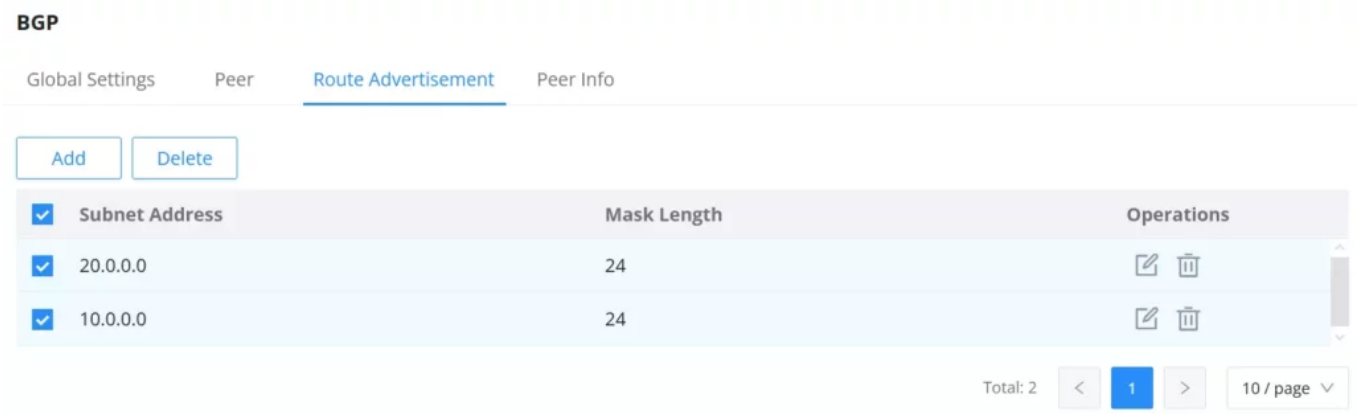
- **Remote AS**: The Autonomous System Number of the remote peer.
- **Remote Address**: The IP address of the remote BGP peer.
- **Connection Hold Time**: The maximum amount of time to hold a BGP connection without receiving a keepalive message.
- **Connect Retry Time**: The interval to retry establishing a BGP connection.
- **Keepalive Time**: The frequency of sending keepalive messages to ensure the peer is active.
- **MD5 Authentication**: Optional security for BGP connections using an MD5 password for session authentication.



BGP AddEdit Peer

BGP - Route Advertisement

The **Route Advertisement** tab allows users to manage BGP-advertised routes by adding or removing specific subnets. Here, you can define which networks are advertised to BGP peers.

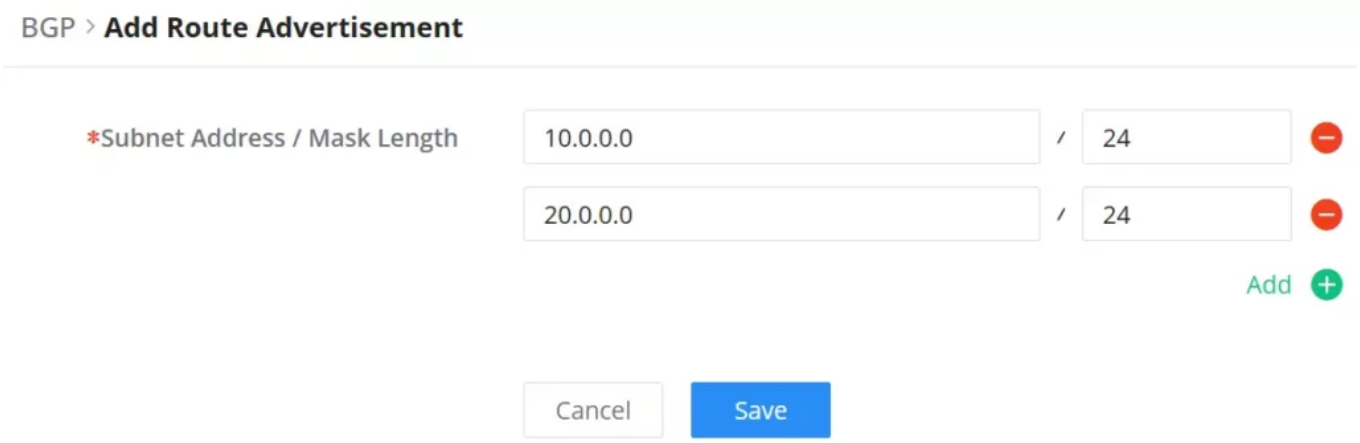


BGP Route Advertisement page

To add or modify an advertised route, click **Add** or the **Edit** icon. The configuration will prompt you to enter the subnet address and mask length, then click **Save**.

Key configurable fields in this tab include:

Subnet Address / Mask Length: Specify the network's IP address and the corresponding subnet mask length (e.g., 10.0.0.0 / 24).



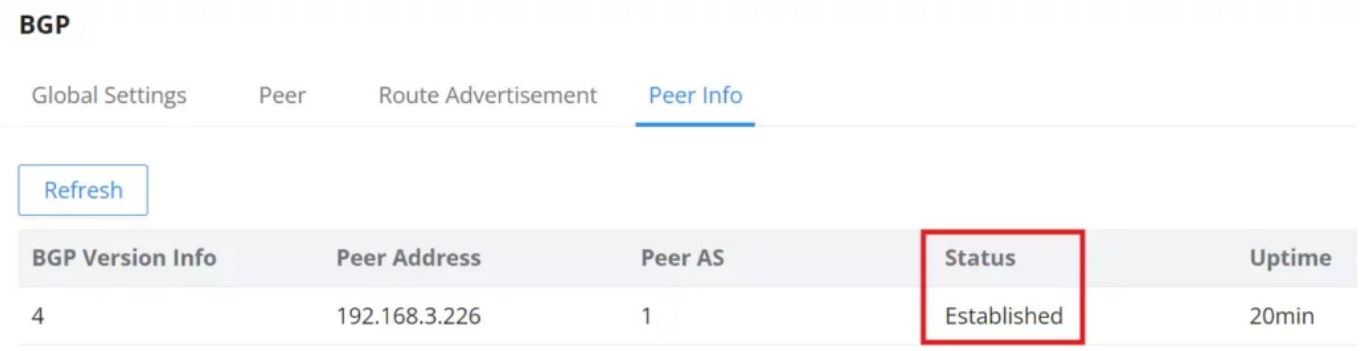
BGP AddEdit route advertisement

BGP - Peer Info

The **Peer Info** tab in the BGP section provides details on the active BGP peers. Here, users can monitor the status and connection of their BGP peers to ensure proper route exchange.

- **BGP Version Info**: Shows the BGP protocol version in use, typically version 4.
- **Peer Address**: Displays the IP address of the BGP peer.
- **Peer AS**: Shows the Autonomous System (AS) number of the peer.
- **Status**:
    - **Established**: Indicates a fully functional BGP connection where routes are being successfully exchanged between peers. This state confirms that the BGP connection is active and stable.
    - **Active**: Shows the BGP connection is active but may not have fully exchanged routes.
- **Uptime**: Tracks how long the peer connection has been established and active.

You can click the **Refresh** button to update the status of the peers. This allows users to quickly verify if their BGP peers are properly connected and whether routes are being exchanged as expected.



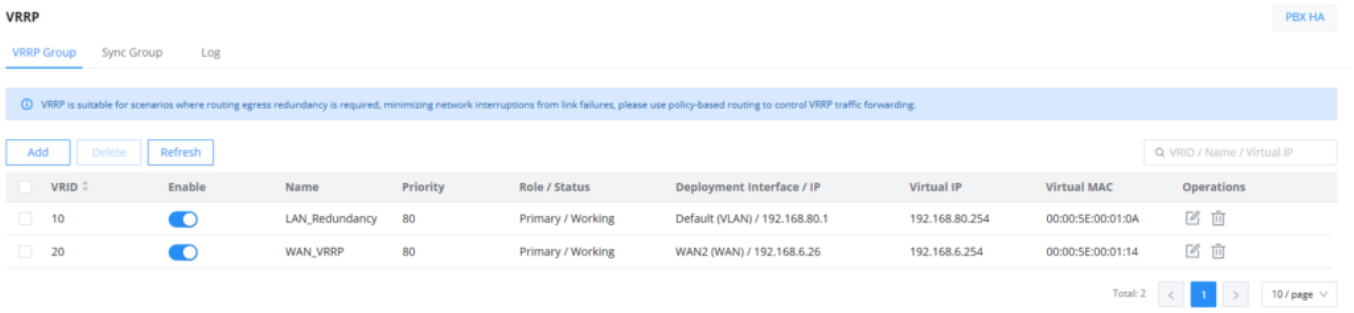
BGP Peer Info

VRRP

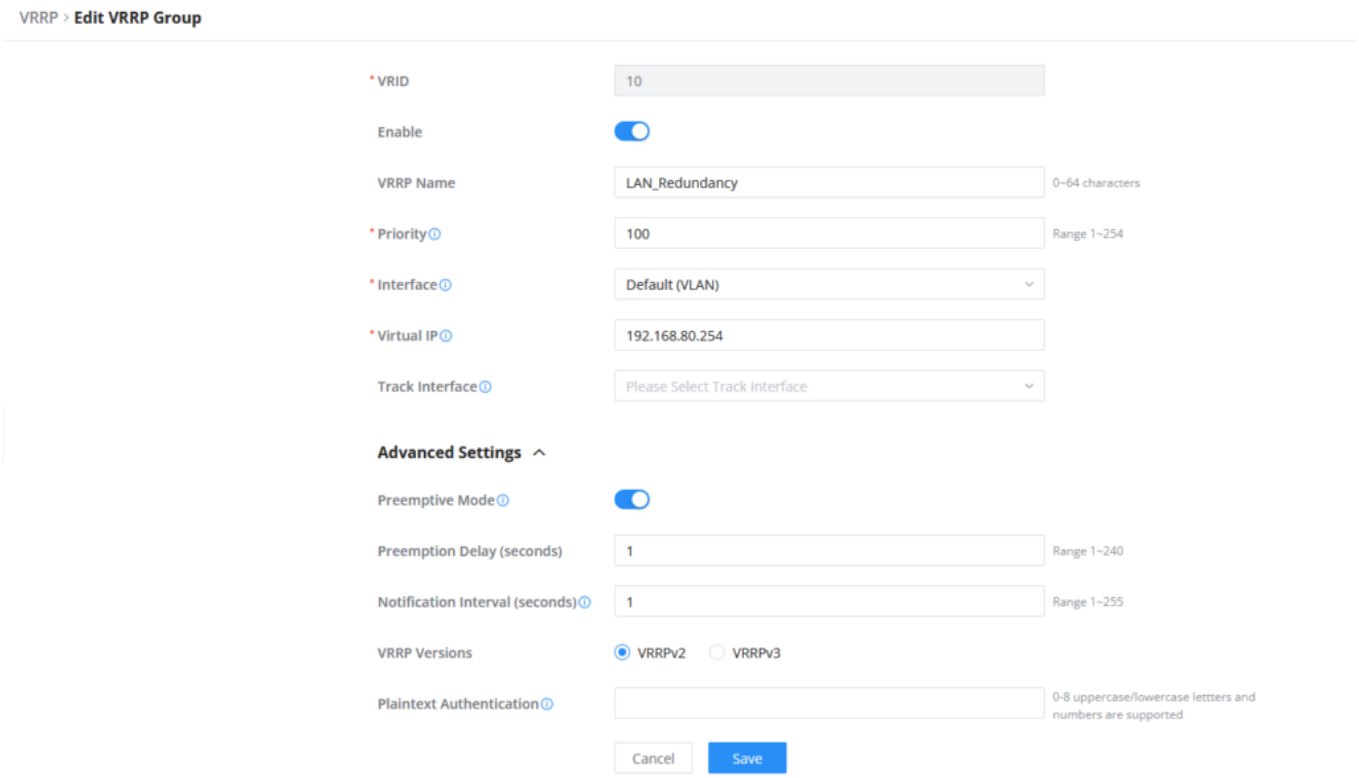
VRRP (Virtual Router Redundancy Protocol) is a feature that lets you set up multiple routers to work together, with the goal of creating a backup plan. It ensures that if one router (the primary or "Master" router) goes down, another router (the "Backup" router) automatically takes over, provided that both routers share the same virtual IP.

VRRP Group

Users can create VRRP groups to represent a collection of routers configured to provide high availability for a virtual IP address. Within a group, the fields defined for each group are as follows:



VRRP Group



VRRP Settings

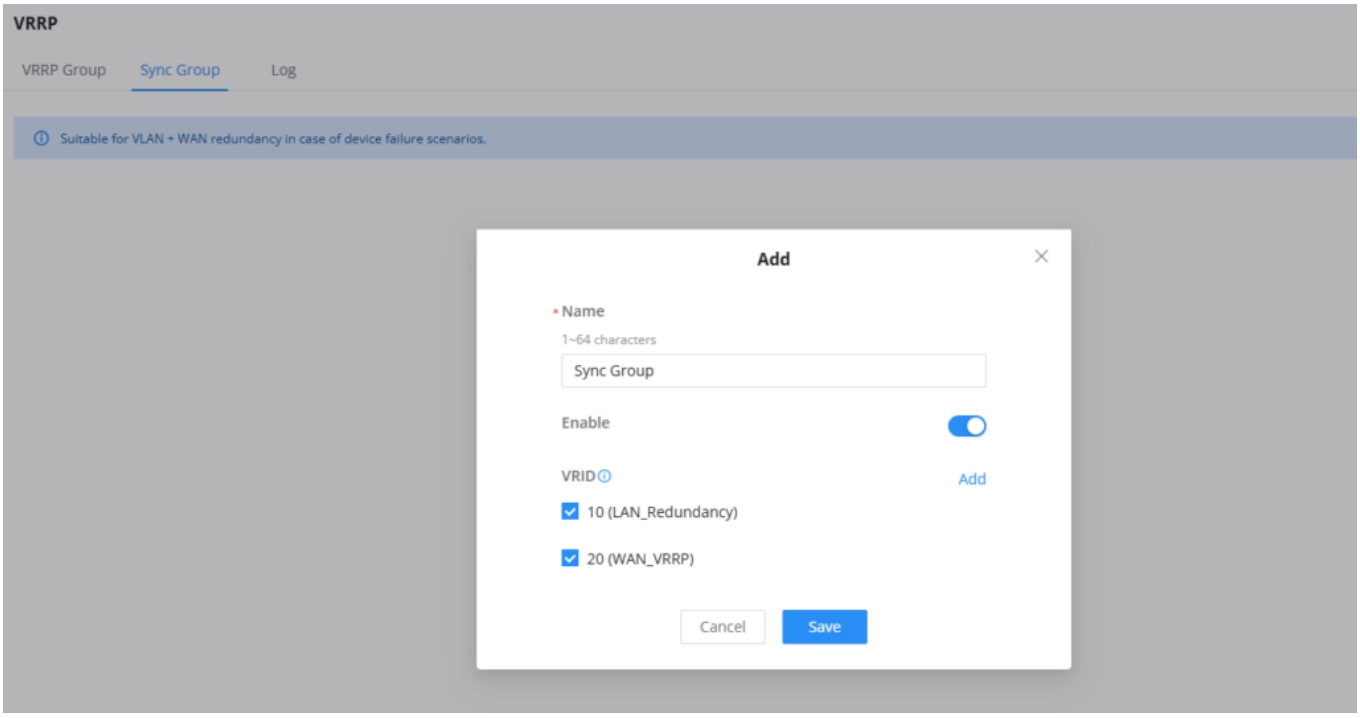
VRID	This is the unique Virtual Router Identifier for the VRRP group, used to distinguish it from other VRRP groups on the same network. Accepts values from 1 to 255.
Enable	Activate or deactivate the VRRP group. When enabled, the VRRP instance starts functioning according to the configuration.
VRRP Name	Defines a descriptive name assigned to the VRRP group for easier identification, supporting up to 64 characters.
Priority	Specifies the priority of this router within the VRRP group. The router with the highest priority becomes the Master. Valid range: 1 to 254, with 255 reserved for the router owning the virtual IP.
Interface	The physical or virtual network interface where the VRRP group operates. This is the interface through which the VRRP group advertises its presence.
Virtual IP	The shared IP address assigned to the VRRP group. This is the IP address clients use to connect to the network service, ensuring high availability.
Track Interface	This is an optional interface that the VRRP group monitors for status changes. If the tracked interface goes down, the VRRP priority of the router decreases to allow a Backup router to take over.
Advanced Settings	
Preemptive Mode	When enabled, allows a higher-priority router to take over the Master role from the current Master after recovering from a failure.
Notification Interval (seconds)	Defines how often (in seconds) VRRP advertisements are sent by the Master router to inform Backup routers of its availability. A shorter interval provides faster failover detection. Range: 1 to 255 seconds.
VRRP Versions	Specifies the VRRP protocol version to use. VRRPv2: Commonly used for IPv4 networks. VRRPv3: Supports both IPv4 and IPv6, with enhanced functionality.
Plaintext Authentication	An optional field to configure a simple plaintext password for authenticating VRRP packets. Supports 0 to 8 alphanumeric characters.

Sync Group

A Sync Group is used to logically group VRRP instances (identified by VRIDs) that require synchronization. This is particularly useful in scenarios involving **device redundancy** or managing failover configurations for **multiple interfaces** (e.g., LAN and WAN).

By grouping and syncing these VRIDs, the router ensures cohesive failover behavior, improving reliability in case of interface or device failure.

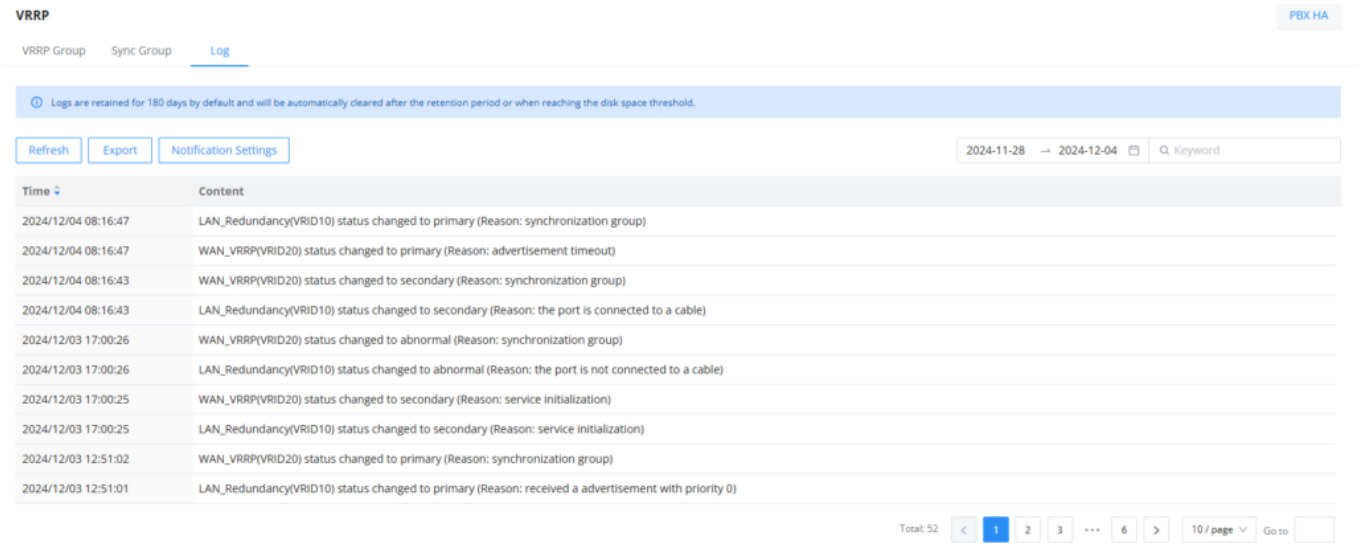
- **Add:** Opens the configuration window to create a new Sync Group. You can define the group name, select VRIDs, and enable or disable the group.
- **Delete:** Deletes a selected Sync Group from the list. This action removes its configuration from the device.
- **Refresh:** Updates the current page to display the latest status or changes in the Sync Group list.



Name	The user-defined identifier for the Sync Group. This name is used to distinguish groups for easier management. It can have between 1 and 64 characters.
Enable	A toggle to activate or deactivate the Sync Group. When enabled, the device starts syncing the VRIDs defined in this group.
VRID	Lists the available VRRP IDs that can be included in the Sync Group. Each VRID corresponds to a VRRP group configured earlier. Example: LAN_Redundancy: A VRID for LAN interface redundancy. WAN_VRRP: A VRID for WAN interface redundancy.

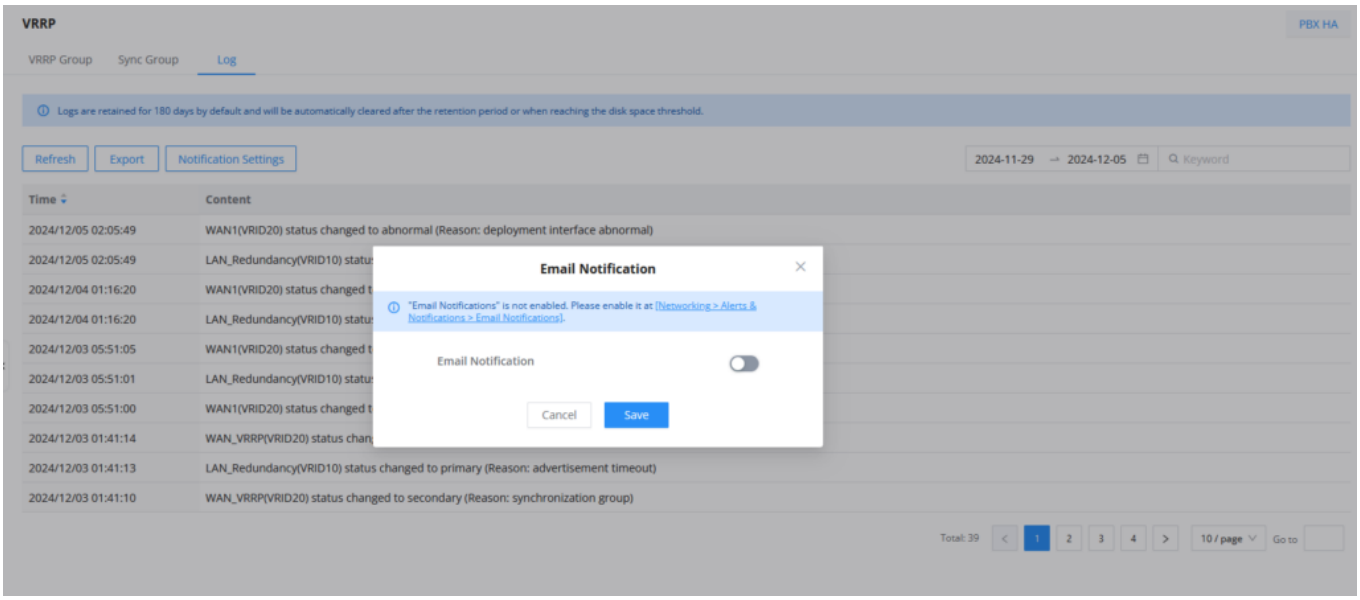
Log

The Log section provides a detailed record of VRRP-related events and operations, such as state transitions (e.g., Master to Backup), priority changes, or synchronization updates. This aids in monitoring the protocol's behavior, diagnosing issues, and ensuring proper failover functionality.



Users can export the logs in a CSV file by clicking the button.

The notifications settings allow users to enable email notifications to be sent to the configured email when an event occurs on the VRRP setup.



For more information on how to set up the VRRP on your GCC device, please refer to the following guide: GCC6000 - VRRP User Guide

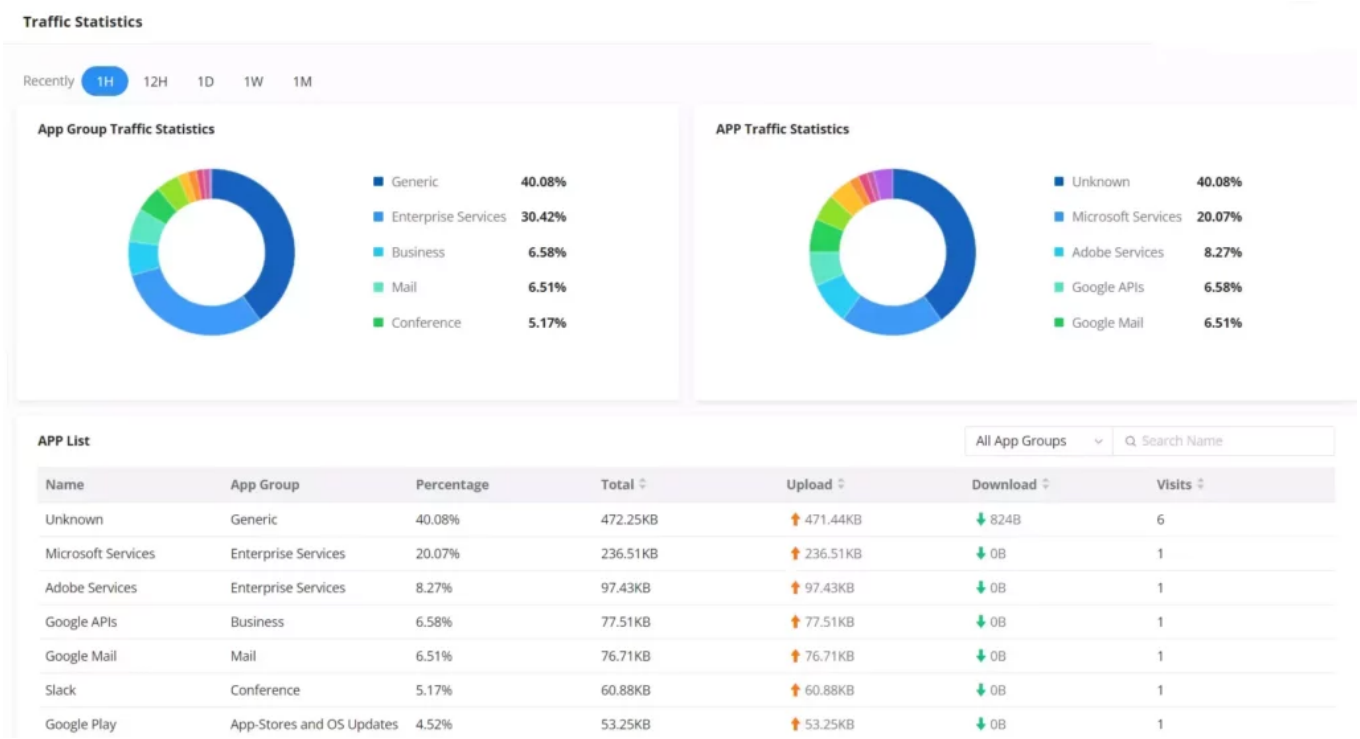
TRAFFIC MANAGEMENT

Traffic Statistics

The **Traffic Statistics** page allows administrators to monitor network traffic based on device identifiers. You can select whether to track traffic by **MAC address** or by **IP address**, depending on your network needs.

When traffic statistics are enabled, the GCC602x will start identifying the traffic and generating statistics. The statistics will be represented graphically as shown in the screenshot below. The feature displays the name and the type of the service generating the traffic to easily identify which services are being used and which clients are using them.

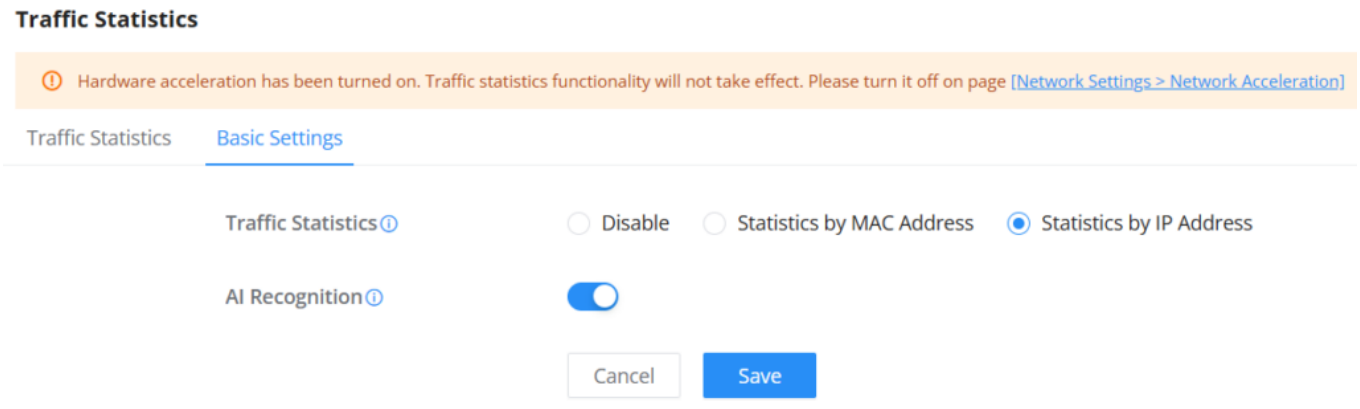
The GCC6020 supports up to a month of traffic statistics data.



Traffic Statistics and Analysis

To enable traffic statistics, navigate to the **Traffic Management -> Traffic Statistics** -> **Basic Settings tab**.

If Hardware Acceleration is enabled, traffic statistics will be disabled. To use this feature, disable hardware acceleration under Network Settings -> Network Acceleration.



Enable Traffic Statistics

Field	Description
Traffic Statistics	Select how traffic data is collected: * Disable * Statistics by MAC Address - Recommended for LAN device management and security control. * Statistics by IP Address - Recommended for WAN-level traffic analysis.
AI Recognition	Enable AI deep learning to improve application classification accuracy. May increase CPU and memory usage.

Note	Traffic statistics are inactive if Hardware Acceleration is turned on.

QoS

Quality of Service (QoS) is a feature that allows the prioritization of the latency-sensitive traffic exchanged between the WAN and the LAN hosts. This will offer more control over the usage of a limited bandwidth and ensure that all application services are not affected by the amount of traffic exchanged.

General Settings

On this page, the user will be able to allocate a percentage of the download and the upload bandwidth to 4 classes. These classes can be assigned to applications to determine which application traffic will be prioritized, including the inbound and the outbound traffic. Also, it's possible to tag outbound traffic with DSCP tags for each class.

QoS - General Settings

To set the upload/download bandwidth percentage for each class, click on the edit button .

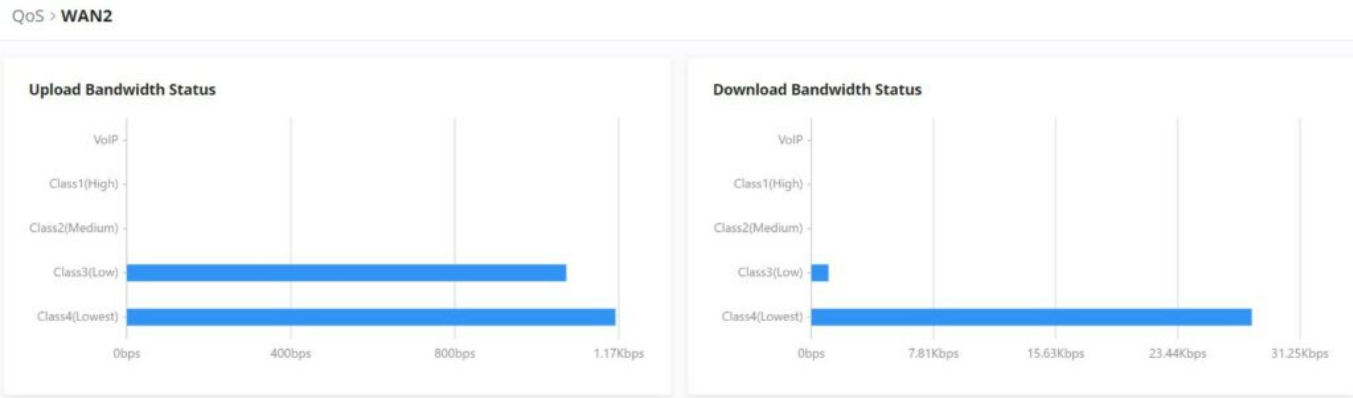
If the bandwidth value is incorrect, QoS might not work properly. Before enabling QoS, please check the upload and bandwidth rates of your connection, or contact your ISP to obtain the exact upload and download values. The total sum of the bandwidth percentages cannot exceed 100%.

WAN Port QoS Settings

Upload/Download Bandwidth	
Status	Toggle QoS for the WAN port on/off
Maximum Upload/Download Bandwidth	Specify the maximum upload/download speed for the WAN port. The supported range is 1-2560 Mbps.
Class1 (High)	Specify the bandwidth percentage allocated for Class 1.
Class2 (Medium)	Specify the bandwidth percentage allocated for Class 2.
Class3 (Low)	Specify the bandwidth percentage allocated for Class 3.
Class4 (Lowest)	Specify the bandwidth percentage allocated for Class 4.

Edit Bandwidth limit

Click on the bandwidth statistics icon to get a general overview of the upload/download bandwidth status.



QoS UploadDownload Bandwidth Status

APP QoS

GCC6020 can prioritize the traffic of applications by category or individually. The priority level can be set in 4 classes, class 1 having the highest priority and class 4 having the lowest priority. To access APP Class

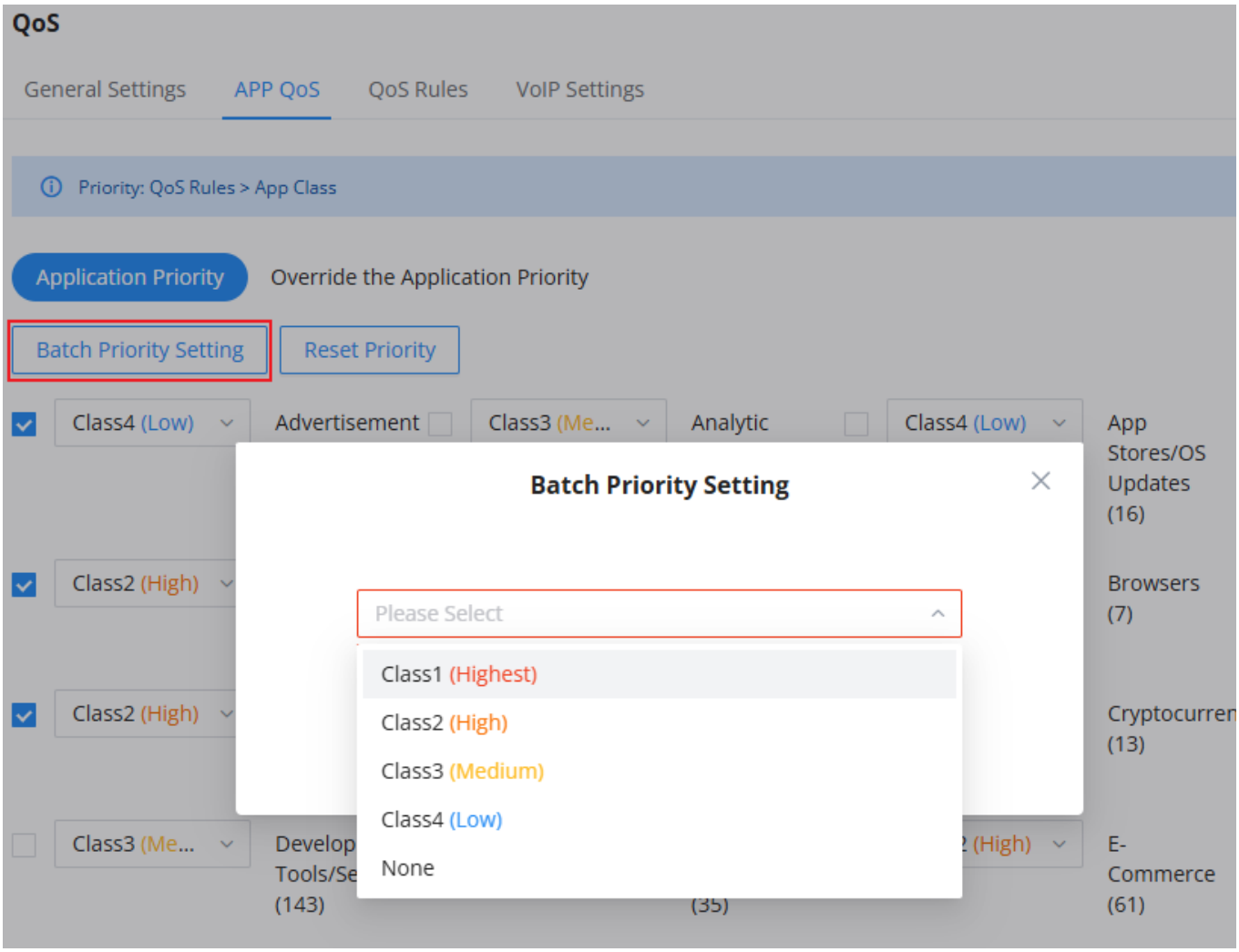
settings, please access the web GUI of the router, then navigate to **Traffic Management -> QoS -> APP Class.**

- **Application Priority**

Under **Application Priority**, users can select a category, then specify the priority (Highest, High, Medium, Low, or None). Please check the figure below:

QoS - APP Class

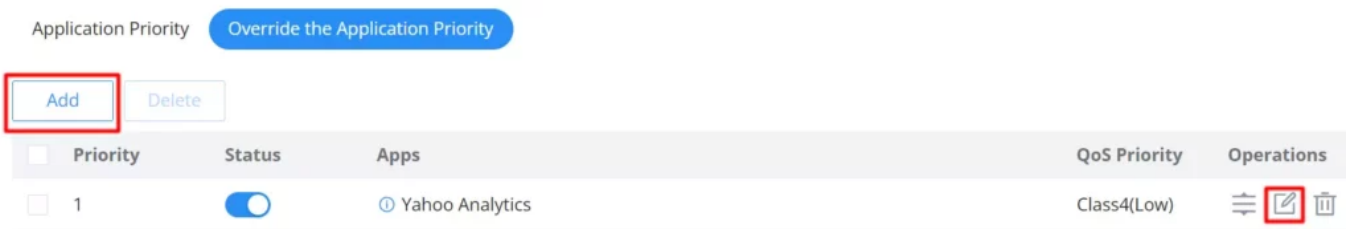
It's also possible to select many categories and then click on "**Batch Settings**" to apply QoS Priority on all of them at once.



QoS - Apps Class - Configure Classes

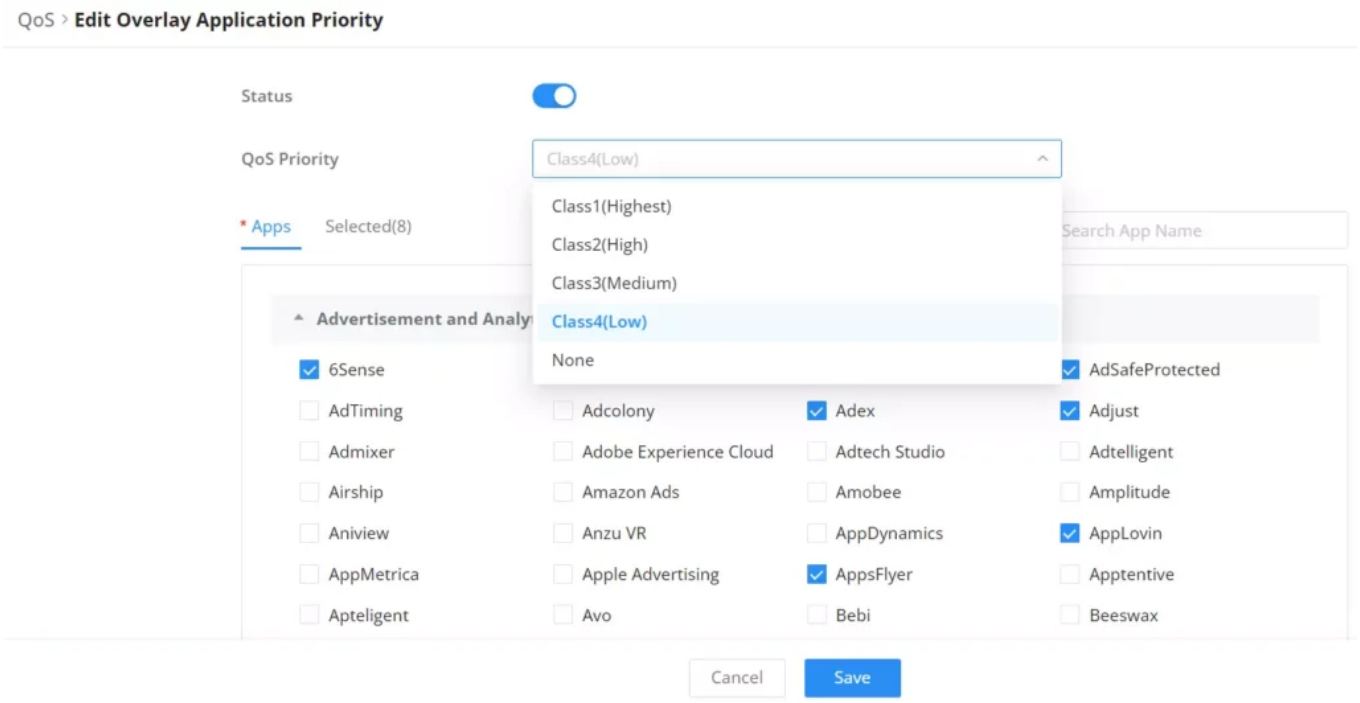
- **Override the Application Priority**

The previous option (Application Priority) applies the priority to the whole category. If the users want to make an exception or add a specific application, under "**Override the Application Priority**", click on the "**Add**" button as shown below:



QoS Apps Class Override the Application Priority

Then, select the specific applications even from different categories, and after that, select the QoS priority from the drop-down list. This will override the Application Priority applied to the whole category.

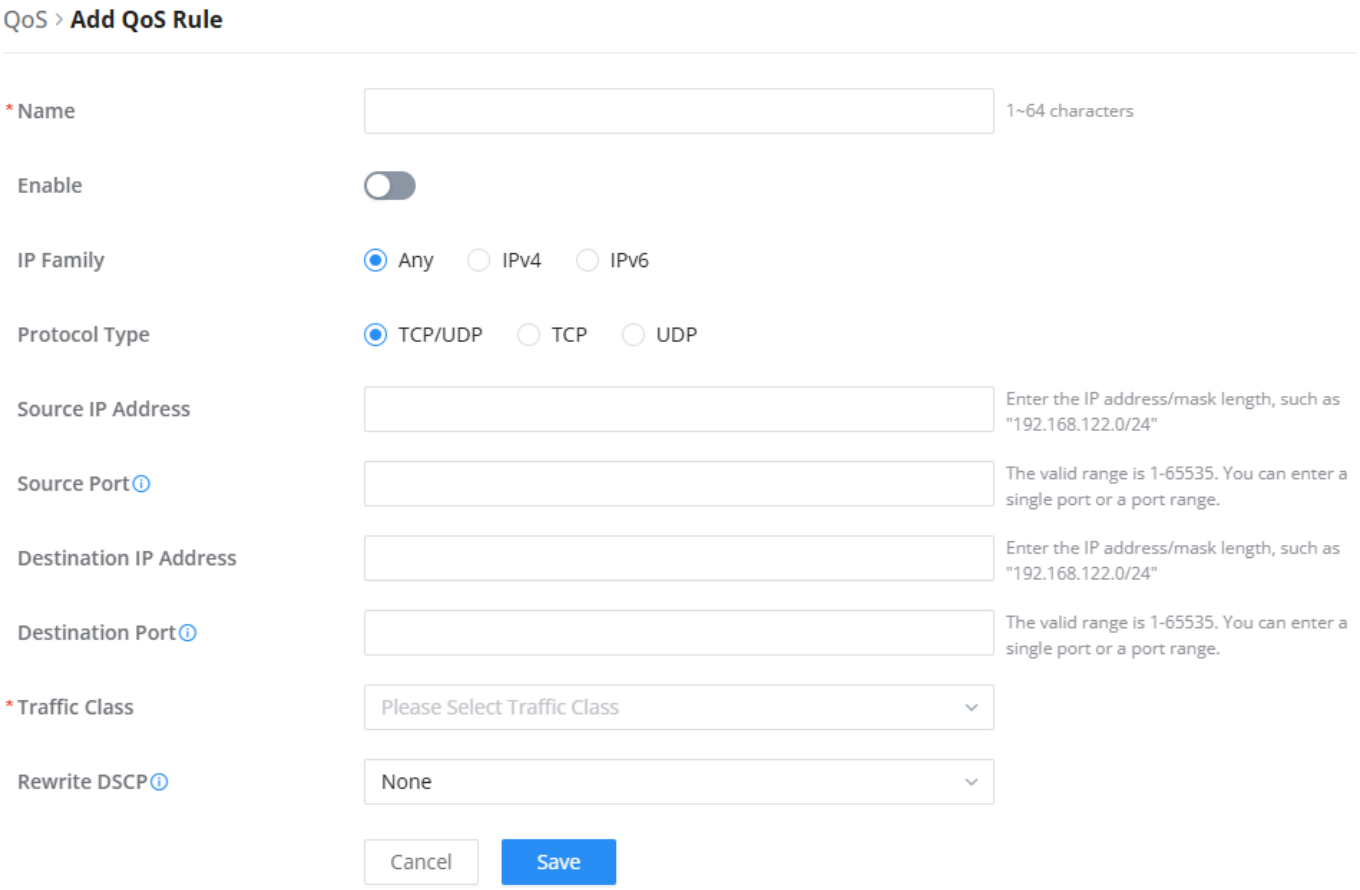


QoS Apps Class AddEdit Override the Application Priority

App Class may take some time to be applied since the router needs to inspect a sufficient number of packets to identify the traffic generated by the application.

Class Rules

QoS class rules are rules that set the QoS based on source and/or destination IP addresses, and source and destination ports.



QoS - Add Class Rules

Name	Enter the name of the class. The character limit is 1-94 characters.
Status	Enable or disable the class's status.
IP Family	Choose the IP family: Any: The IP addresses allowed can either be IPv4 or IPv6. IPv4: The IP addresses allowed are strictly IPv4. IPv6: The IP addresses allowed are strictly IPv6.
Protocol Type	Choose the protocol type: TCP/UDP: The QoS class will apply to both TCP and UDP traffic. TCP: The QoS class will apply only to the TCP traffic. UDP: The QoS class will apply only to the UDP traffic.
Source IP Address	Enter the source IP address/mask length. E.g.,"192.168.122.0/24??
Source Port	Enter a single port number, multiple port numbers, or a range of ports number. Example:- To enter a single port number, type the port such as "3074". - To enter multiple port numbers, type the port numbers with a comma in between each port number, such as "3074, 5060, 10000". - To enter a range of port, enter the first port number in the range, then type a dash (-) and enter the last port number in the range. E.g., "10000-20000" Note: The valid range of port numbers that can be entered is 1-65535. number
Destination IP Address	Enter the destination IP address/mask length. E.g.,"192.168.122.0/24??
Destination Port	Enter a single port number, multiple port numbers, or a range of ports number.Example:- To enter a single port number, type the port number such as "3074".- To enter multiple port numbers, type the port numbers with a comma in between each port number, such as "3074, 5060, 10000".- To enter a range of port, enter the first port number in the range, then type a dash (-) and enter the last port number in the range. E.g., "10000-20000"Note: The valid range of port numbers that can be entered is 1-65535.
Traffic Class	Assigns a priority class (e.g., Class1 (Highest), Class2, Class3, Class4) to determine traffic handling.

Rewrite DSCP	The DSCP for the current priority overrides the DSCP of the corresponding priority in the outbound traffic marking, and takes precedence.

QoS - Add Class Rules

VoIP Settings

The **VoIP Prioritization** feature on the GCC6020 enhances the quality of voice communication by prioritizing VoIP traffic such as SIP and PBX. These settings ensure that voice data takes precedence over other network traffic, improving the reliability and quality of phone calls.

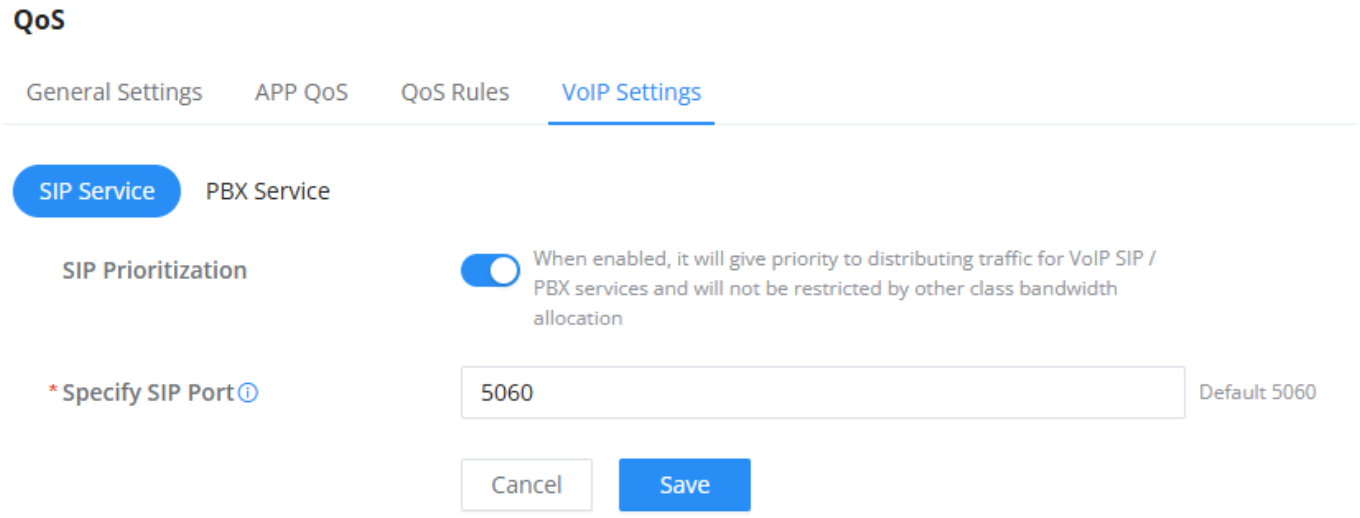
To configure these settings, navigate to **Traffic Management** -> **QoS** -> **VoIP Settings** in the Web UI.

QoS does not take effect if Hardware Acceleration is enabled. Disable this feature in **Network Settings -> Network Acceleration** before proceeding.

- **SIP Service Configuration**

1. Go to **Traffic Management** -> **QoS** -> **VoIP Settings**.
2. Select the **SIP Service** tab.
3. Toggle **SIP Prioritization** to enable prioritization for SIP traffic.
4. Enter the **SIP UDP Port** (default is **5060**).

By enabling this setting, VoIP SIP traffic is given priority over other types of data traffic, ensuring better voice communication quality.

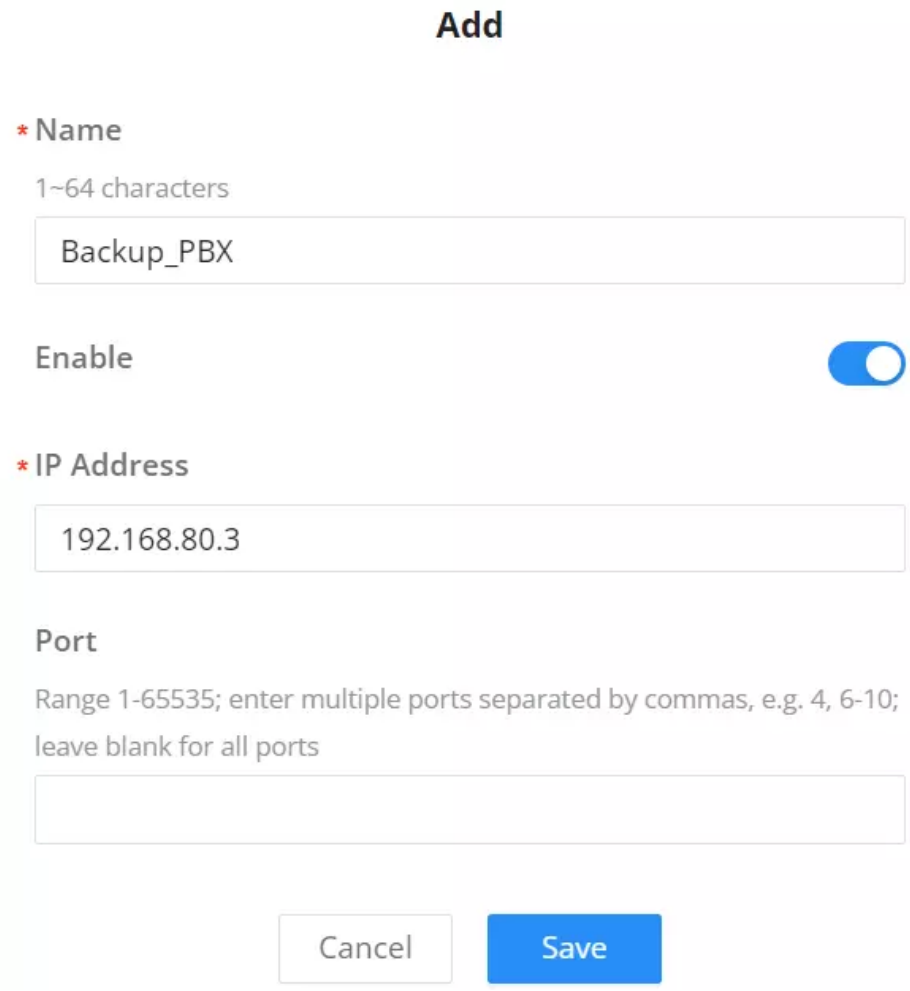


VoIP Settings SIP Service

- **PBX Service Configuration**

1. Go to **Traffic Management** -> **QoS** -> **VoIP Settings**.
2. Select the **PBX Service** tab.
3. Click **Add** to configure a new PBX service.
4. Fill in the necessary fields (explained in the table below).
5. After adding, enable the PBX service to prioritize traffic for this specific server.

VoIP Settings PBX Service



VoIP Settings PBX Service Add

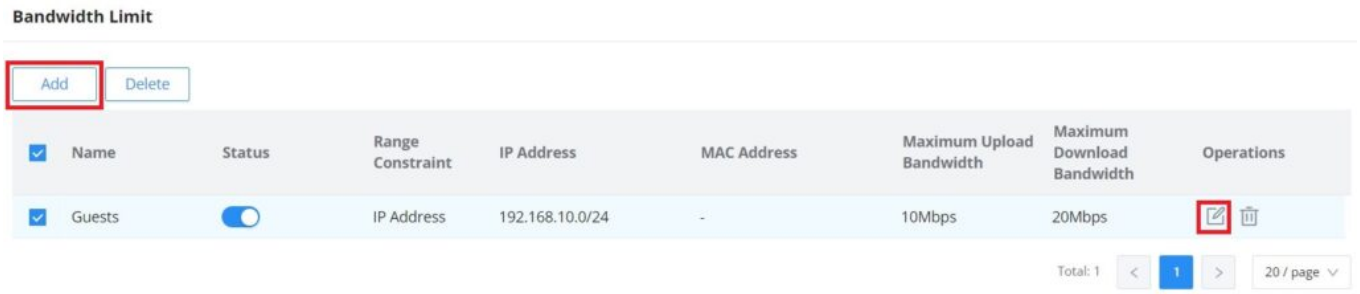
Field	Description
Name	Descriptive name for the PBX server (e.g., Local PBX or Backup PBX).
IP Address	The IP address of the PBX server that will handle the VoIP traffic.
Port	Range 1-65535; enter multiple ports separated by commas, e.g., 4, 6-10; leave blank for all ports.

VoIP Settings - PBX Service - Add

Once configured, PBX traffic is prioritized, ensuring consistent quality for calls routed through the designated PBX servers.

Bandwidth Limit

The Bandwidth Limit feature helps to limit bandwidth by specifying the maximum upload and download limit; then this limit can be applied to each IP/MAC address or applied to all IP addresses in the IP address range. Navigate to **Web UI -> Traffic Management -> Bandwidth Limit**.



Bandwidth Limit page

To add a bandwidth rule, please click on the "Add" button or click on the "**Edit**" icon as shown above.

Please refer to the figure below:

Add or Edit Bandwidth Rule

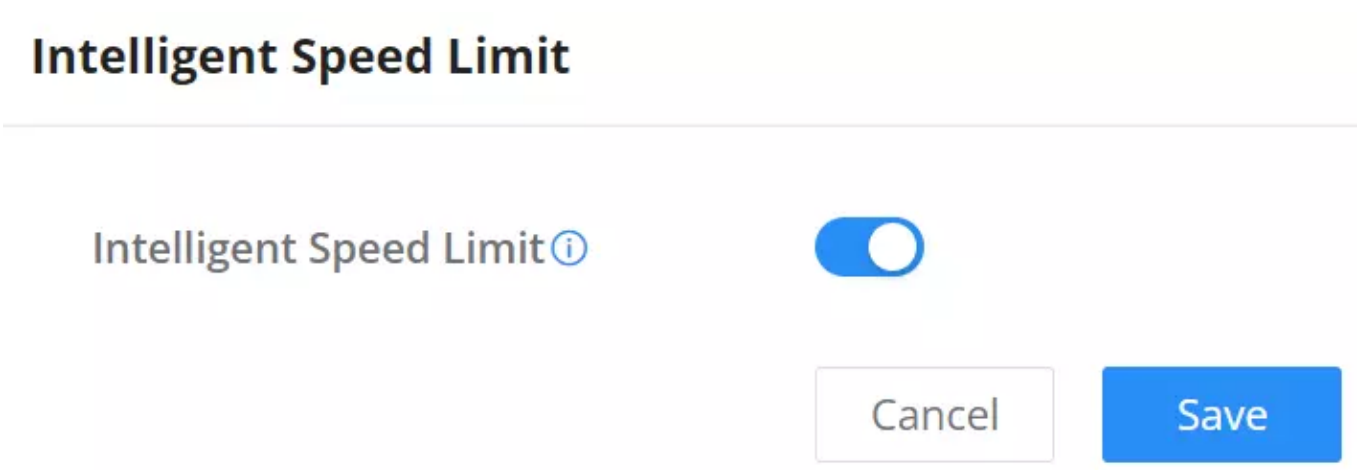
Name	Enter a name for this rule. (1-64 characters)
Enable	Enable/disable the rule
Constraint Range	Select the constraint range:IP AddressMAC AddressDefault is "IP Address"
MAC Address	Specify the MAC address when the "Constraint Range" is set to "MAC Address"
Application Mode	Individual: Set the maximum upload bandwidth and maximum download bandwidth that can be used by each IP address/IP address segment.Shared: Set the sum of the maximum upload bandwidth and maximum download bandwidth that can be used by all IP addresses in the IP address range.Note: It applies to "Constraint Range = IP Address" only
IP Address/Mask Length	Set the IP Address(es) and thier maskes.Note: It applies to "Constraint Range = IP Address" only
Maximum Upload Bandwidth	Set the Maximum Upload Bandwidth.The range is 1~10240, if it is empty, there is no limit
Maximum Download Bandwidth	Set the Maximum Download Bandwidth.The range is 1~10240, if it is empty, there is no limit
Bandwidth Schedule	Enabled or disable Bandwidth schedule.
Schedule	Select or add a schedule to apply.

Application Mode: Select "Individual" to set the maximum upload bandwidth and maximum download bandwidth that can be used by each IP address, and "shared" to set the sum of the maximum upload bandwidth and maximum download bandwidth that can be used by all IP addresses in the IP address range.

Intelligent Speed Limit

When intelligent speed limit is enabled, it automatically limits the speed of download or upload traffic when the CPU load is high.

To enable Intelligent Speed Limit, navigate to **Traffic Management -> Intelligent Speed Limi**t, then toggle ON the feature.

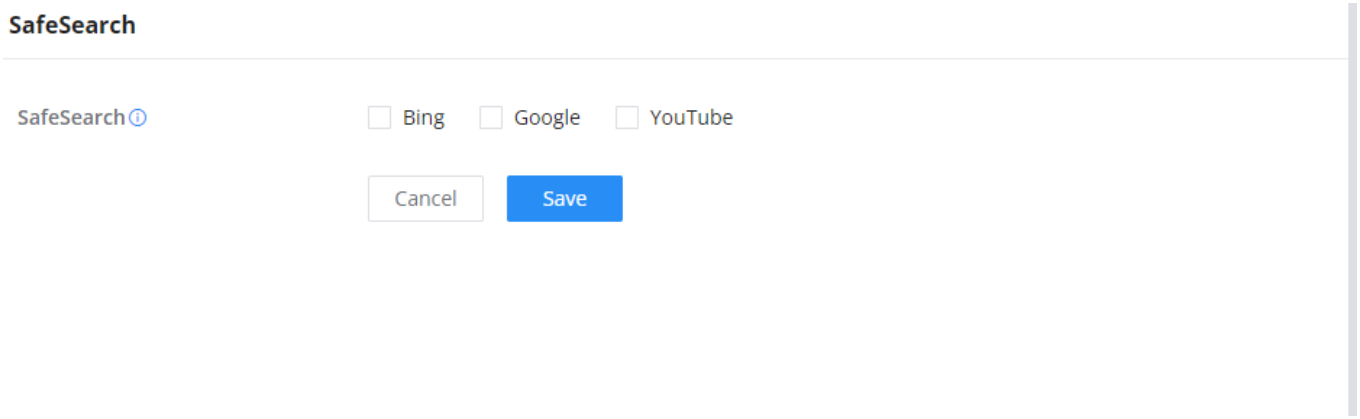


Intelligent Speed Limit

ACCESS CONTROL

SafeSearch

The GCC6020 offers a SafeSearch feature on Bing, Google, and YouTube.Enabling this option will hide any inappropriate or explicit search results from being displayed.



Site Control page

EXTERNAL ACCESS

By default, all the requests initiated from the WAN side are rejected by the GCC6020 external access features, which allow hosts located on the WAN side to access the services hosted on the LAN side of the GCC602x.

DDNS

Dynamic Domain Name System (DDNS) allows users to map a dynamic IP address to a fixed domain name, making it easier to access devices on networks where the IP address may change. This is especially useful for remote access to networked devices without requiring a static IP.

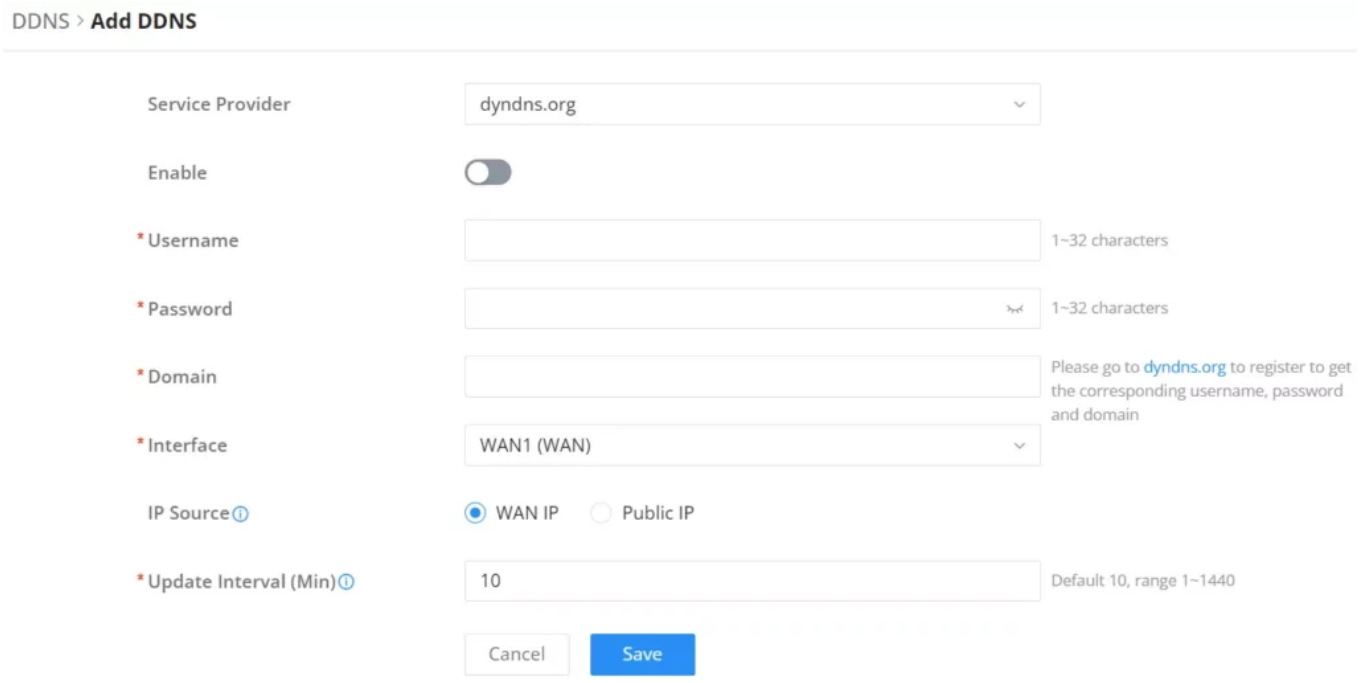
GCC6020 devices support DDNS configuration, enabling seamless remote access through a consistent domain name, regardless of IP changes. Key features include:

- **Multiple Provider Support**: Choose from popular DDNS providers to match your existing account.
- **Public IP Detection**: When positioned behind a NAT,the GCC6020 devices can detect and register the

public IP address for accurate DDNS updates.

- **Customizable Update Intervals**: Set the frequency of updates to ensure the DDNS server always has the current IP address.
- **Interface Selection**: Specify the WAN interface used for DDNS, allowing flexibility in multi-WAN environments.

These features make the GCC6020 devices ideal for environments requiring reliable remote access, even in networks with dynamic IP addresses.



DDNS Page

Field	Description
Service Provider	Dropdown selection of available Dynamic DNS providers (e.g., dyndns.org, changeip.com, etc.).Note: Requires registration at the chosen provider's website to obtain the domain, username, and password for DDNS services. Custom option allowing you to manually configure any third-party DDNS service by providing the update URL and parameters.
Service Provider Name	Set the Service Provider Name. (1-64 characters)Note: This field appears only when "Service provider" is sset to "Custom".
Service Provider URL	Fill in the URL format according to the service provider's URL format specifications and ensure that the URL contains http:// or https:// protocol type and the <domain>, <ip>, <username>, and <password> placeholders.Example:https://ddns.example.com/update?hostname=<domain>&myip=<ip>&username=<username>&password=<password>Note: This field appears only when "Service provider" is sset to "Custom".
Enable	Toggle to enable or disable the DDNS service for the selected provider.
Username	Enter the username provided by the DDNS service provider. Range: 1-32 characters.
Password	Enter the password associated with the DDNS service provider.Range: 1-32 characters.
Domain	Enter the domain or hostname to be updated by the DDNS service.
Interface	Select the WAN interface to associate with the DDNS update.
IP Source	Choose between 'WAN IP' or 'Public IP' for the source of IP to send to the DDNS provider.Default: WAN IP.Note: Use 'Public IP' if behind a NAT to detect and use the device's public IP address for the DDNS update

Update Interval (Min)	Set the interval in minutes for updating the IP address of the device to the DDNS server.Default: 10.Range: 1-1440.Note: Increasing interval reduces frequency of updates to the DDNS server

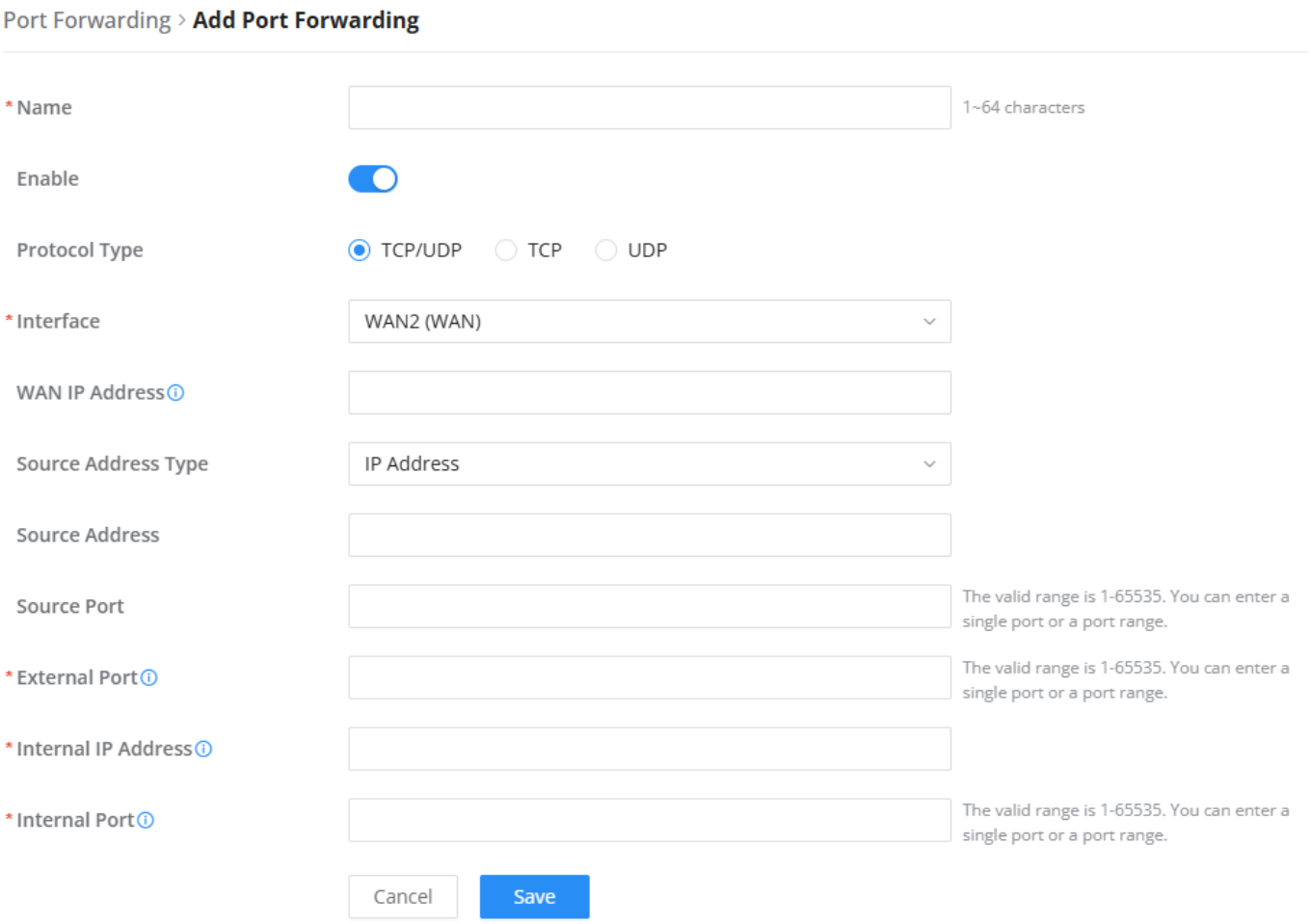
DDNS Page

Port Forwarding

Port forwarding allows forwarding requests initiated from the WAN side of the GCC6020 to a LAN host. This is done by configuring either the port only or the port and the IP address in case we want to restrict access over that specific port to one IP address. Once the GCC6020 receives the request on the IP address, the GCC6020 will verify the port on which the request has been initiated and will forward the request to the host IP address and the port of the host which is configured as the destination.

Port forwarding can be used in the case when a host on the WAN side wants to access a server on the LAN side.

Navigate to **External Access -> Port Forward**:



Port Forwarding page

Refer to the following table for the Port Forwarding option when editing or creating a port forwarding rule:

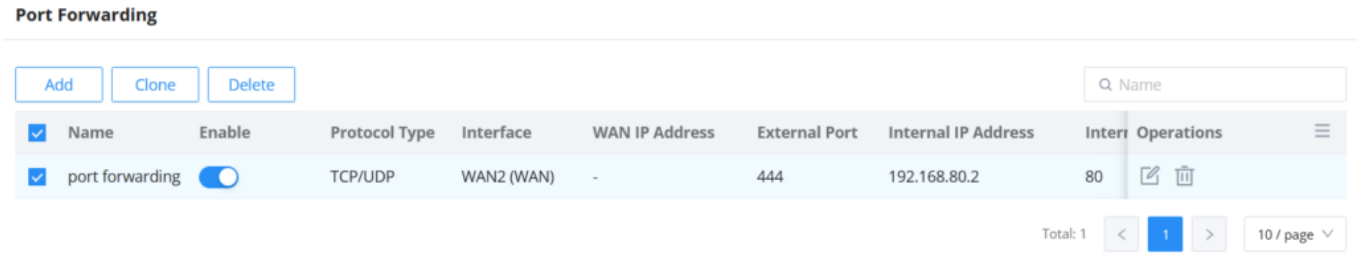
Name	Enter a name for the port forwarding rule.
Status	Toggle on/off the rule status.
Protocol Type	Select the transport protocol used.TCP/UDPTCPUDP
Interface	Select the WAN port

WAN IP Address	Enter the WAN IP address for Internet clients to access this server; if an interface is selected, leave this field blank and all IP addresses on that interface can be used for port forwarding.
Source Address Type	Select the address type that will be enteredIP AddressIP SubnetSelect IPv4 AddressSelect IPv4 Address Group
Source Address	Sets the IP address that external users access to this device. If not set, any IP address on the corresponding WAN port can be used
Source Port	Set a single or a range of Ports.
External Port	The service port that the router provides to the WAN. External users obtain services by sending requests to this port. You can enter a port number or a range of ports (e.g. 5-23).
Internal IP Address	Set the The IP address of the network host acting as the server in the LAN IP address.
Internal Port	The service port provided by the router to the local network, i.e. the LAN service port. If the source port is entered in a range, the destination port must also be entered in a range, and the port range difference must be consistent (for example, the source port can be entered as 10-20, and the destination port can be entered as 11-21, and the port range difference is 10).

Port Forwarding page

The **Port Forwarding** page includes a **Clone** button, allowing administrators to quickly duplicate existing port forwarding rules. This simplifies the creation of similar rules without manual re-entry.

To clone a rule, select the desired entry and click **Clone**. The duplicated rule can then be edited if needed before saving.

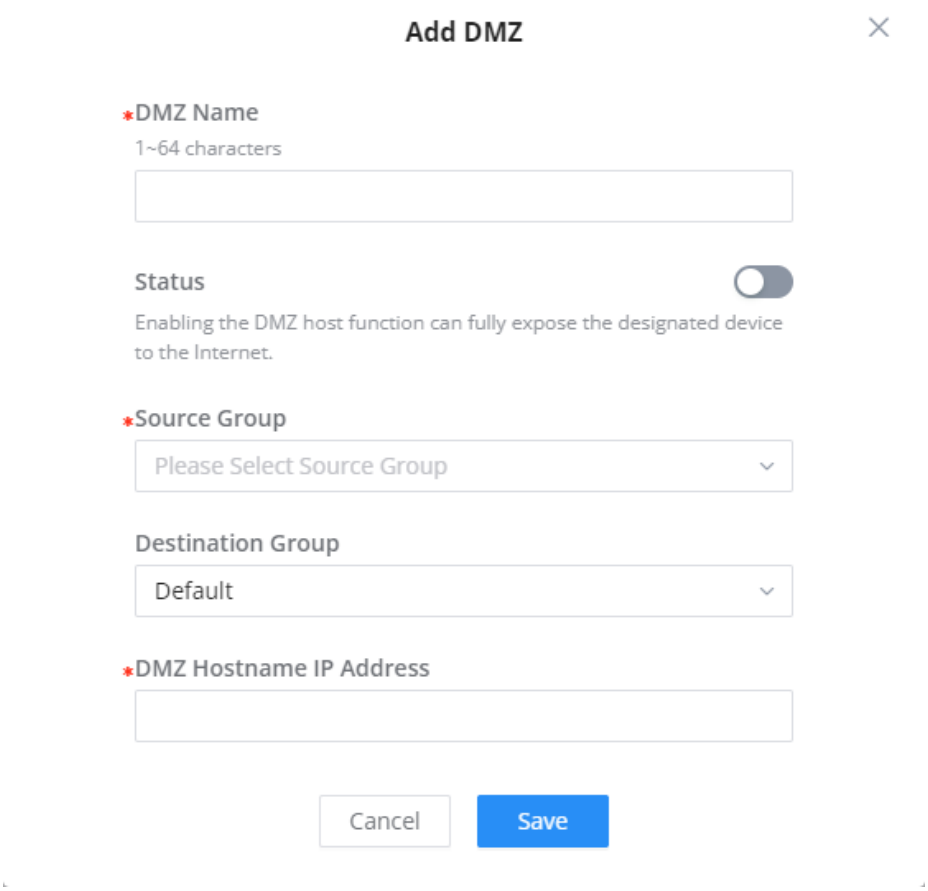


Port Forwarding Clone

DMZ

Configuring the DMZ, the GCC6020 will allow all external access requests to the DMZ host. This is

This section can be accessed from **Web GUI -> External Access -> DMZ**.
GCC6020 supports **DMZ**, where it is possible to specify a Hostname IP Address to be put on the **DMZ**.



DMZ Page

Enabling the DMZ host function, the computer set as the DMZ host can be completely exposed to the Internet, realizing two-way unrestricted communication.

Refer to the table below for DMZ fields:

DMZ Name	Enter a name for the DMZ rule.
Status	Toggle on/off the status of the DMZ rule.
Source Group	Select the interface to allow access to the DMZ host.
Destination Group	Select the VLAN on which the DMZ host belong.
DMZ Hostname IP Address	Enter the DMZ host IP address.

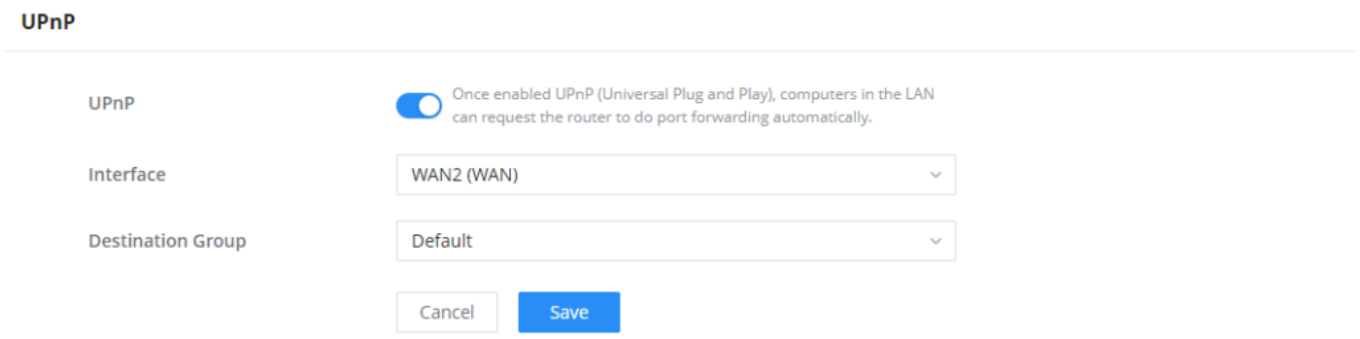
DMZ Page

UPnP

GCC602x supports UPnP, which enables programs running on a host to configure automatically port forwarding.

UPnP allows a program to make the GCC6020 open necessary ports without any intervention from the user, without making any checks.

UPnP settings can be accessed from GCC602x **Web GUI -> External Access -> UPnP.**

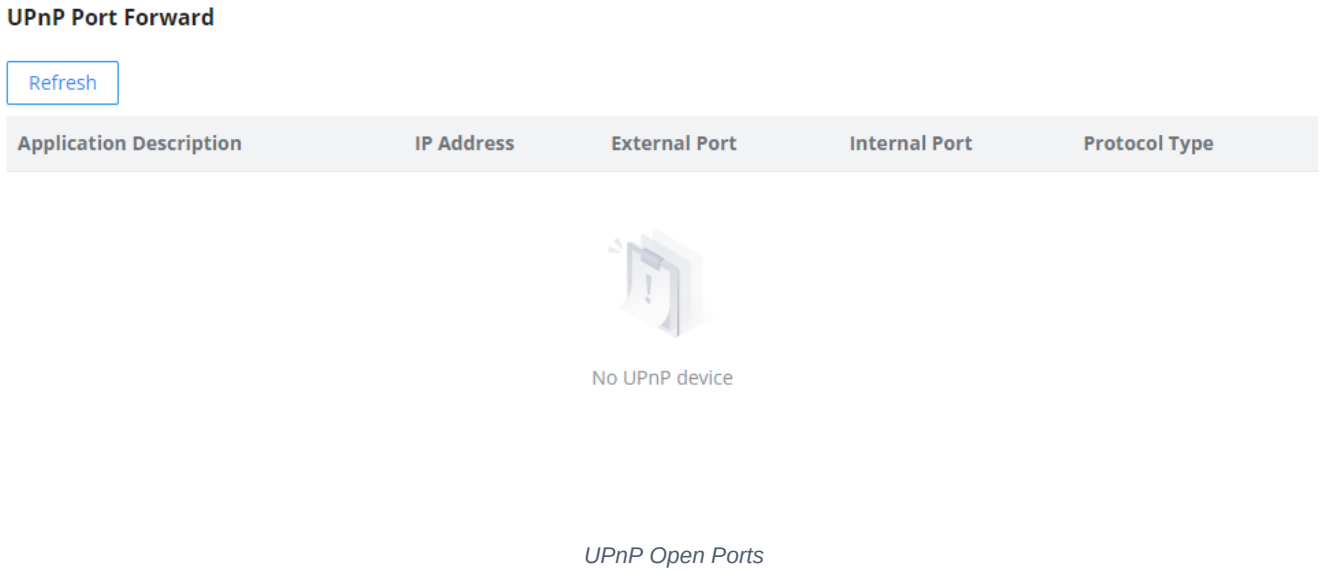


UPnP Settings

UPnP	Click on "ON" to enable UPnP.Note: Once enabled UPnP (Universal Plug and Play), computers in the LAN can request the router to do port forwarding automatically
Interface	Select the interface (WAN)
Destination Group	Select the LAN Group

UPnP Settings

When UPnP is enabled, the ports will be shown in the section below. The information shown includes the application name, IP address of the LAN host that has requested the opening of the port, the external port number, the internet port number, and the transport protocol used (UDP or TCP).

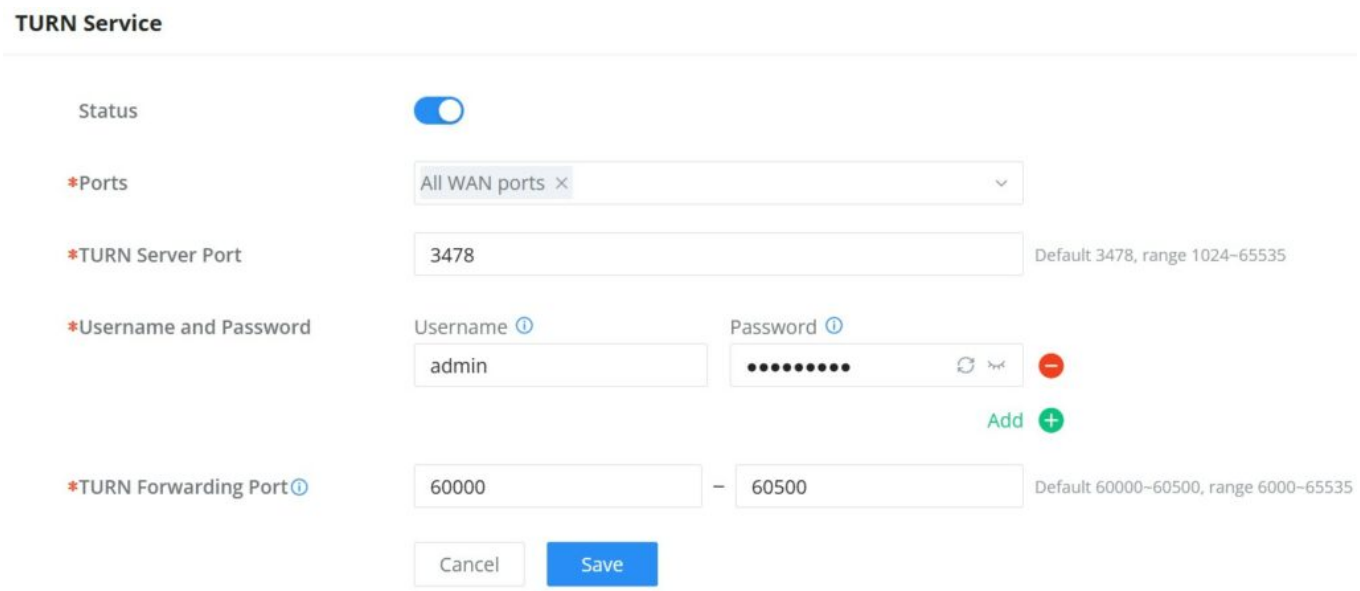


UPnP Open Ports

TURN Service

TURN stands for Traversal Using Relays around NAT, and it's a network service that helps establish peer-to-peer connections between devices that are behind a NAT or Firewall. Real-time communication like video conferencing, Voice over IP, etc benefit from the TURN service to establish connections between peers when the NAT or the Firewall blocks or modifies the traffic.

Navigate to **Web UI -> External Access -> TURN Service**. The service is OFF by default; toggle Status ON to turn on the service. The default TURN Server Port is 3478; it is also possible to add or remove a username and password by clicking on the "**minus**" and "**Plus**" icons.



TURN Service

- The TURN server port is by default 3478.
- For Turn Forwarding Port: do not modify the forwarding port range unless necessary. Ensure that the ports used by other services do not conflict with the TURN forwarding ports.
- TURN service is a NAT traversal solution for UC in a private network and a VoIP media traffic NAT traversal gateway for Grandstream UCM and Wave.

MAINTENANCE

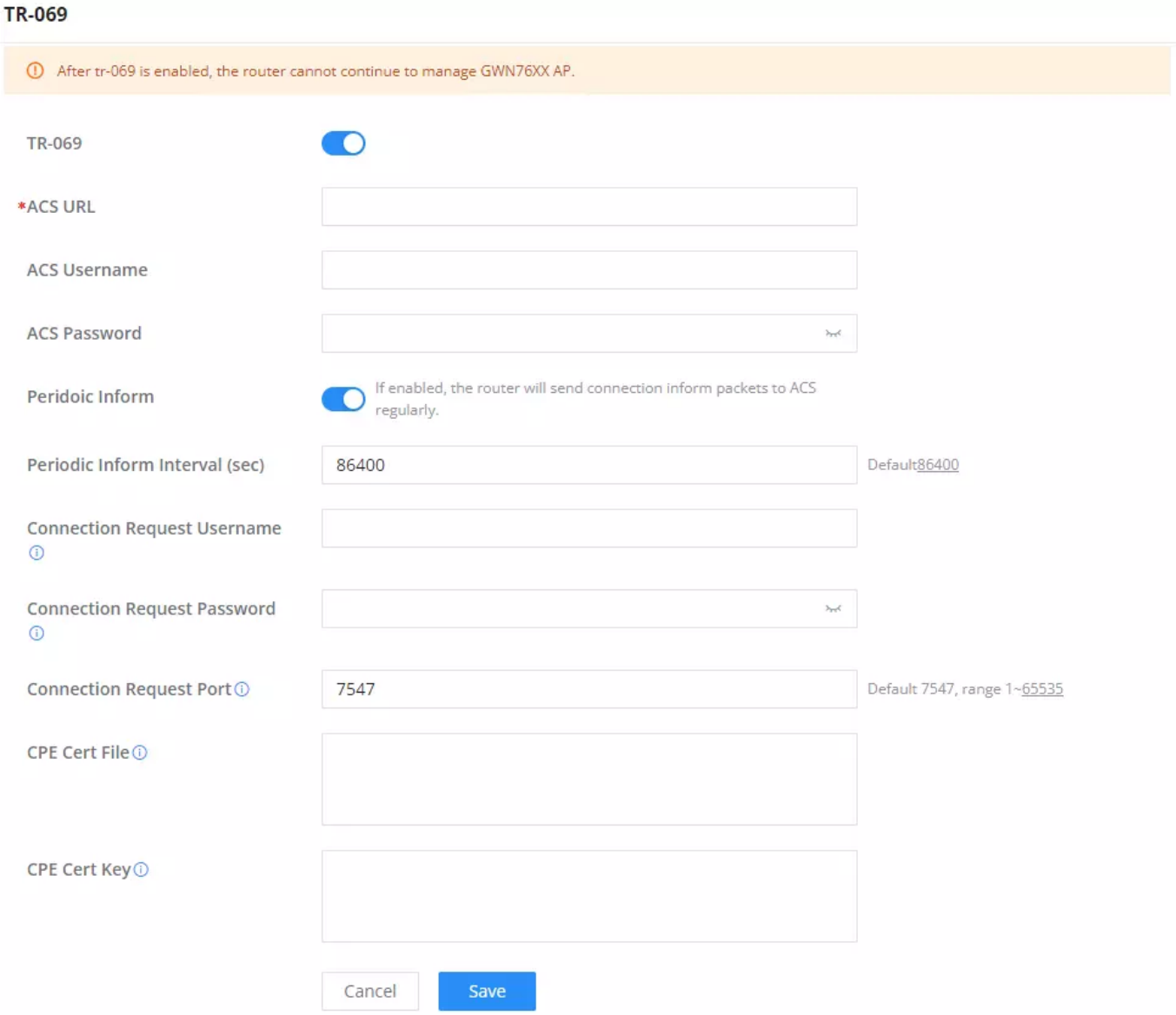
GCC602x offers multiple tools and options for maintenance and debugging to help further troubleshooting and monitoring the GCC6020 resources.

TR-069

It is a protocol for communication between CPE (Customer Premise Equipment) and an ACS (Auto Configuration Server) that provides secure auto-configuration as well as other CPE management functions within a common framework.

TR-069 stands for a "Technical Report" defined by the Broadband Forum that specifies the CWMP "CPE WAN Management Protocol". It commonly uses HTTP or HTTPS as transport for communication between CPE and the ACS. The message exchange uses SOAP (XML_RPC) for the configuration and management of the device.

If enabled, GCC6020 cannot continue to manage GWN devices.



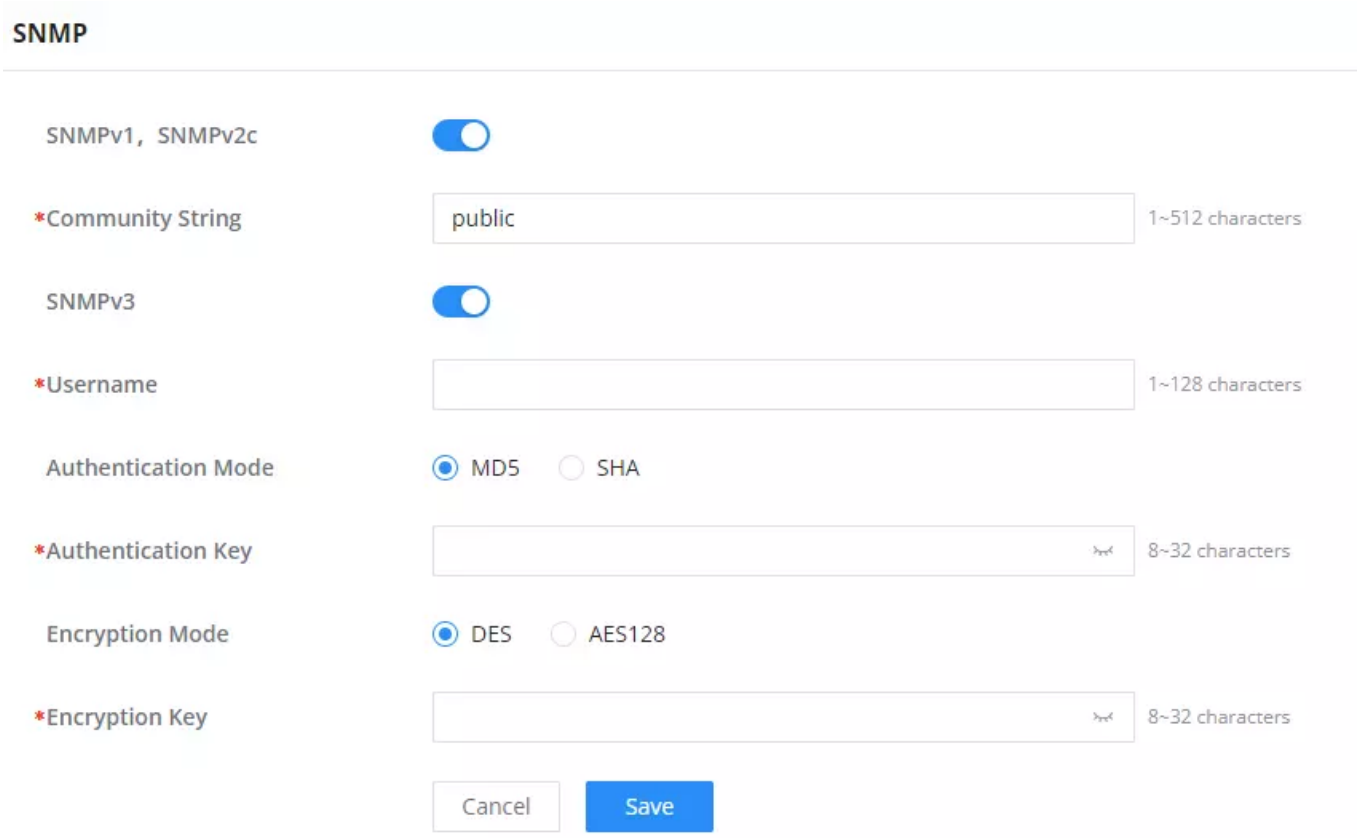
TR 069 page

TR-069	Enable/disable TR-069
ACS URL	Enter the FQDN or the IP address of the ACS server.
ACS Username	Enter the username.
ACS Password	Enter the password.
Periodic Inform	If enabled, the GCC6020 will send connection inform packets to ACS regularly.
Periodic Inform Interval (sec)	This configures the time duration between each inform sent by the device to the ACS server.
Connection Request Username	When ACS server sends a connection request to the device, the username that the device authenticates ACS must be consistent with the configuration of ACS side.
Connection Request Password	The password that the device authenticates ACS must be consistent with the configuration of ACS server.
Connection Request Port	The port for ACS to send connection request to the GCC6020. This port cannot be occupied by other device features.
CPE Cert File	Enter the certificate that the device needs to use when connecting to ACS through SSL.
CPE Cert Key	Enter the certificate key that the device needs to use when connecting to ACS through SSL.

SNMP

GCC6020 supports SNMP (Simple Network Management Protocol), which is widely used in network management for network monitoring to collect information about monitored devices.

To configure SNMP settings, go to **Web GUI -> Maintenance -> SNMP**. On this page, the user can either enable SNMPv1, SNMPv2c, or SNMPv3, and enter all the necessary parameters.



SNMP

To configure SNMPv1 or SNMPv2, please refer to the table below:

SNMPv1, SNMPv2	Enable/disable SNMPv1 and SNMPv2
Community String	Enter the shared password of the community. Note:

SNMP - SNMPv1 or SNMPv2

To configure SNMPv3, please refer to the table below:

SNMPv3	Enable/disable SNMPv3.
Username	Enter a username.
Authentication Mode	Select the algorithm used for the authentication.
Authentication Key	Select the authentication password.
Encryption Mode	Select the encryption protocol used for the encryption of the data.
Encryption Key	Enter the encryption key.

SNMP - SNMPv3

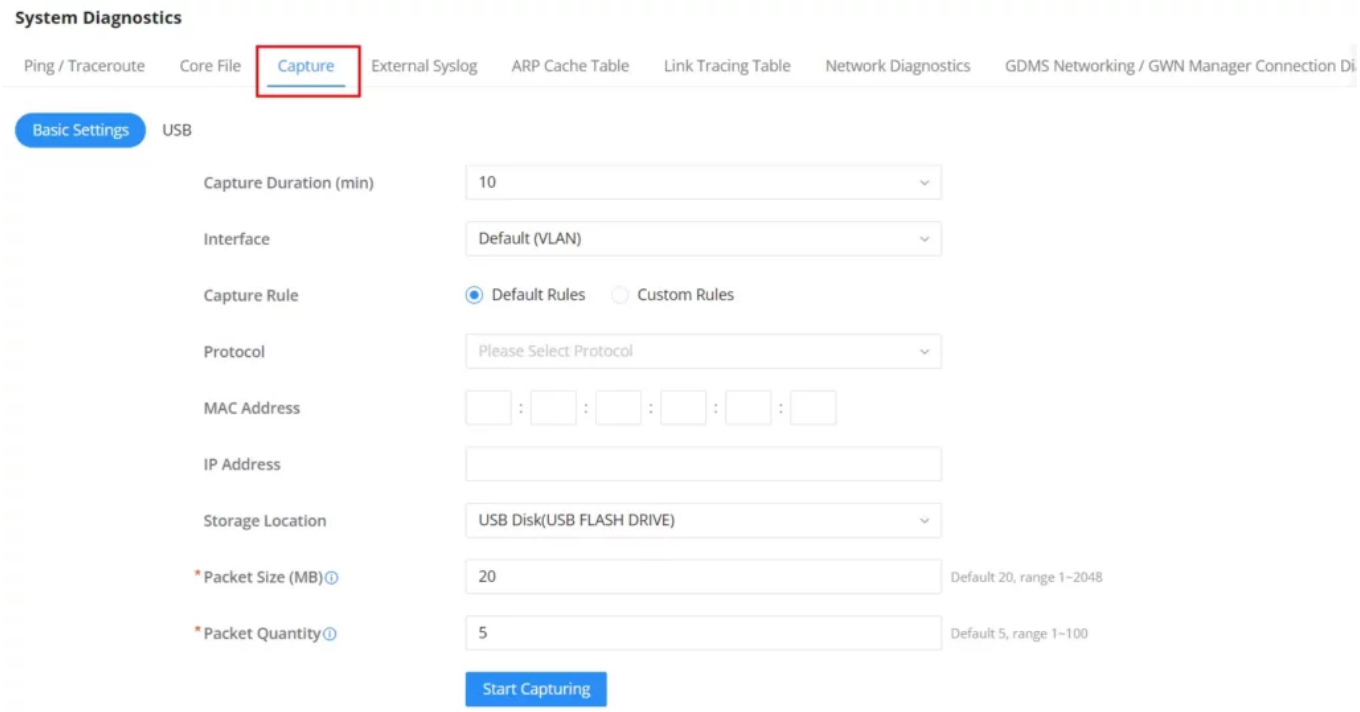
System Diagnostics

Many debugging tools are available on GCC6020's Web GUI to check the status and troubleshoot GCC6020's services and networks.

To access these tools, navigate to **"Web UI -> System Settings -> System Diagnosis"**

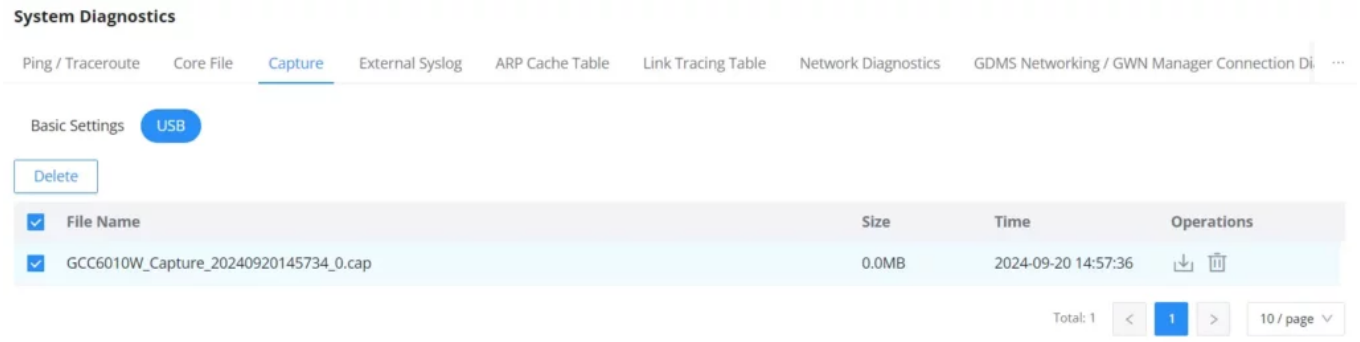
Capture

This section is used to capture packet traces from the GCC6020 interfaces (WAN ports and network groups) for troubleshooting purposes or monitoring. It's even possible to capture based on MAC address or IP Address; once done, the user can click the "Start Capturing" button and the file (CAP) will start downloading right away. It's also possible to select the storage location (internal storage, USB, microSD, or SSD) if available.



System diagnostics Capture

If a storage option is available and the capture file is stored on it, the storage option tab will list the available capture files to download to your local machine or delete to save storage.



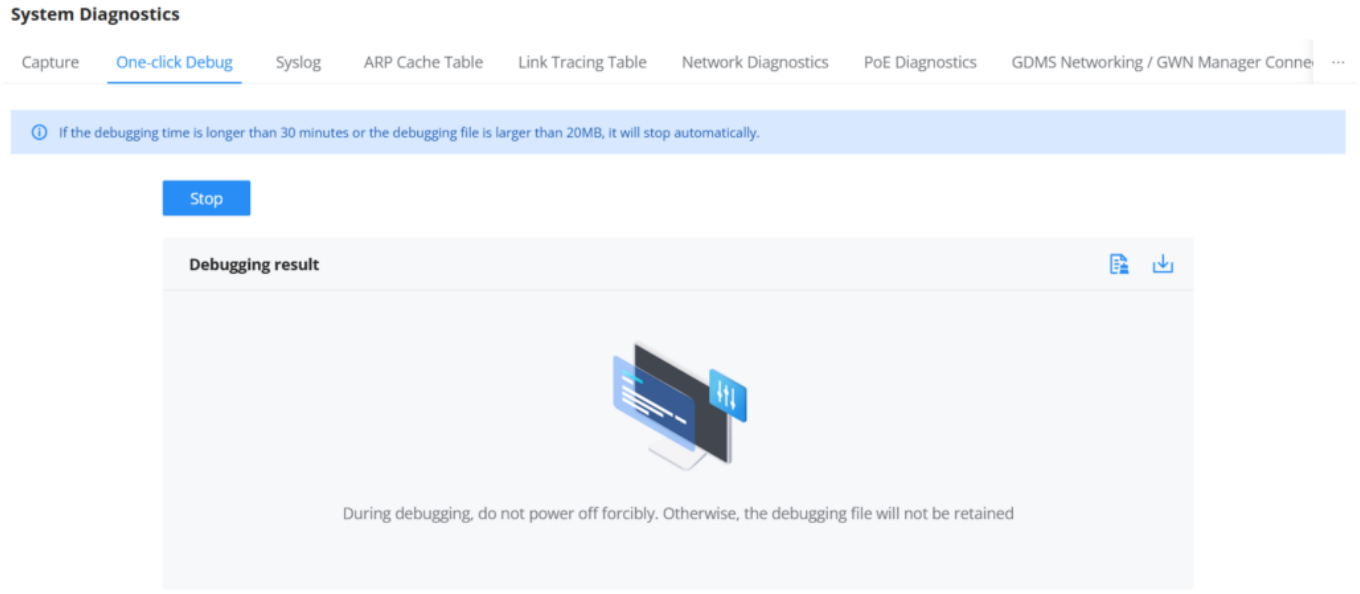
Capture USB storage

One-click Debug

The **One-click Debug** feature allows administrators to capture system logs and diagnostic data automatically for troubleshooting purposes. It runs a background process and provides a downloadable file with debugging results.

How It Works:

- Click **Start** to begin capturing logs.
- The process will stop automatically if:
    - It exceeds **30 minutes**, or
    - The debug file reaches **20MB**.
- Once completed, the debug result can be downloaded using the **download** icon.



One click Debug

Important Notes:

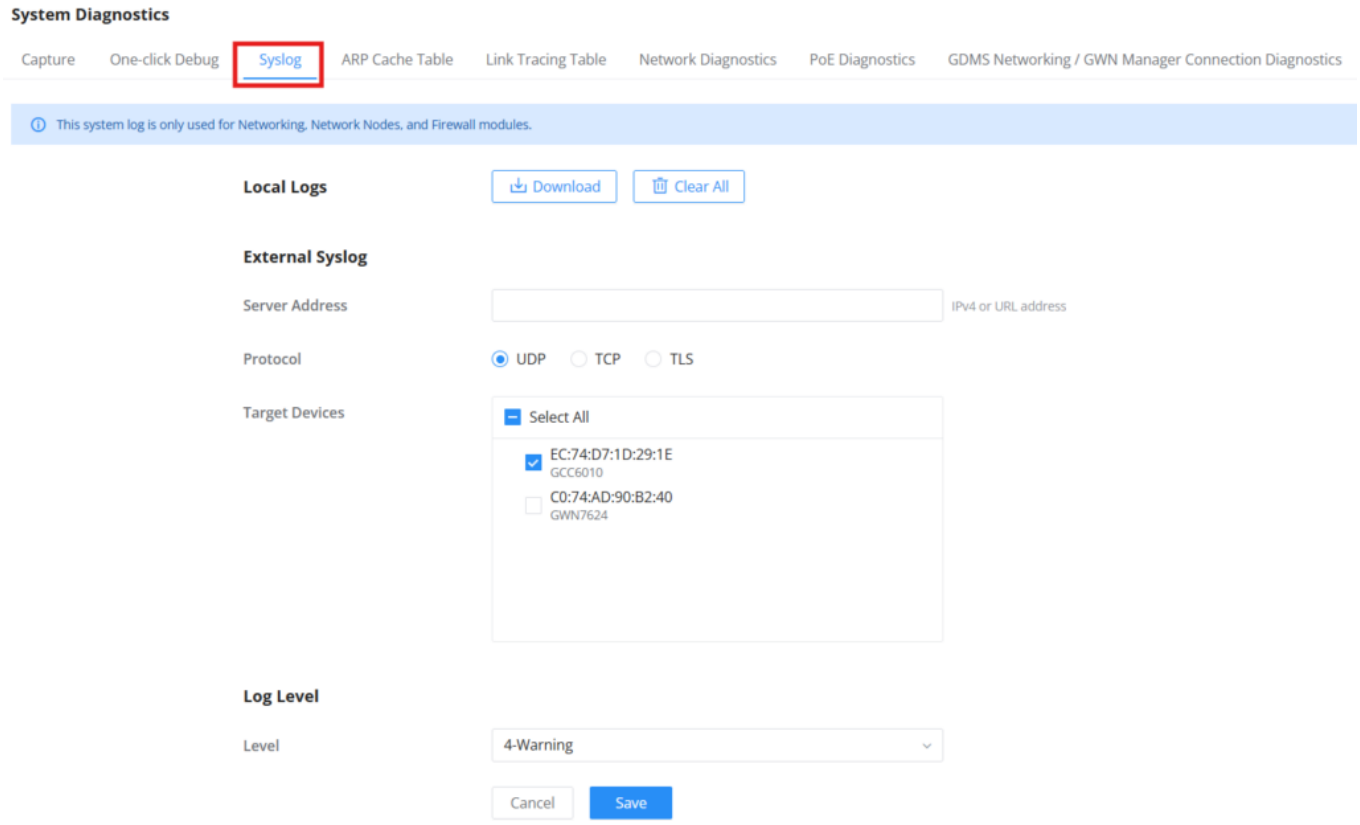
- **Do not power off** the device during debugging; otherwise, the debug file will not be saved.
- Use this tool when requested by support or when diagnosing persistent system issues.

Syslog

The **Syslog** page allows you to collect and manage system logs for Networking, Network Nodes, and Firewall modules. Logs can be stored locally or forwarded to an external syslog server using standard protocols.

GCC6020 supports dumping the Syslog information to a remote server under **Web GUI** -> **System Settings -> System Diagnosis** -> **Syslog Tab**

Enter the Syslog server Hostname or IP address and select the level for the Syslog information. Nine levels of Syslog are available: None, Emergency, Alert, Critical, Error, Warning, Notice, Information, and Debug.



Syslog

Field	Description
Local Logs	View and manage stored logs directly on the device. * Download - Export logs as a file. * Clear All - Delete all stored logs.
Server Address	Enter the IPv4 or URL of the external syslog server.
Protocol	Select the transport protocol: UDP, TCP, or TLS.
Target Devices	Select one or more devices to monitor with the syslog output.
Log Level	Choose the minimum severity level to be captured: * None * Debug * Info * Notice * Warning * Error * Critical * Alert * Emergency

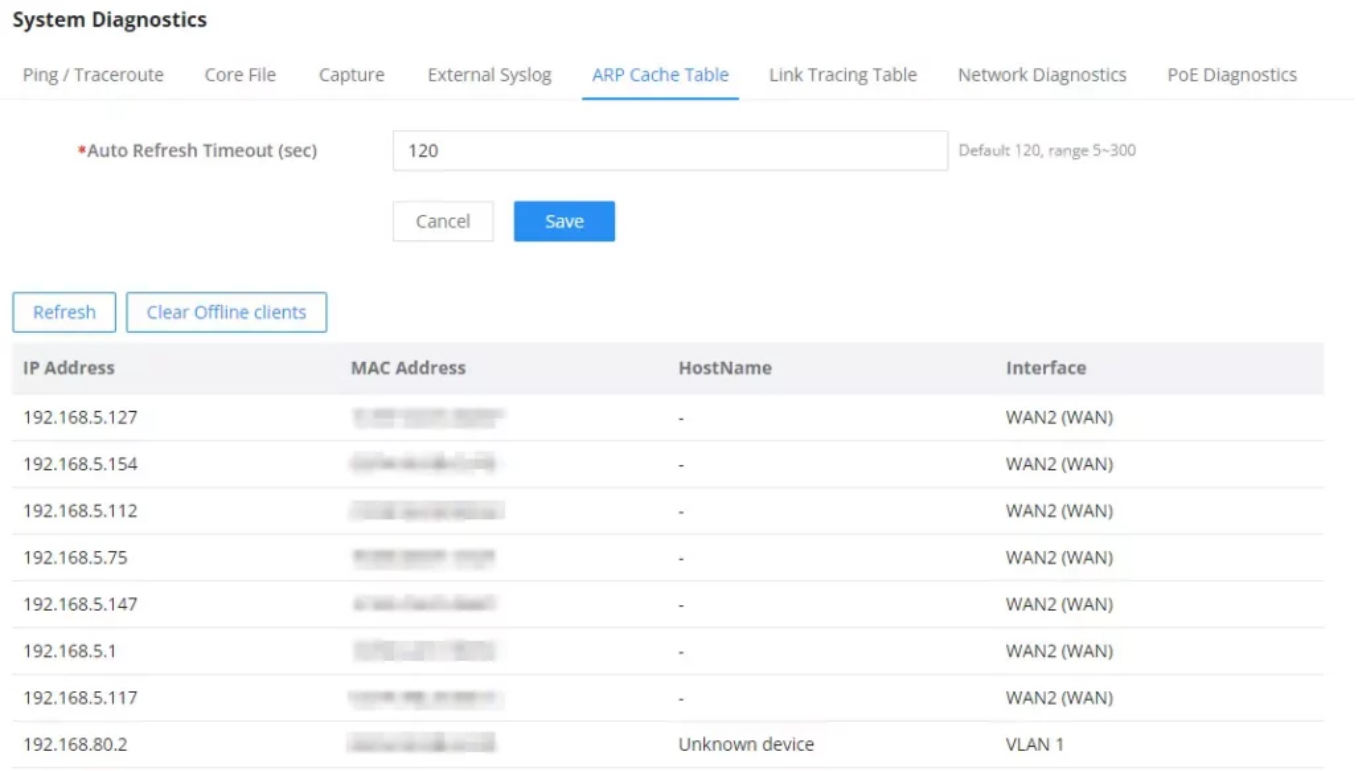
Syslog

Notes:

- This system log applies **only to Networking, Network Nodes, and Firewall modules**.
- Be sure to configure an appropriate log level to avoid unnecessary noise or missed issues.

ARP Cache Table

GCC602x keeps an ARP table record of all the devices that have been assigned an IP address from the GCC602x. The record will keep the device's information when the device is offline. To access the ARP Cache Table, please navigate to **System Diagnostics -> ARP Cache Table**.

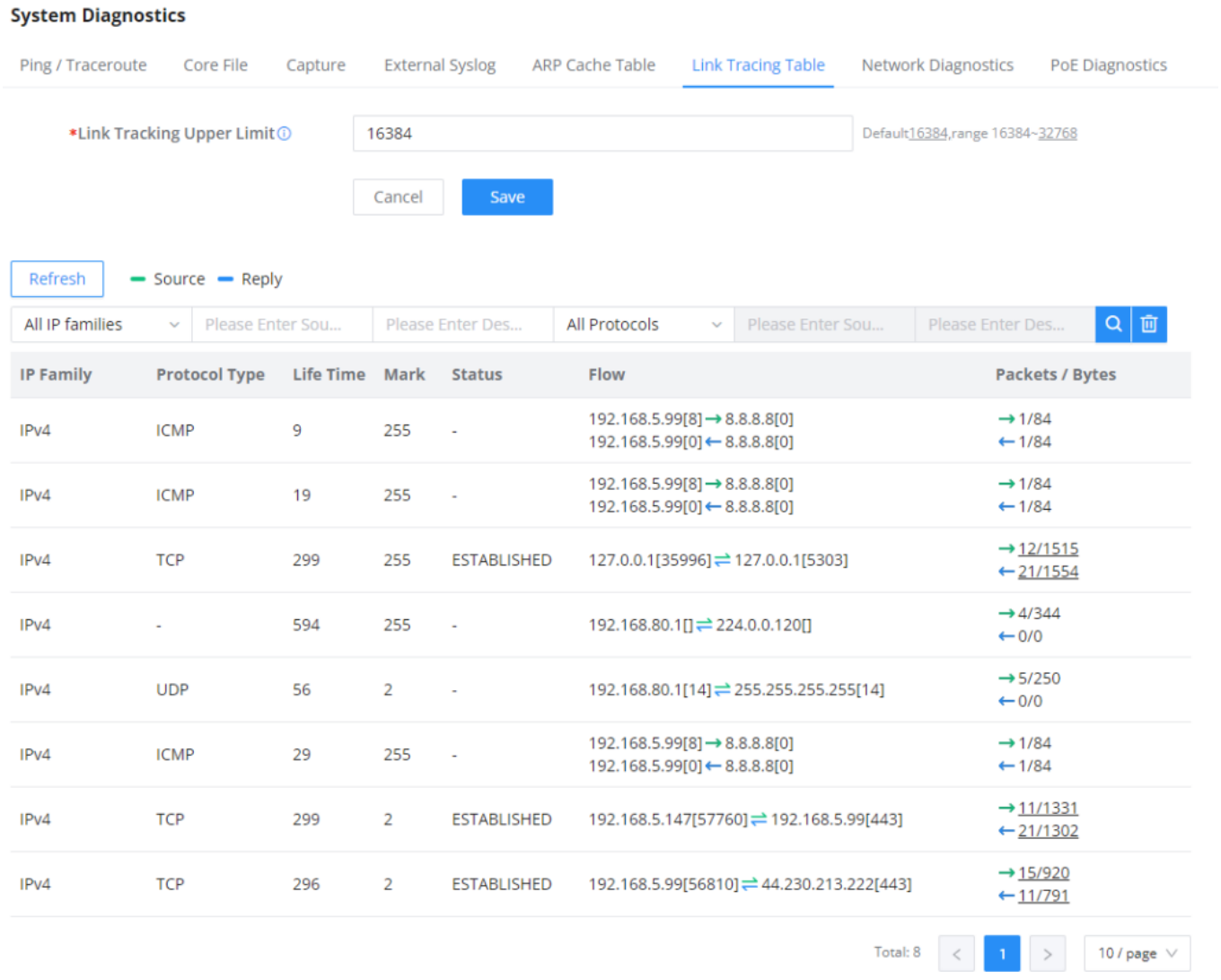


ARP Cache Table

Link Tracing Table

The Link Tracing Table shows the flow of traffic by displaying the source IP address/Port (the green color) and the reply IP address/port (the blue color). Also, other information can be displayed, such as IP Family, Protocol Type, Lifetime, Status, Packets/Bytes, etc.

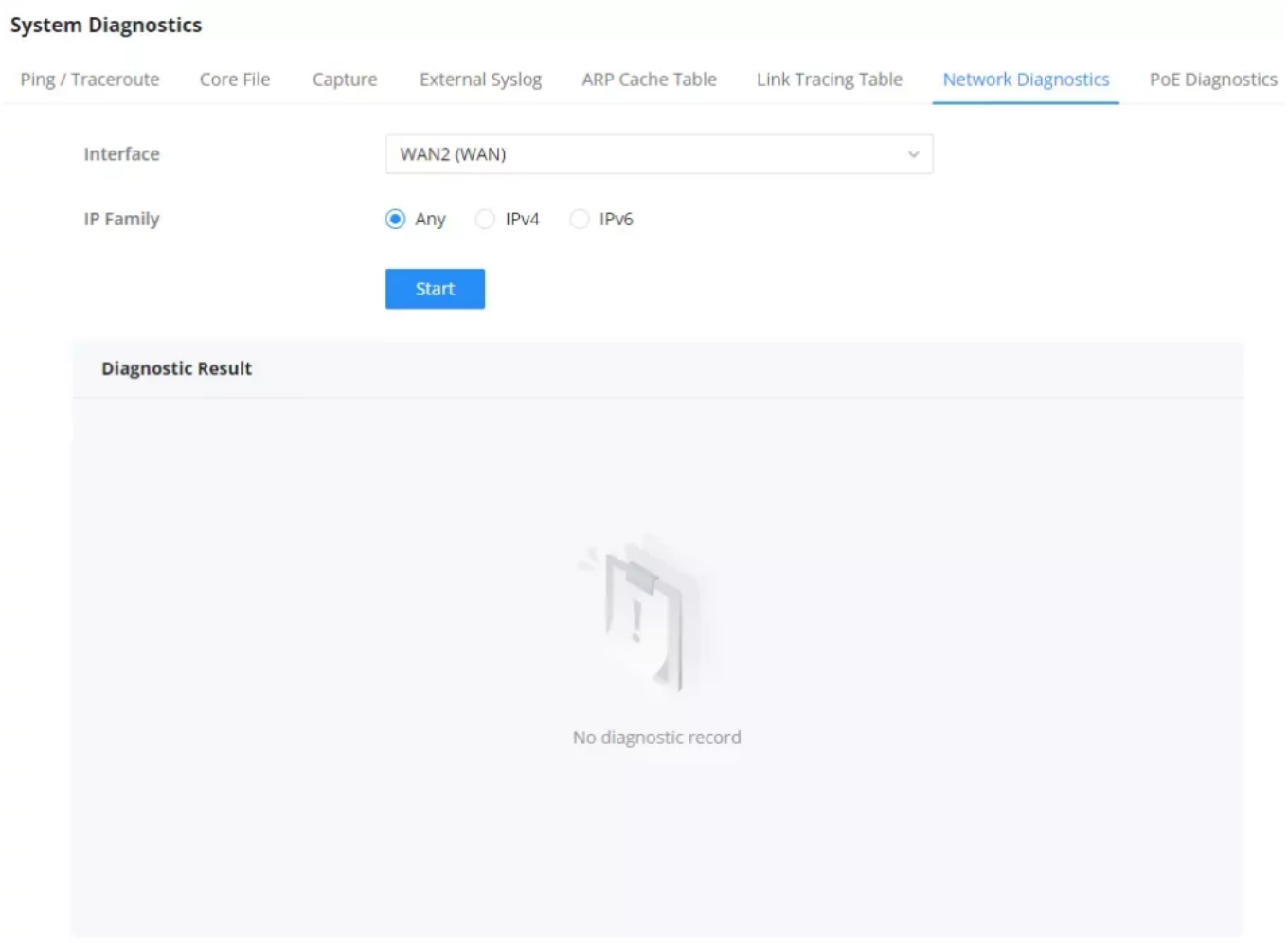
Users/Administrators can also delete the flow of certain IP addresses/Ports (Source and Destination) or then click on the "**Delete**" button to clear the link tracing statistics.



Link Tracing Table

Network Diagnostics

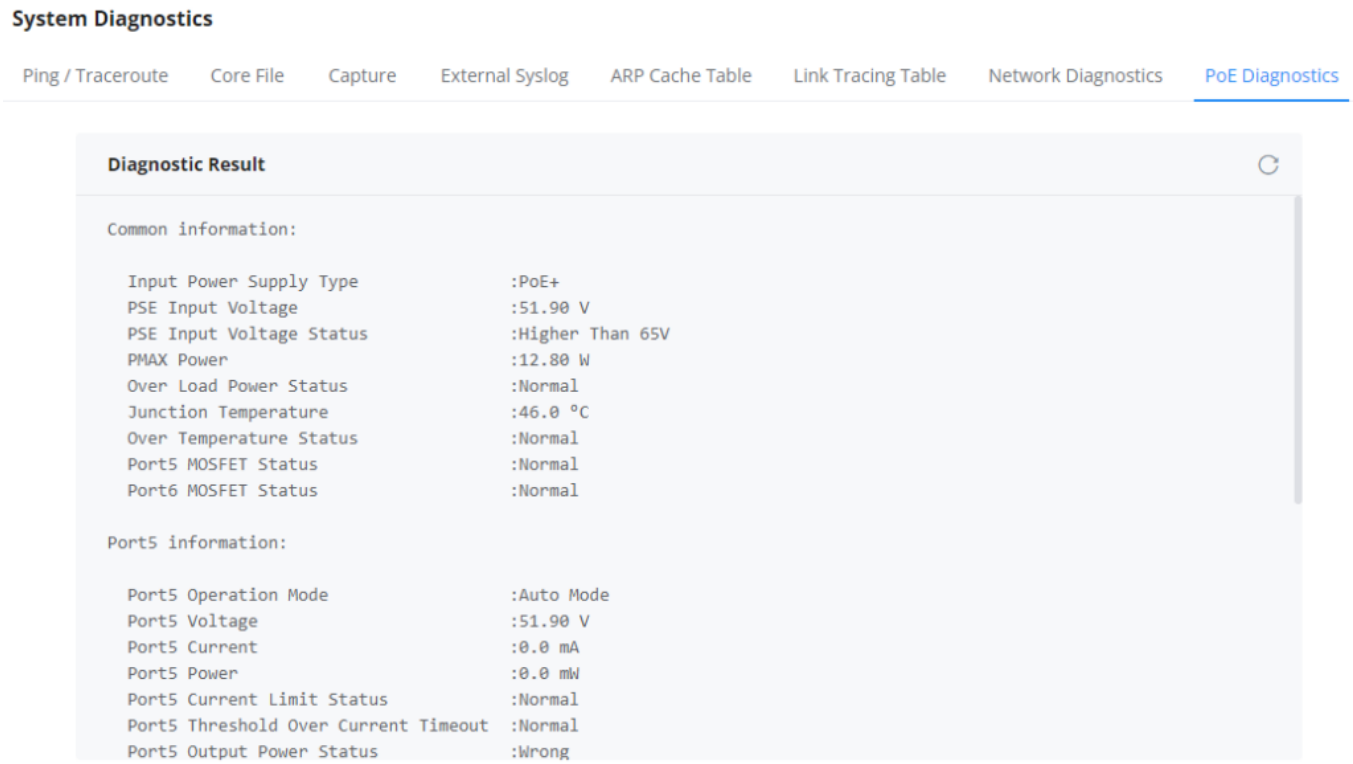
The Network Diagnostics feature allows the user to quickly diagnose the connection link on a specific WAN interface.



Network Diagnostics

PoE Diagnostics

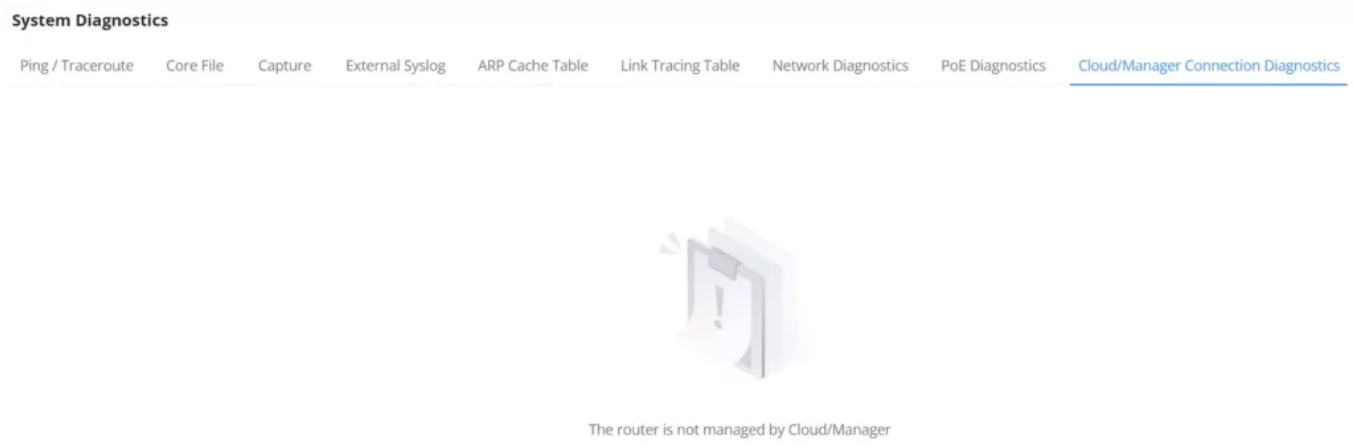
The PoE Diagnostics page offers insight about the ports and their components as well as the power used and the temperature. The information provided can be useful when the user encounters an issue with the PoE function of the GCC6020.



PoE Diagnostics

Cloud/Manager Connection Diagnostics

When the GCC6020 device is added to GDMS.Cloud or GWN Manager, users can check the connection status (connected or not) and even diagnose the problem.

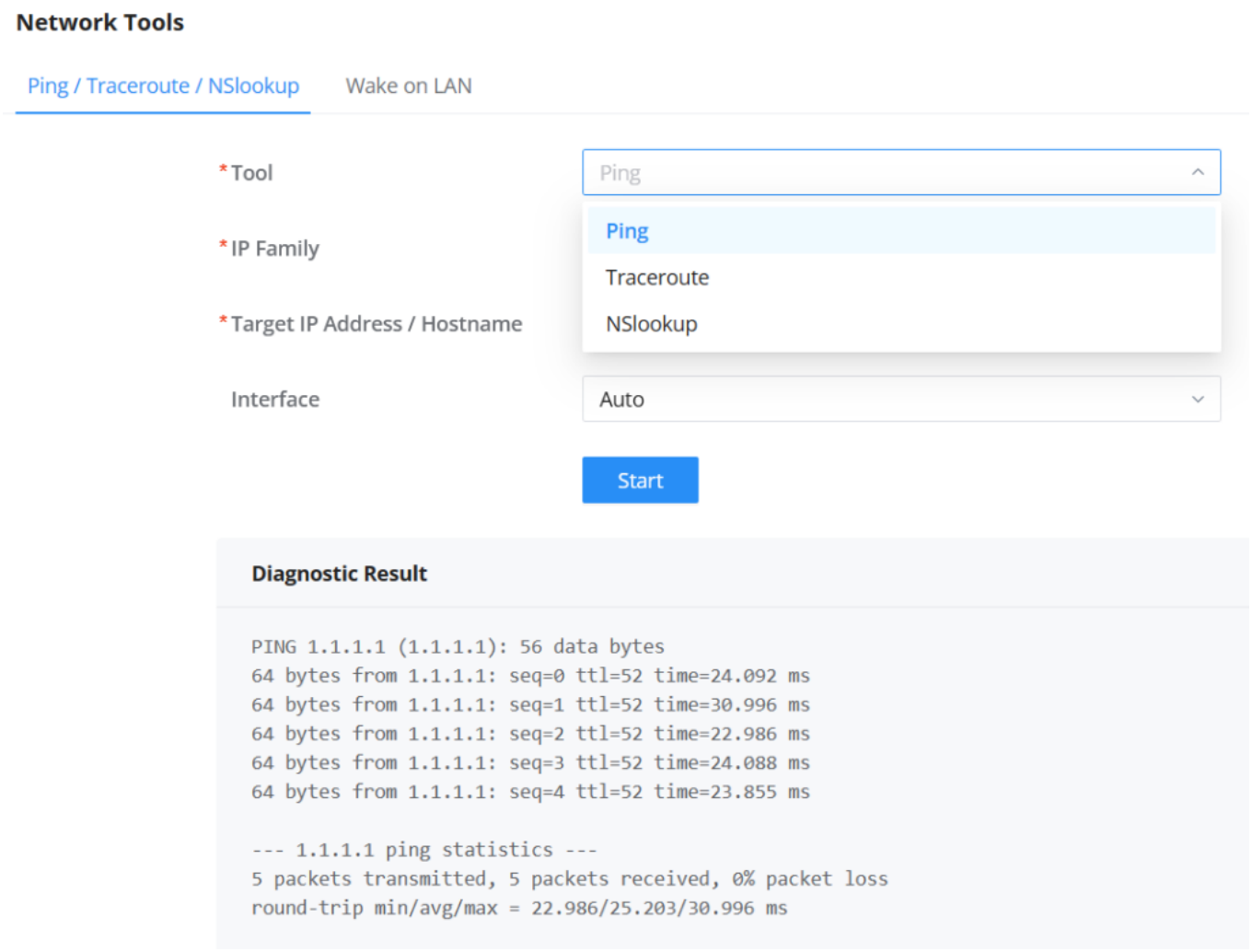


CloudManager Connection Diagnostics

Network tools

Ping/Traceroute/NSlookup

The **Network Tools** section provides essential diagnostic utilities to troubleshoot network connectivity issues. You can select between **Ping**, **Traceroute**, and **NSlookup** to verify reachability and trace network paths to a remote host.



PingTracerouteNSlookup

Field	Description
Tool	Choose the diagnostic method: * Ping - Tests connectivity to a host. * Traceroute - Displays the path packets take to reach the destination. * NSlookup - Resolves domain names to IP addresses.
IP Family	Select IPv4 or IPv6 for the test.
Target IP Address / Hostname	Enter the destination address or domain name to test.
Interface	(Optional) Select the interface to use for testing. Default is Auto.
Start	Click to execute the selected test.

Diagnostic Result:

After running a tool, the result is displayed in the **Diagnostic Result** section below the form, showing real-time output for the selected diagnostic.

Wake on LAN

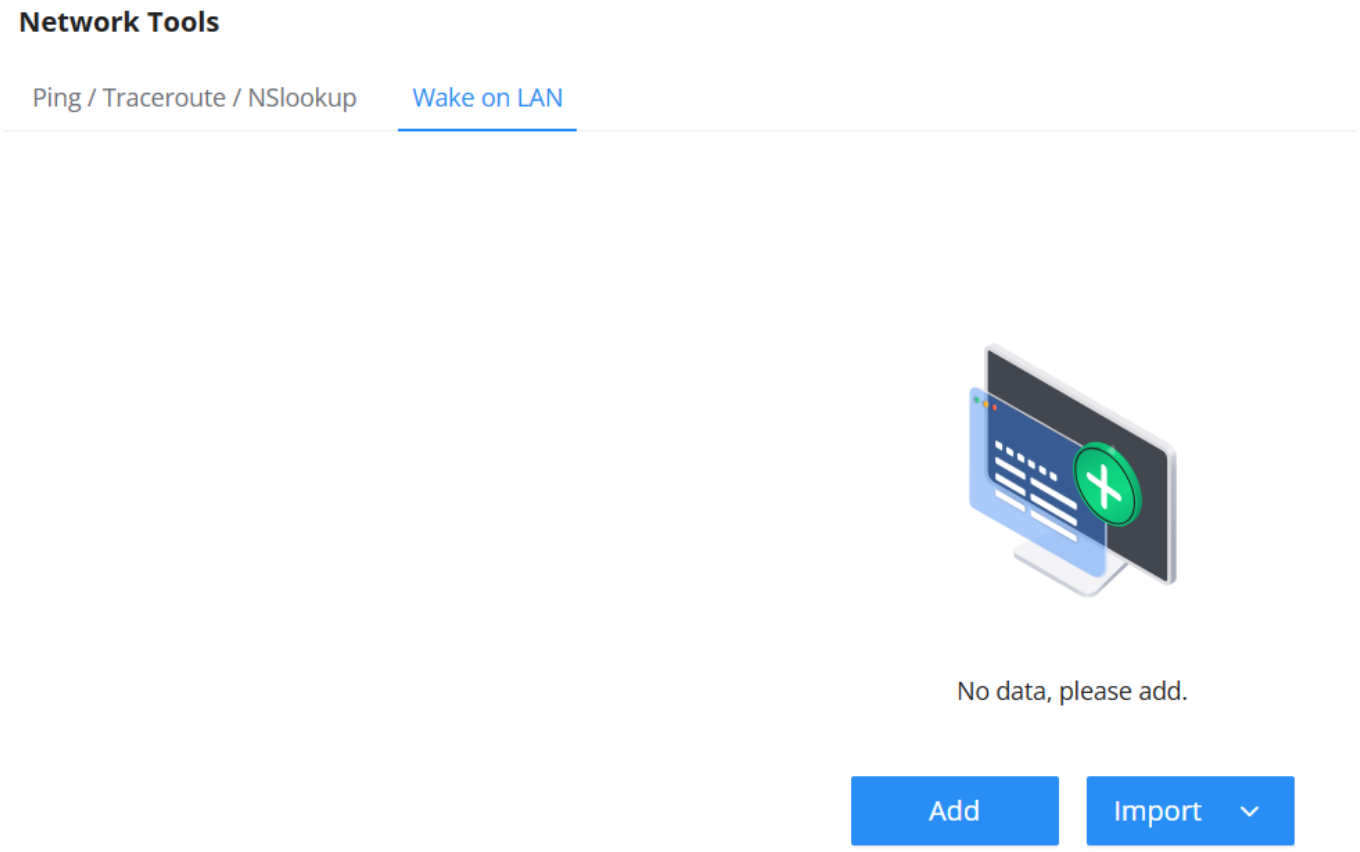
The **Wake on LAN** feature allows administrators to remotely power on devices within the same LAN using a "magic packet." Devices must be connected via wired Ethernet for this function to operate correctly.

Ensure the target device is on the same LAN and connected via cable. Wake on LAN does not work over Wi-Fi or across different networks.

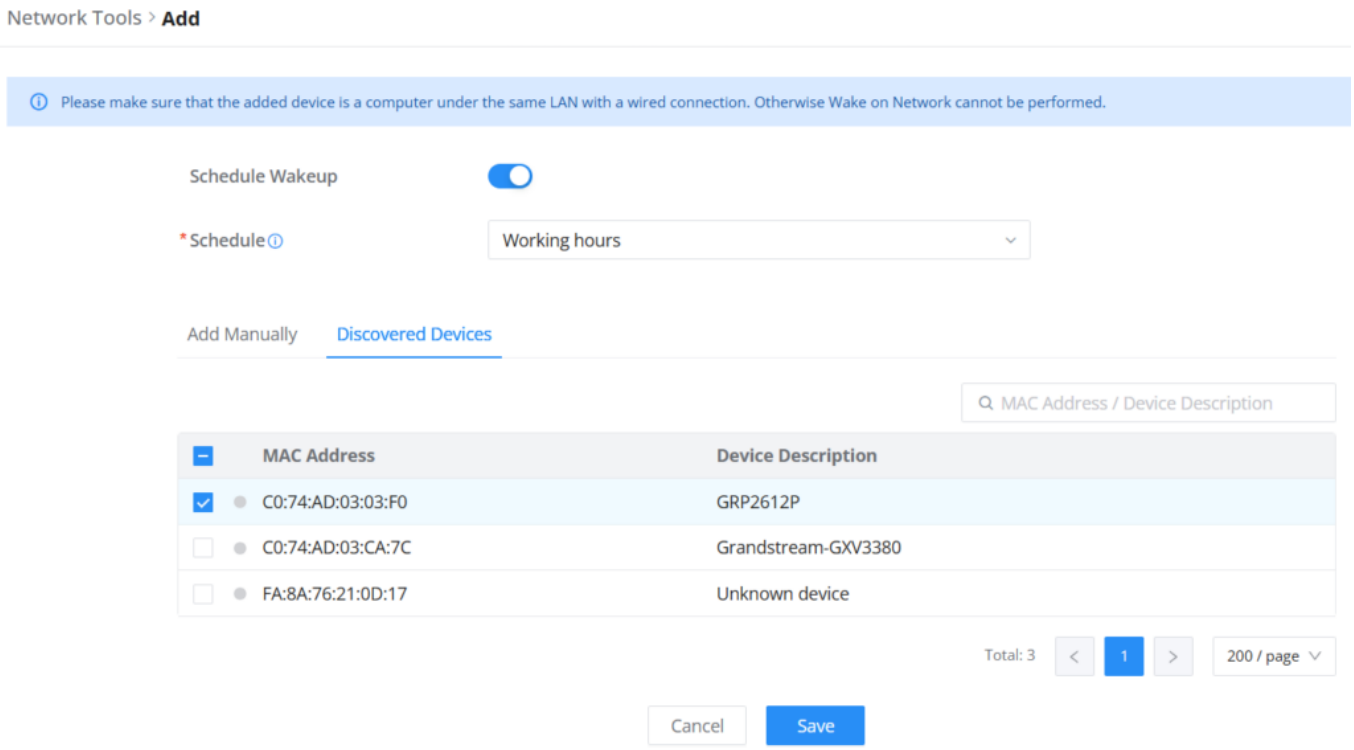
How to Use

1. Click **Add** to register a device.
2. Choose to:

   - **Add Manually:** Enter the device's MAC address and description.
   - **Discovered Devices:** Select from detected devices on the LAN.
3. (Optional) Enable **Schedule Wakeup** to automate power-on at a defined time.
4. Click **Save** to finalize the configuration.



Add Wake on LAN



Wake on LAN

Field Descriptions:

Field	Description
Schedule Wakeup	Enable to send automatic wake-up signals based on a defined schedule.
Schedule	Select a predefined time for automated wake-up commands.
MAC Address	Unique hardware address of the target device.
Device Description	Optional label to identify the device.

Wake on LAN

Alerts & Notifications

Alerts

The Alerts page displays alerts about the network; the user can specify to display only certain types (System, Performance, Security, or Network) or the levels. To check the alerts that have been generated, please navigate to **Maintenance -> Alerts & Notifications page -> Alerts tab.**

The alerts can be displayed either by type or level. However, that is not the only way to display them. The user can filter through the alert log using a date interval or search by MAC address or device name.

Alerts Types

The available types are **System, Performance, Security,** and **Network**, or the user can choose to display all the types.

Alerts Types

Alerts Levels

The user can filter the alert level by the following levels: **All Levels, Emergency, Warning or Notice**.

Alerts Levels

Alert Notification Settings

To enable the notifications on the Alerts tab, please click on the "**Alert Notification Settings**" button as shown below:

Alert Notification Settings

The figures below show all the possible alert notifications that the user can enable on the Alerts tab, organized into 4 categories: **System Alert**, **Performance Alert**, and **Network** Alert.

Please refer to the figures below:

Alert Notification Settings System Alert

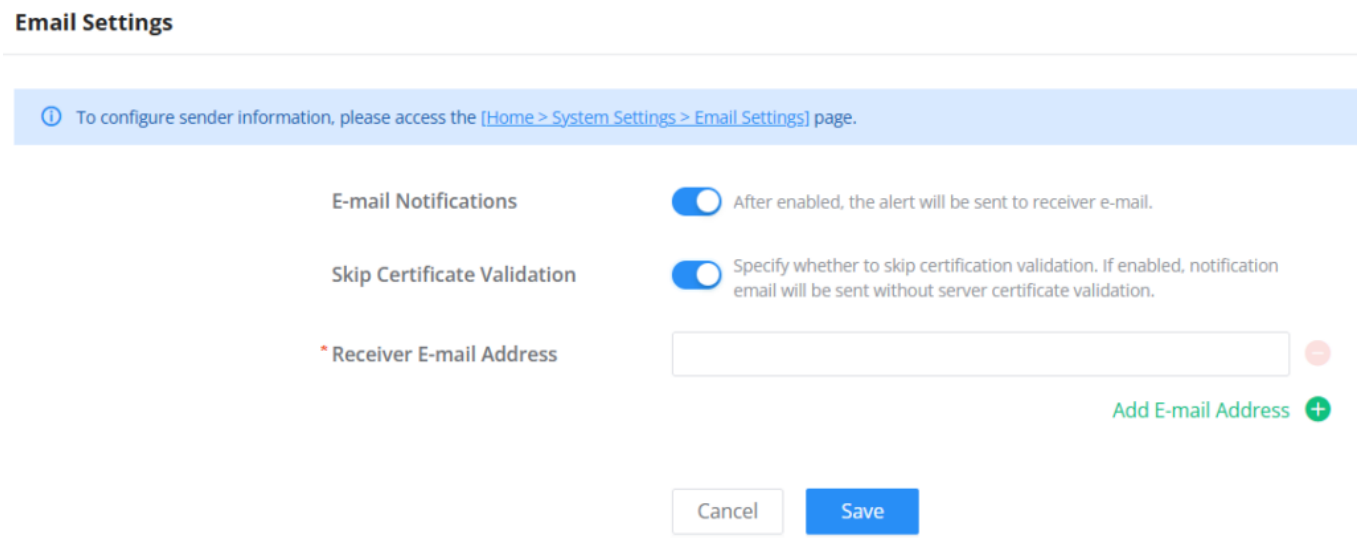
Alert Notification Settings Performance Alert

Alert Notification Settings Network Alert

SYSTEM SETTINGS

Email Settings

The **Email Settings** page allows administrators to configure system email notifications. When enabled, alerts are sent to the specified recipient addresses. This is typically used for system events, errors, or important status updates.



Email Settings

Field Descriptions:

Field	Description
E-mail Notifications	Toggle to enable or disable alert email notifications.
Skip Certificate Validation	When enabled, the system will bypass server certificate checks when sending email. Use with caution.
Receiver E-mail Address	Enter the recipient email address(es) that will receive notifications. Use Add to include multiple.

Email Settings

Note: To configure the **sender email information**, go to: **Home -> System Settings -> Email Settings**.

File Sharing

The GCC6020 devices allow users to share files over the network using **USB flash drives**, **external hard drives**, and **microSD cards**.

When a supported storage device is connected, it will appear in the **External Device List**, and can be accessed by clients on the local network.

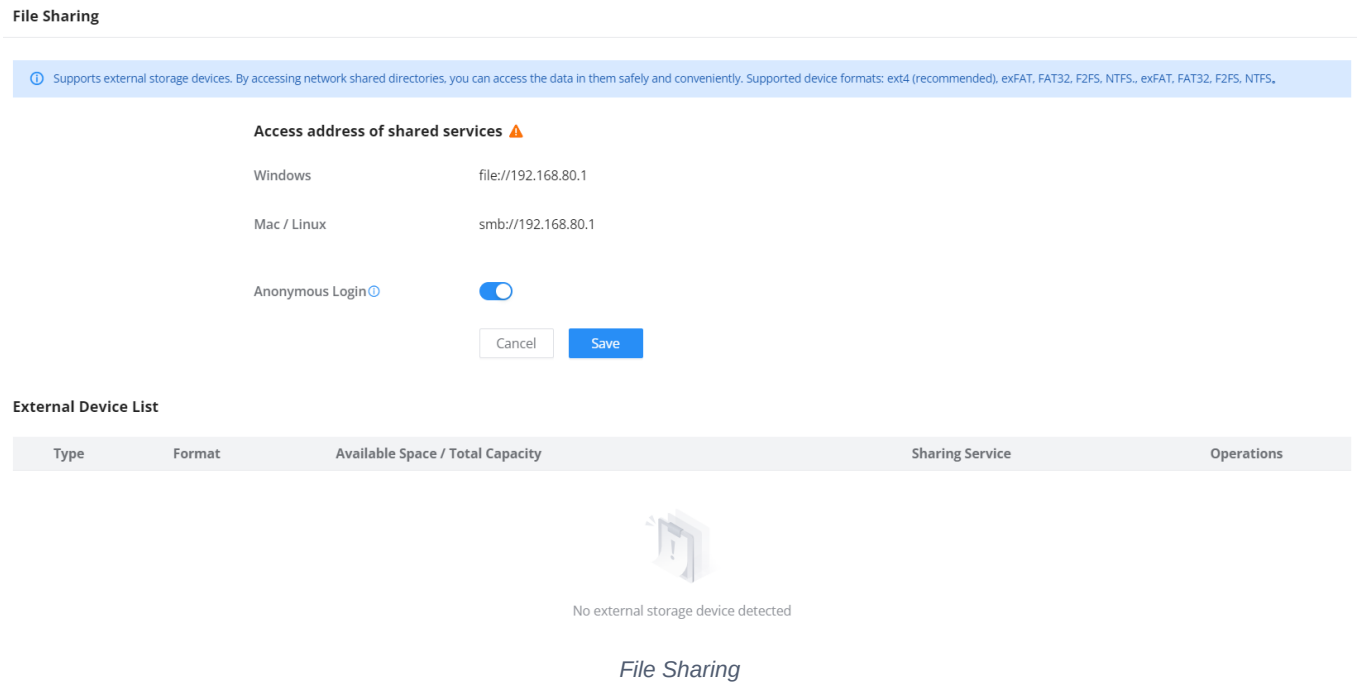
Clients can access shared directories using:

- **Windows**: file://<IP address>
- **Mac/Linux**: smb://<IP address>

Supported formats: **ext4** (recommended), **exFAT**, **FAT32**, **F2FS**, **NTFS**

You can also enable or disable **Anonymous Login** for access control.

Navigate to **System Settings -> File Sharing.**



File Sharing

Profiles

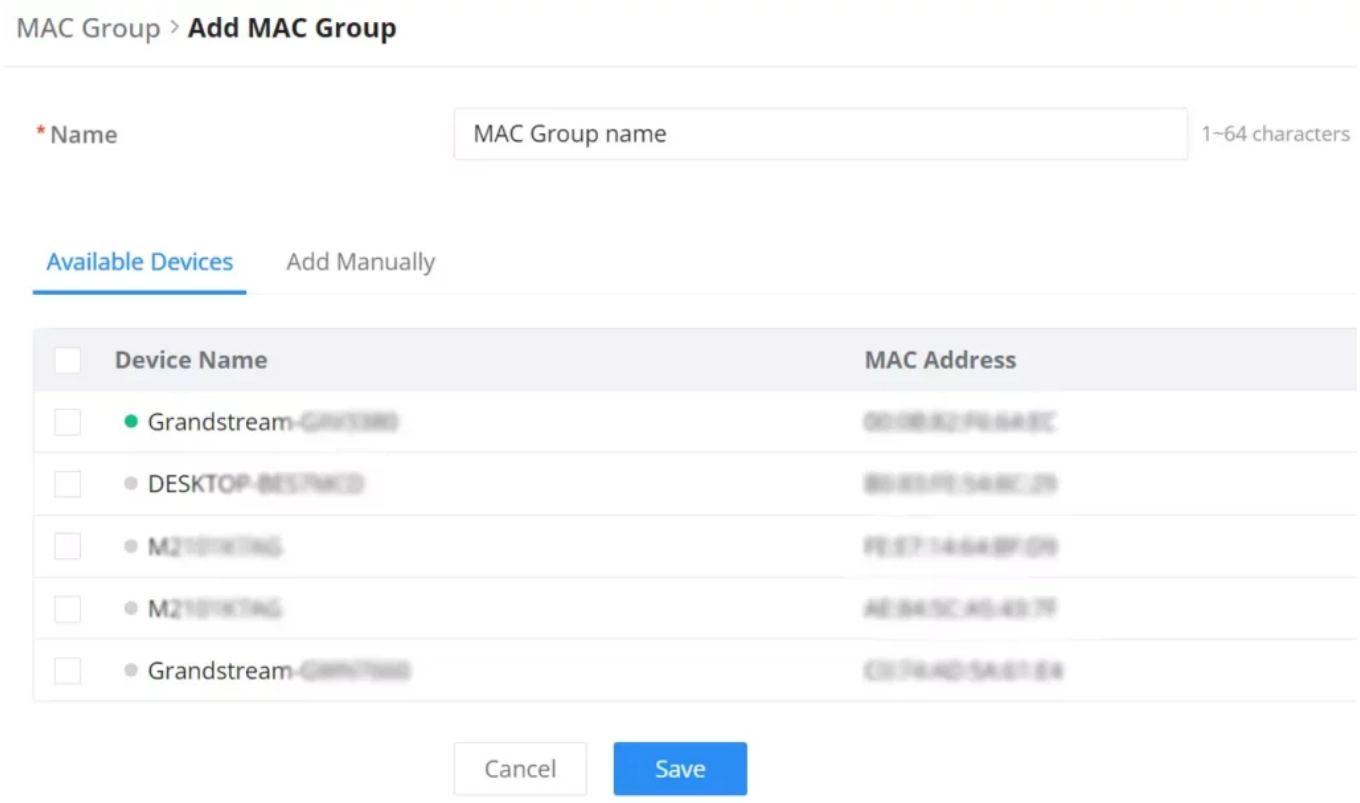
MAC Group

The MAC Group is a feature in GCC devices that enables the user to create a group of MAC addresses from the available ones or manually add the MAC Address.

To create a new MAC group, navigate to: "**Profiles -> MAC Group"** then click the "**Add**" button.

- **Add devices from the list:**

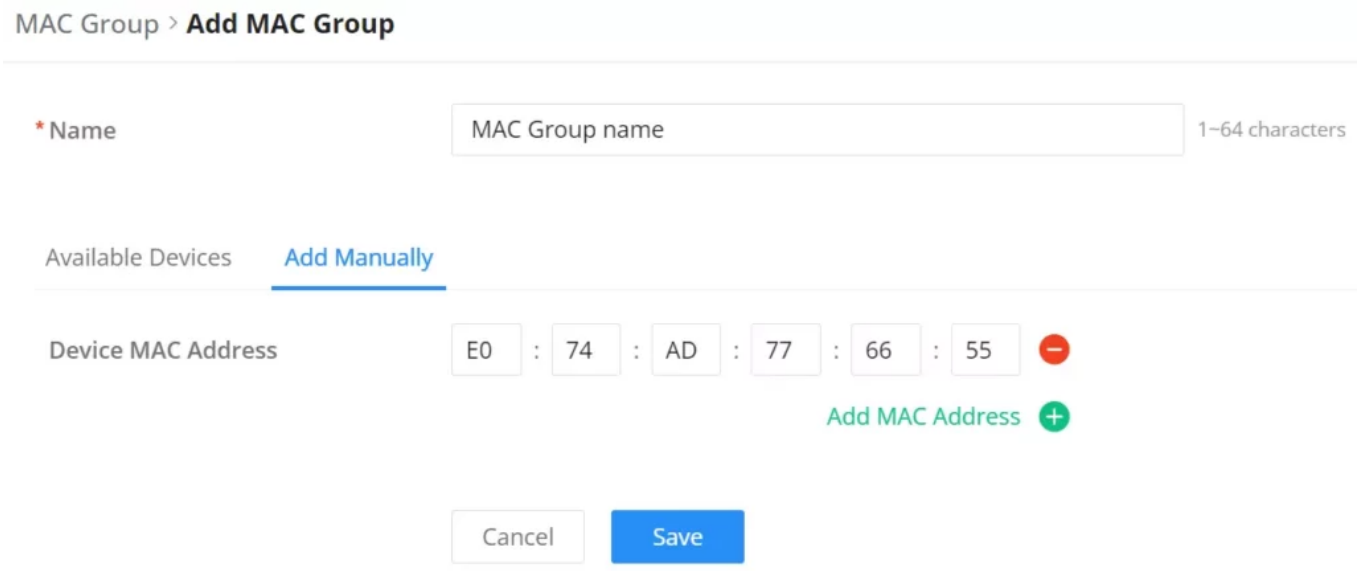
Enter the name of the MAC Group, then add the devices from the list.



Add MAC Group

- **Add Devices Manually:**

Enter the name of the MAC Group, then add the devices' MAC addresses.

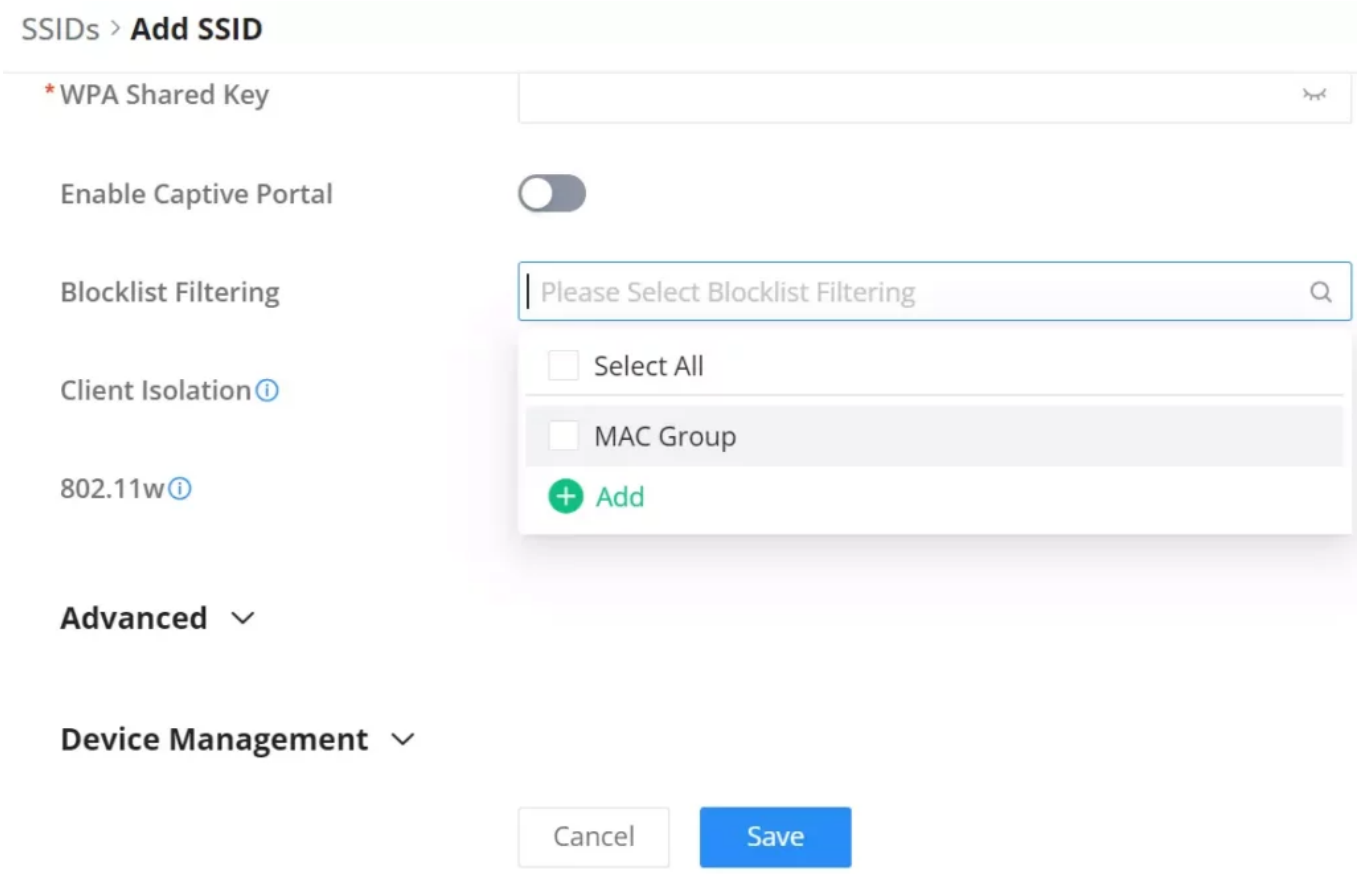


Add MAC address manually

After the MAC Group is created, to take effect, the user needs to apply it, for example, like the SSID:

Navigate to " **Web UI -> AP Management -> SSIDs**", either click on "**Add**" button to create new SSID or click on "**Edit**" icon to edit previously created SSID, scroll down to "**Access Security**" section then look for " **Blocklist Filtering**" option and finally select from the list the previously created MAC address, the user can select one or more, or click on "**Add**" at the bottom of the list to create new one.

Please refer to the figure below:



MAC Group SSID example

IP Address Group

The **IP Address Group** feature allows users to manage groups of IP addresses for applying policies such as security rules, NAT,or firewall settings. Both **IPv4** and **IPv6** addresses are supported. By grouping addresses, you can manage multiple addresses with ease, improving policy efficiency and reducing errors.

To configure IP Address Groups, follow these steps:
Navigate to **Profiles -> IP Address Group** from the main menu.

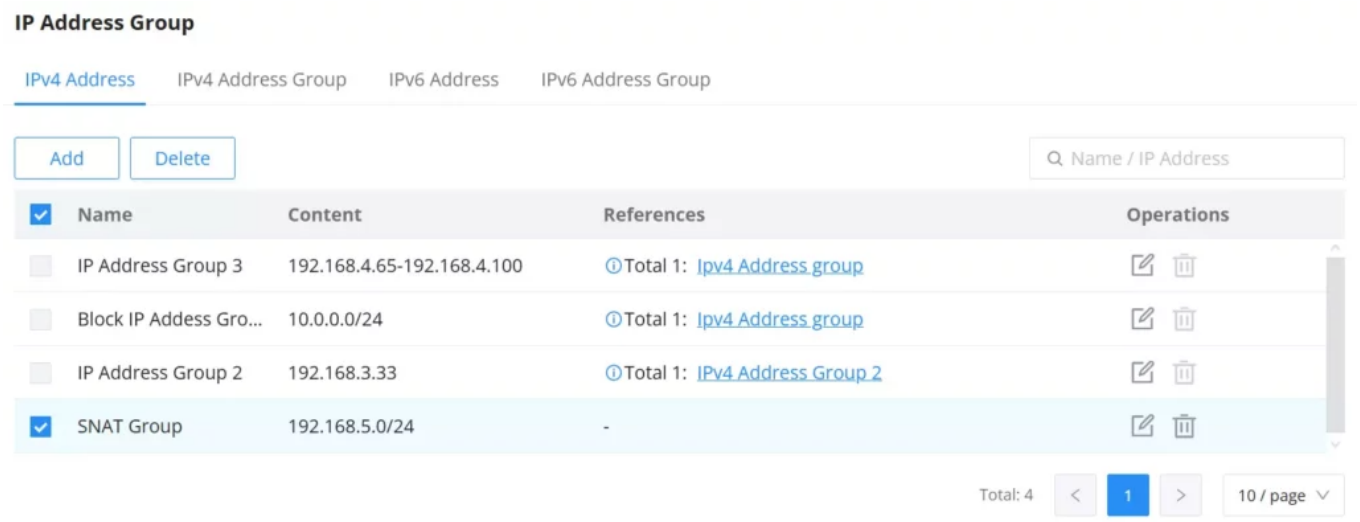
IPv4 Address

The **IPv4 Address** feature lets you add individual IPv4 addresses, subnets, or ranges for use in policies like NAT or firewall settings. Once addresses are added, you can group them for better management.

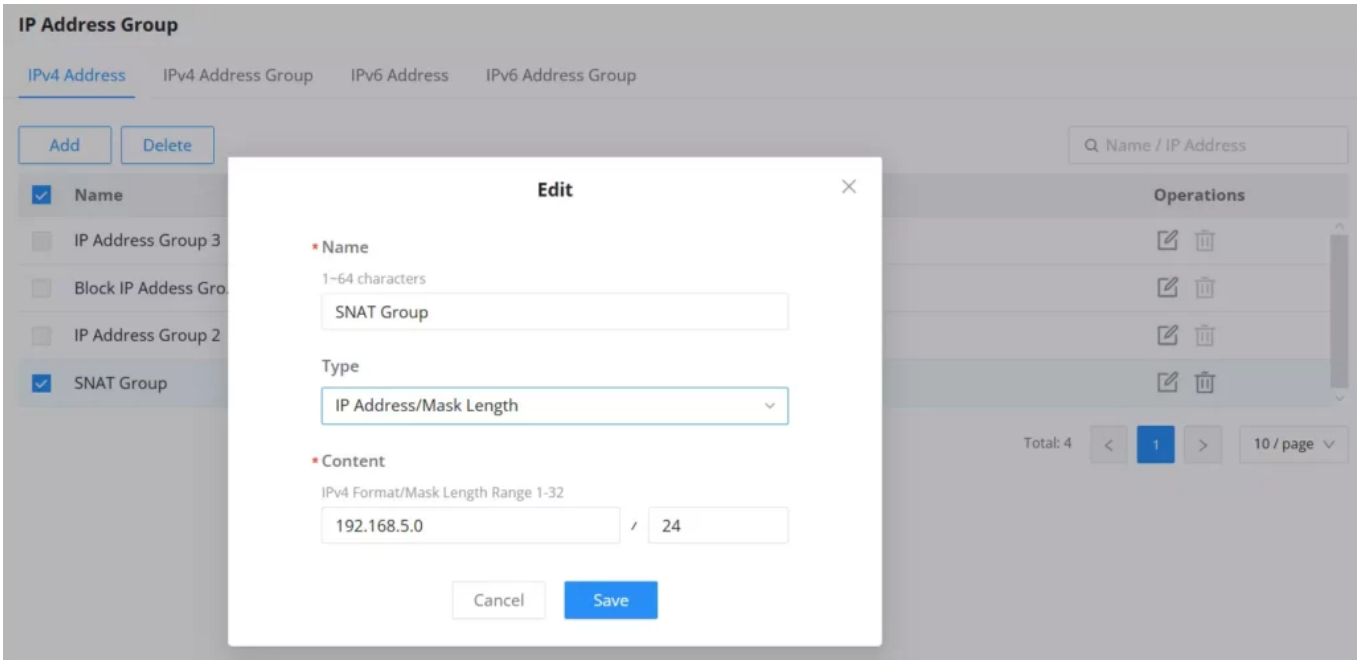
Steps to add an IPv4 Address:

1. Navigate to **Profiles -> IP Address Group -> IPv4 Address**.
2. Click **Add** to create a new IPv4 address.
3. Enter a **Name** for the address.
4. Select the **Type** from:

   - IP Address
   - IP Address/Mask Length
   - IP Address Range
5. Fill in the relevant details (e.g., IP address, subnet mask, or range).
6. Click **Save** to add the IPv4 address.



IP Address IPv4 Address



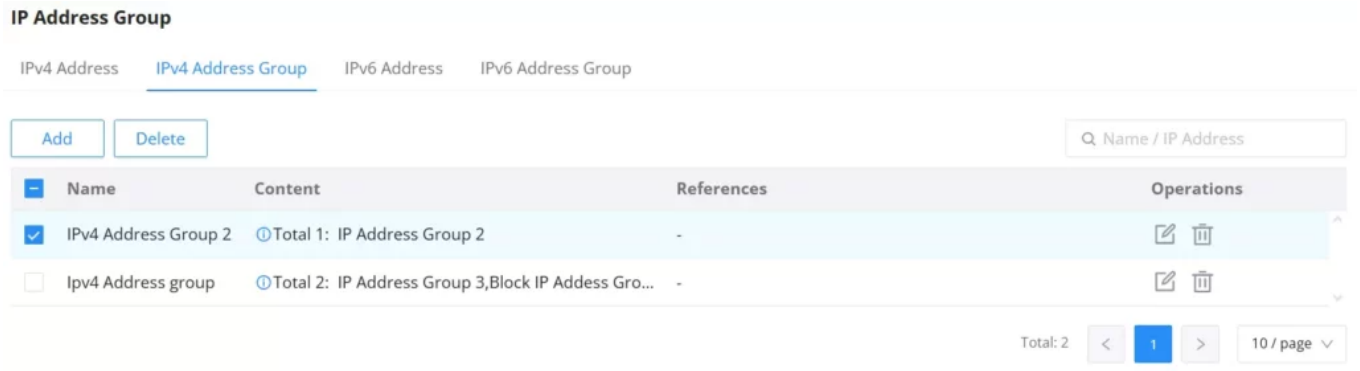
IP Address Add IPv4 Address

IPv4 Address Group

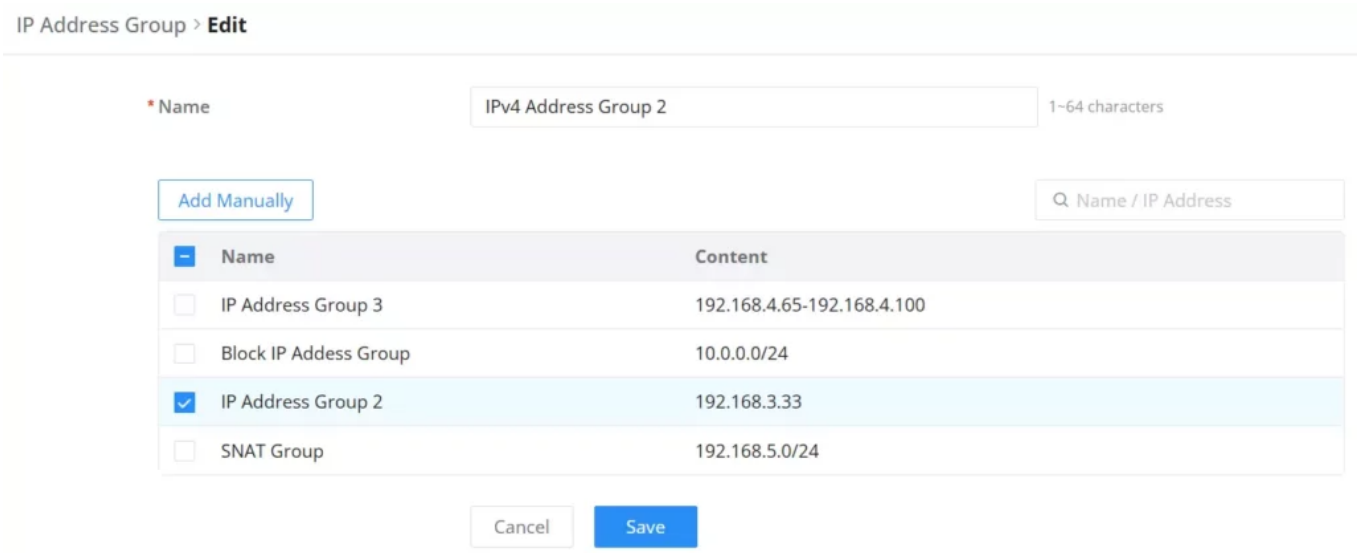
The **IPv4 Address Group** feature allows you to combine multiple IPv4 addresses into one group, simplifying the application of policies like SNAT or firewall rules.

Steps to create an IPv4 Address Group:

1. Navigate to **Profiles -> IP Address Group -> IPv4 Address Group**.
2. Click **Add** to create a new IPv4 group.
3. Enter a **Name** for the group.
4. Select the IPv4 addresses you wish to include in the group from the list.
5. Click **Save** to create the group.



IP Address Group IPv4 Address



IP Address Group Add IPv4 Address

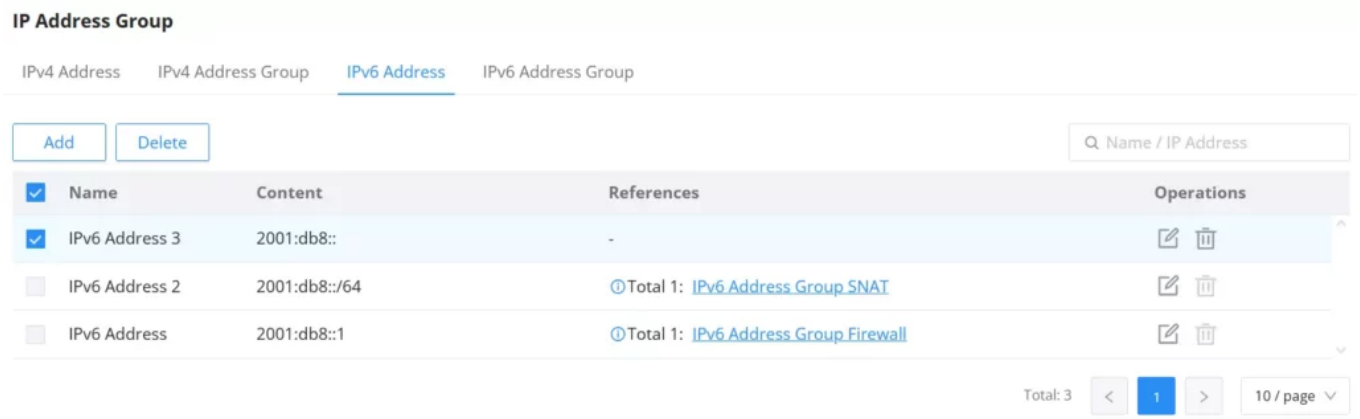
IPv6 Address

The **IPv6 Address** feature lets you add IPv6 addresses or networks, which can be used in settings such as firewall rules or NAT configurations.

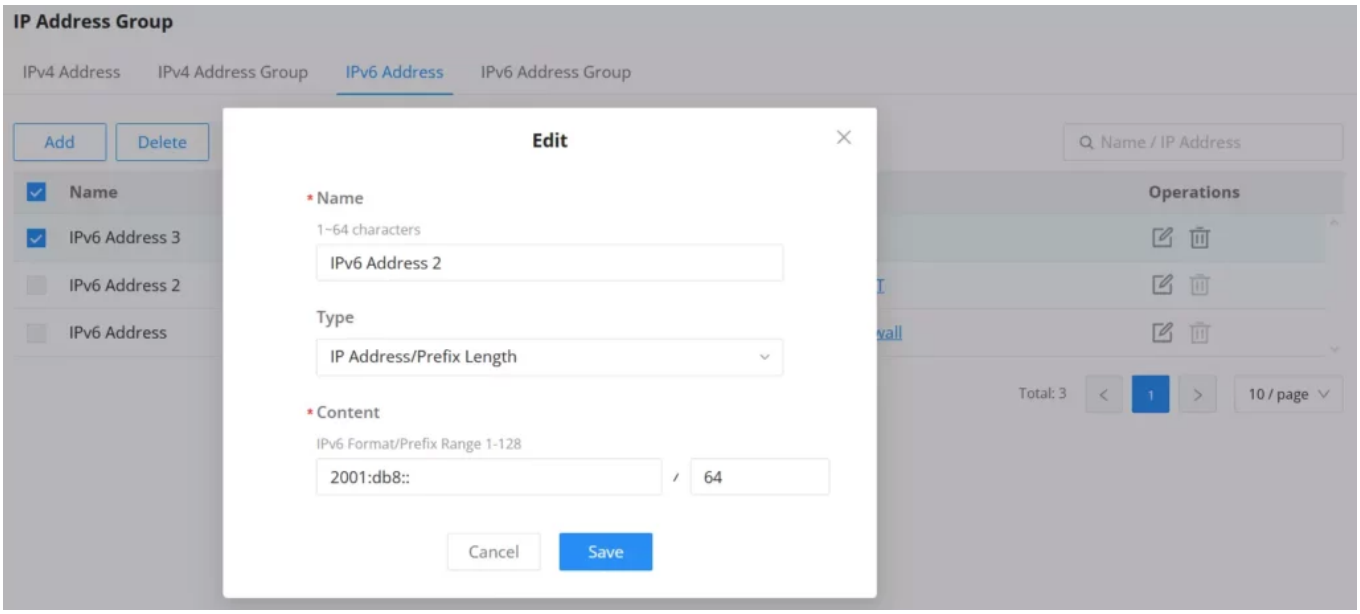
Steps to add an IPv6 Address:

1. Navigate to **Profiles -> IP Address Group -> IPv6 Address**.
2. Click **Add** to create a new IPv6 address.
3. Enter a **Name** for the address.
4. Select the **Type**:

   - IP Address
   - IP Address/Prefix Length
5. Fill in the relevant IPv6 address or prefix.
6. Click **Save** to add the IPv6 address.



IPv6 Address



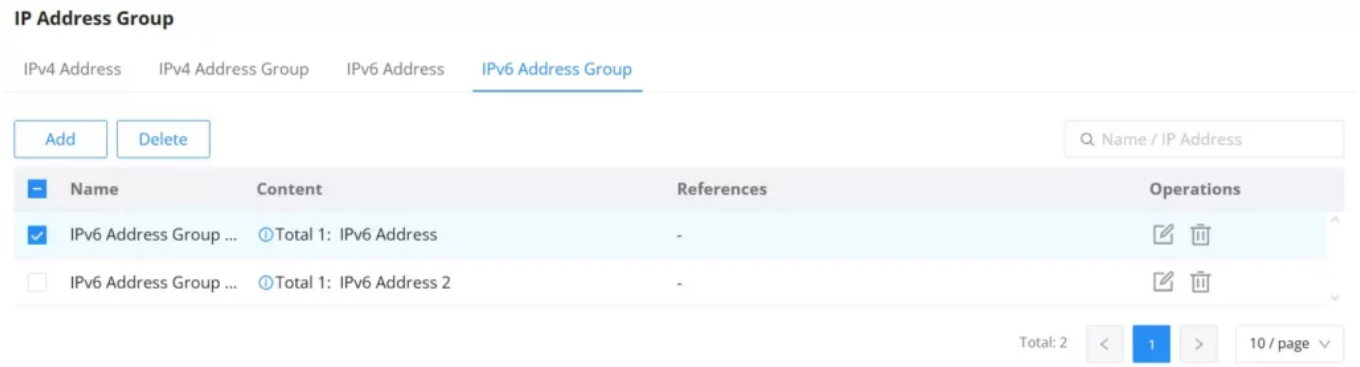
Add IPv6 Address

IPv6 Address Group

The **IPv6 Address Group** feature allows you to group multiple IPv6 addresses into one group. This makes it easier to apply policies to multiple addresses at once.

Steps to create an IPv6 Address Group:

1. Navigate to **Profiles -> IP Address Group -> IPv6 Address Group**.
2. Click **Add** to create a new IPv6 group.
3. Enter a **Name** for the group.
4. Select the IPv6 addresses to include from the list.
5. Click **Save** to create the group.



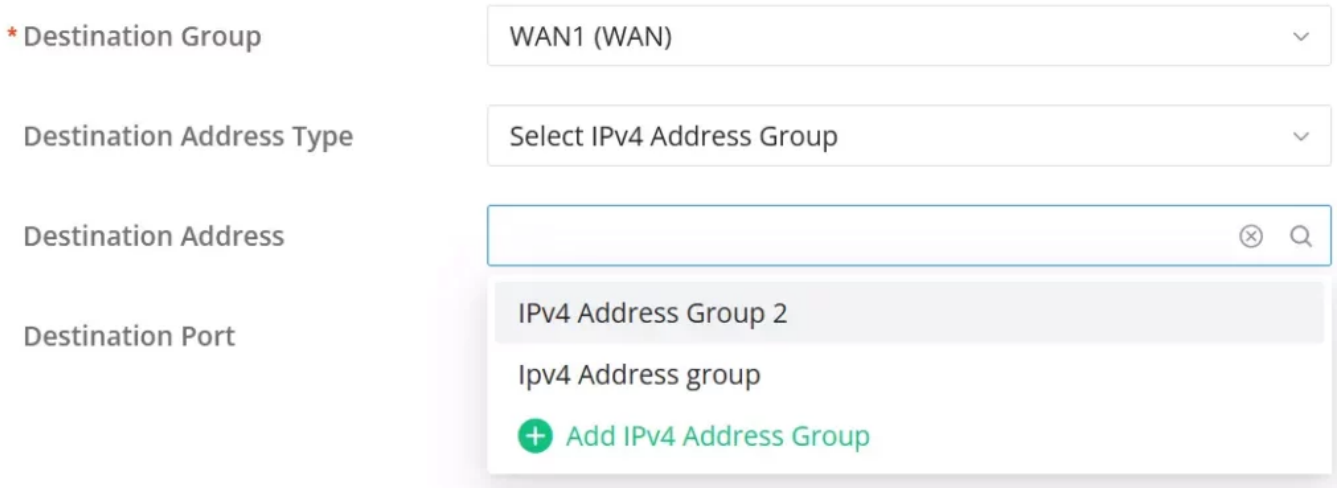
IPv6 Address Group

Add IPv6 Address Group

IP Address Group - Example

Here's an example of how to use an **IPv4 Address Group** in a **Source NAT (SNAT)** configuration:

1. Navigate to **Routing -> SNAT**.
2. Click **Add** to create a new SNAT rule.
3. Select the **Destination Group** as **WAN1 (WAN)**.
4. Under **Destination Address Type**, choose **Select IPv4 Address Group**.
5. Under **Destination Address**, select the desired **IPv4 Address Group** from the list.
6. Configure other fields such as **Destination Port** as needed.
7. Click **Save** to apply the rule.



IP Address Group

FQDN (Fully Qualified Domain Name)

The FQDN feature allows you to define domain names that can be applied in traffic rules, firewall policies, or other configurations. It can also be paired with specific IP addresses, making it easier to manage domains instead of individual IP addresses.

You can create individual **FQDN Addresses** or group multiple FQDN addresses into an **FQDN Address Group** for easier management and application in rules.

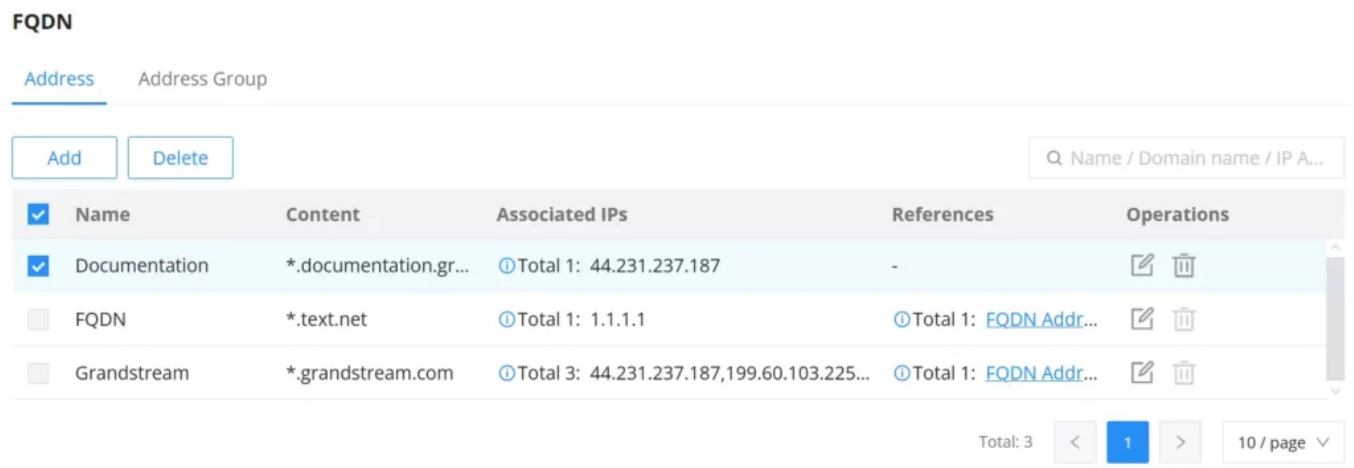
FQDN - Address

An FQDN Address is a domain name entry that can optionally be associated with up to eight IP addresses. This is useful for applying domain-based traffic filtering or rules.

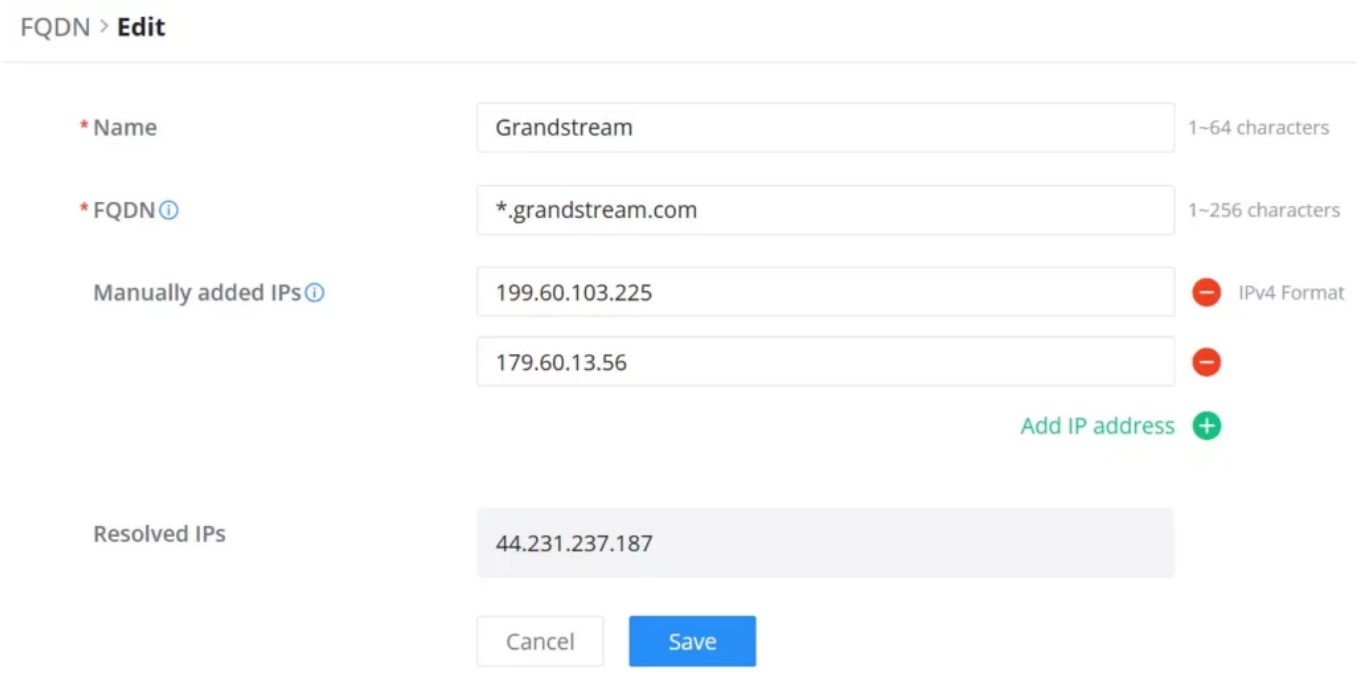
To create an FQDN Address:

1. **Navigate to**: **Profiles -> FQDN -> Address**
2. Enter the following:

   - **Name**: Name of the FQDN address (e.g., "Grandstream").
   - **FQDN**: Enter the domain (e.g., *.grandstream.com). Wildcards can be used to match subdomains.
   - **Manually added IPs** (optional): Add up to 8 IP addresses to be associated with the FQDN.
3. Click **Save** to add the FQDN entry.



FQDN



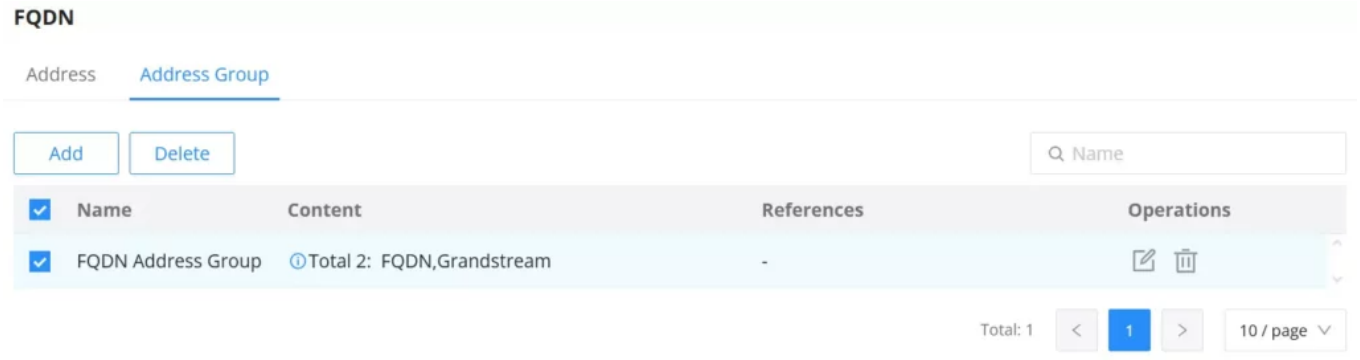
Add FQDN

FQDN - Address Group

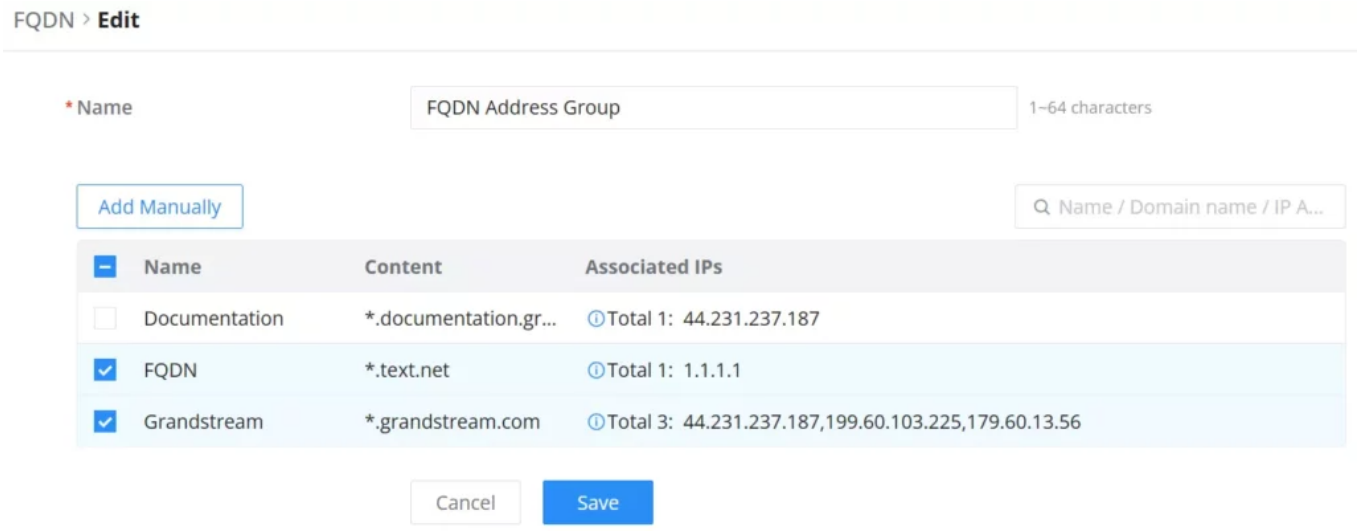
FQDN Address Groups allow you to group several FQDN addresses, which simplifies applying multiple FQDNs within traffic rules.

To create an FQDN Address Group:

1. **Navigate to**: **Profiles -> FQDN -> Address Group**
2. Provide a **Name** for the group.
3. Select the FQDN addresses to be included in the group.
4. Click **Save** to create the group.



FQDN address group



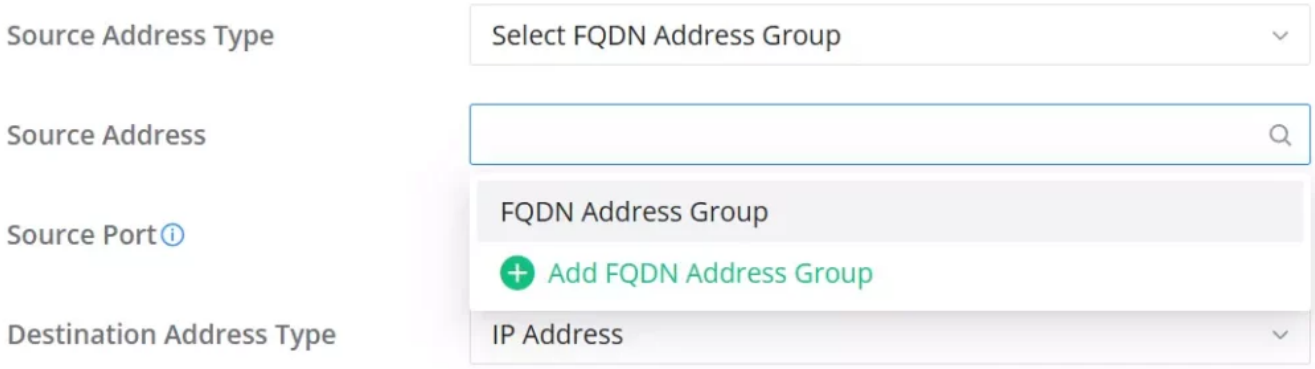
FQDN Add address group

FQDN - Example

Here is an example of applying an FQDN Address Group in a firewall rule. This will show how to use domain-based filtering within your network.

Example: Applying FQDN Address Group in a Traffic Rule

1. **Navigate to**: **Firewall -> Traffic Rules -> Add Inbound Rule**.
2. For **Source Address Type**, select **FQDN Address Group**.
3. Select the previously created FQDN Address Group (e.g., "FQDN Address Group").
4. Configure any other parameters as needed and click **Save**.



FQDN Example

RADIUS

RADIUS is a networking protocol that provides centralized authentication, authorization, and accounting for users or devices connecting to a network. In the GCC device, the RADIUS feature allows network administrators to integrate external RADIUS servers for handling network access.

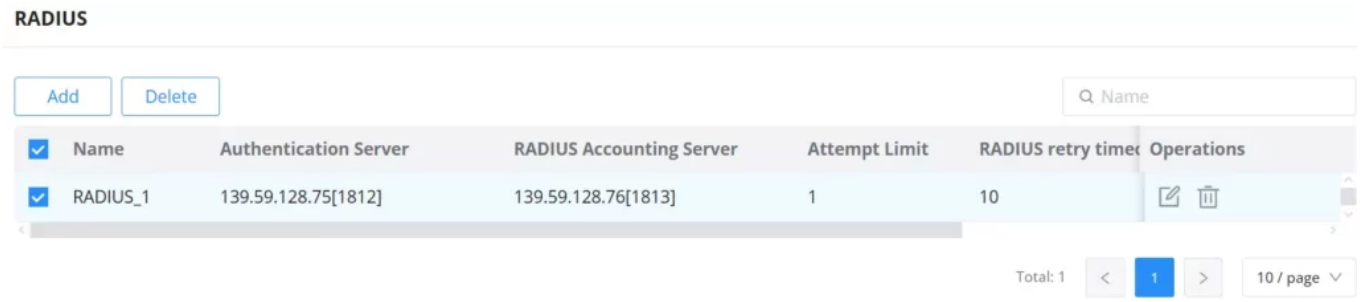
To create a RADIUS profile:

1. **Navigate to**: **Profiles** -> **RADIUS** -> **Add**.
2. **Enter the RADIUS server details**:

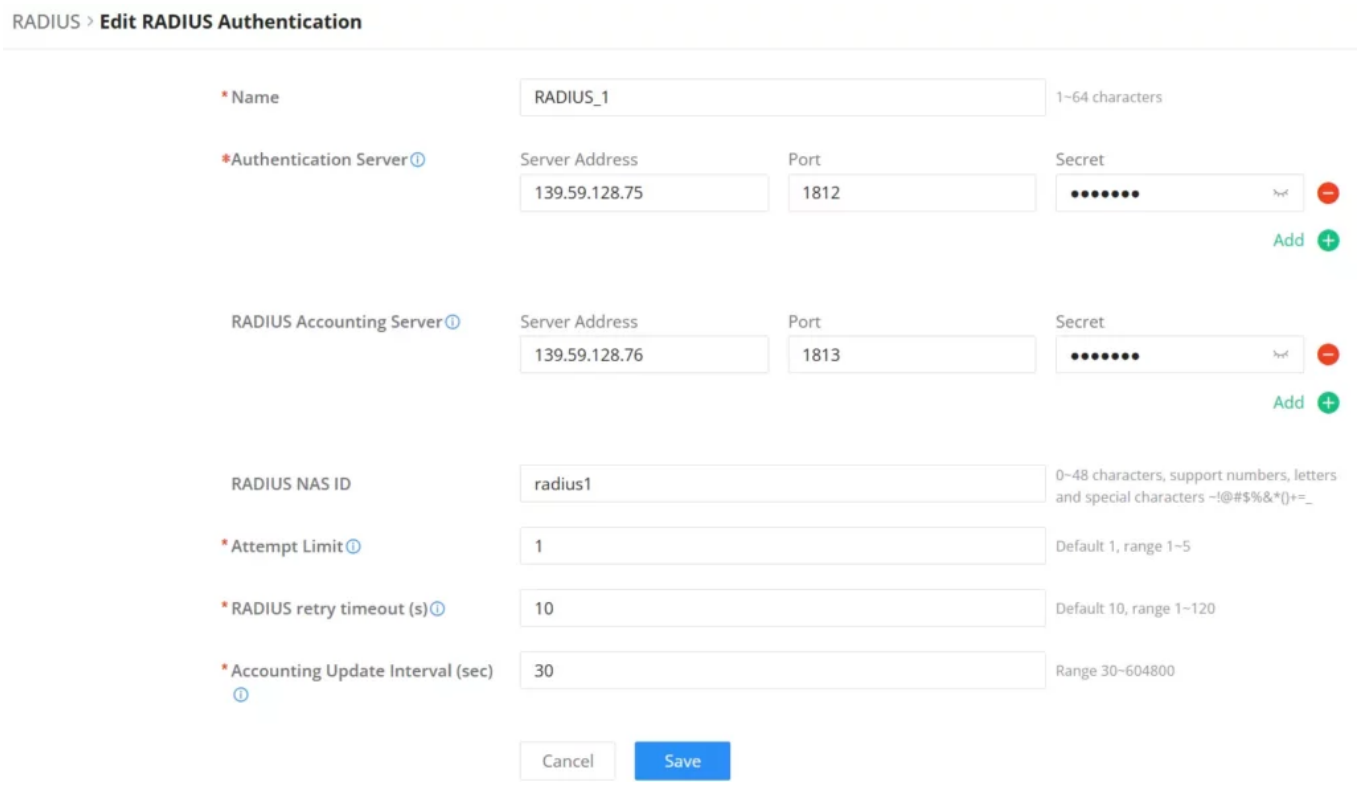
- **Authentication Server**: Enter the server address and port for authentication (default port is 1812).

- **RADIUS Accounting Server**: Enter the server address and port for accounting purposes (default port is 1813).
- **RADIUS NAS ID**: Input the NAS ID (Network Access Server ID).
- **Attempt Limit**: Specify the number of attempts before the server denies access.
- **RADIUS Retry Timeout**: Set the time to wait before retrying a connection to the server (in seconds).
- **Accounting Update Interval**: Set the interval at which accounting updates will be sent (in seconds).

3. **Save** the profile.



RADIUS



Add RADIUS

RADIUS - Example

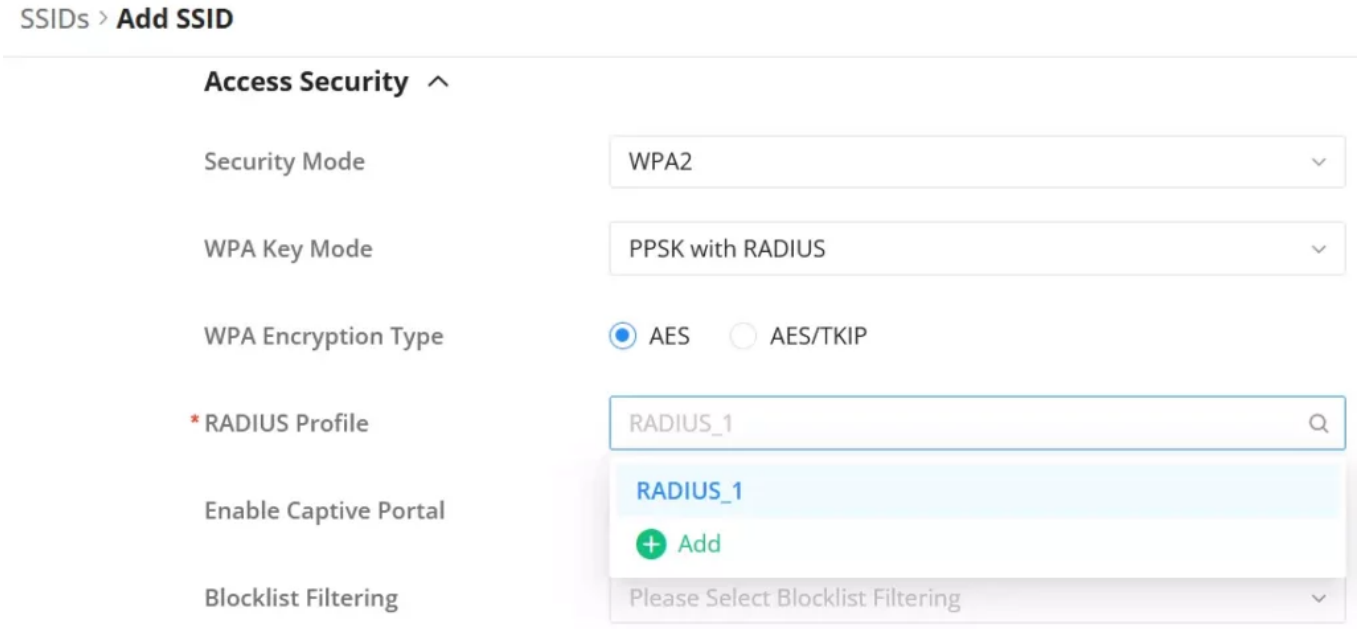
Applying the RADIUS Profile to a Wi-Fi SSID:

1. **Navigate to**: **AP Management** -> **SSIDs** -> **Add**.
2. In the **Access Security** section, configure the following:

- **Security Mode**: Select **WPA2**.
- **WPA Key Mode**: Select **PPSK with RADIUS** or another option based on the required encryption method.

- **RADIUS Profile**: Select the previously created **RADIUS Profile** from the dropdown list.

3. **Save** the settings.

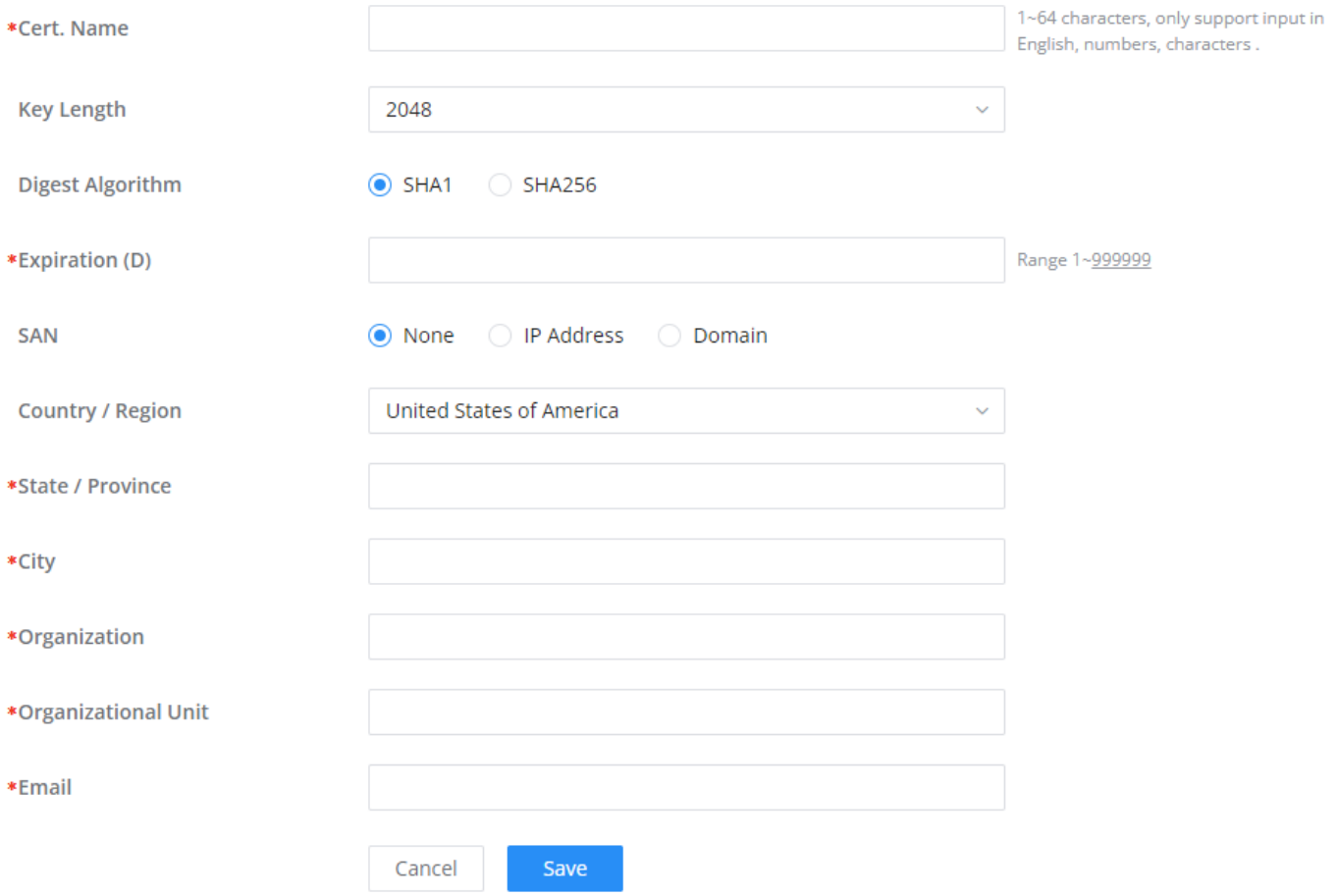


RADIUS Example

Certificates

CA Certificates

In this section, the user can create a CA certificate. This certificate will authenticate the user when connected to the VPN server created on the router. This authentication will ensure that no identity is being usurped and that the data exchanged remains confidential. To create a certificate, please access the web GUI of the router and go to **Profiles -> Certificates -> CA Certificates**, then click "Add" and fill in the necessary information.



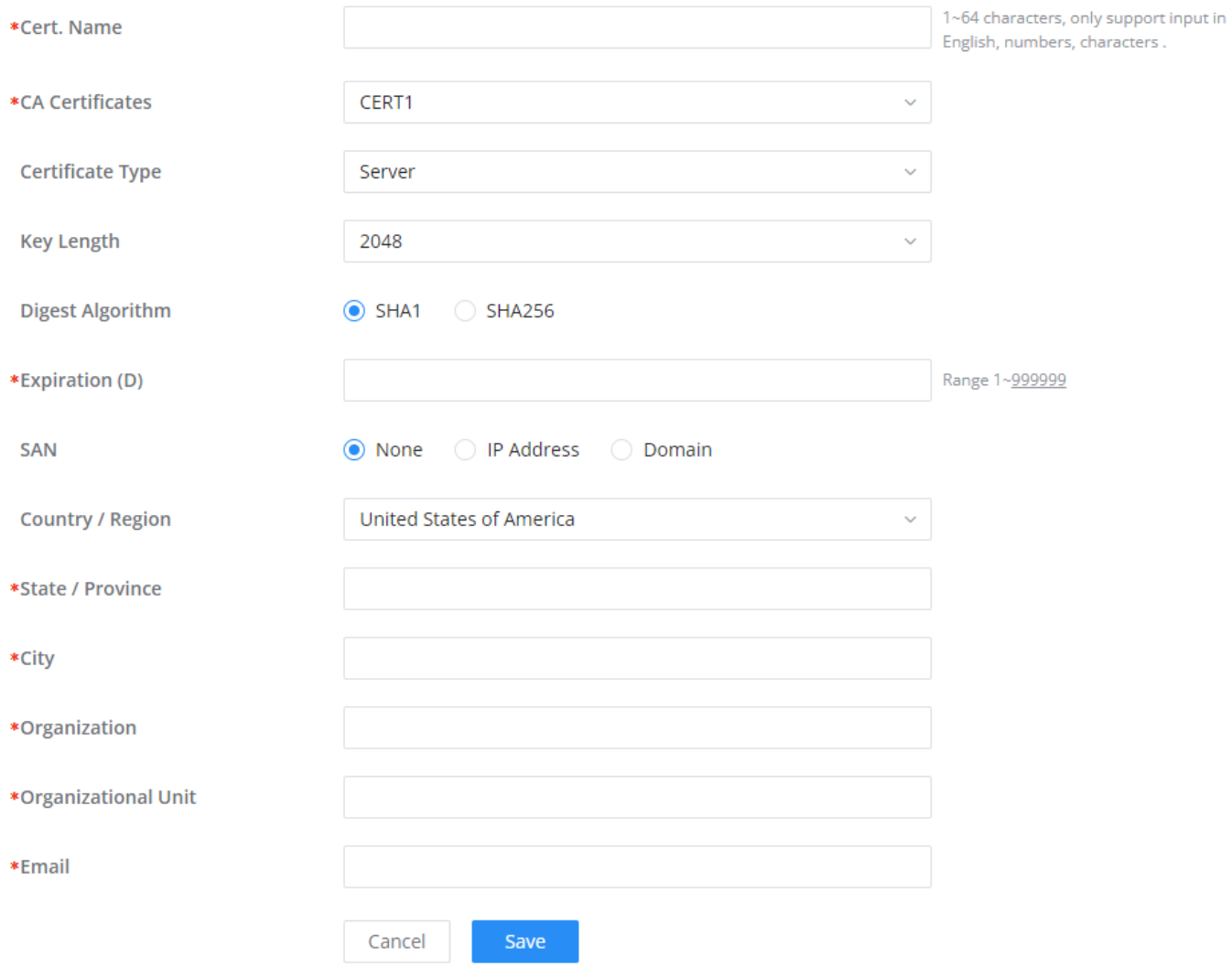
Add CA Certificate

Cert. Name	Enter the Certificate name for the CA.Note: It could be any name to identify this certificate. Example: "CATest".
Key Length	Choose the key length for generating the CA certificate.The following values are available: 512: 512-bit keys are not secure and it's better to avoid this option. 1024: 1024-bit keys are no longer sufficient to protect against attacks. 2048: 2048-bit keys are a good minimum. (Recommended). 4096: 4096-bit keys are accepted by nearly all RSA systems. Using 4096-bit keys will dramatically increase generation time, TLS handshake delays, and CPU usage for TLS operations.
Digest Algorithm	Choose the digest algorithm: SHA1: This digest algorithm provides a 160-bit fingerprint output based on arbitrary-length input. SHA256: This digest algorithm generates an almost unique, fixed-size 256 bit hash. Note: Hash is a one-way function, it cannot be decrypted back.
Expiration (D)	Enter the validity date for the CA certificate in days.The valid range is 1~999999..
Country / Region	Select a country code from the dropdown list.Example: "United Stated of America".
State / Province	Enter a state name or province.Example: "Casablanca".
City	Enter a city name.Example: "SanBern".
Organization	Enter the organization's name.Example: "GS".
Organizational Unit	This field is the name of the department or organization unit making the request.Example: "GS Sales".
Email	Enter an email address.Example: "EMEAregion@grandstream.com"

Add CA Certificate

Certificate

In this section, the user can create a server or a client certificate. To create a certificate please access the web UI of the router, then navigate to **Profiles -> Certificates -> Add Certificate**, click "Add", then enter the necessary information regarding the certificate.



Add Certificate

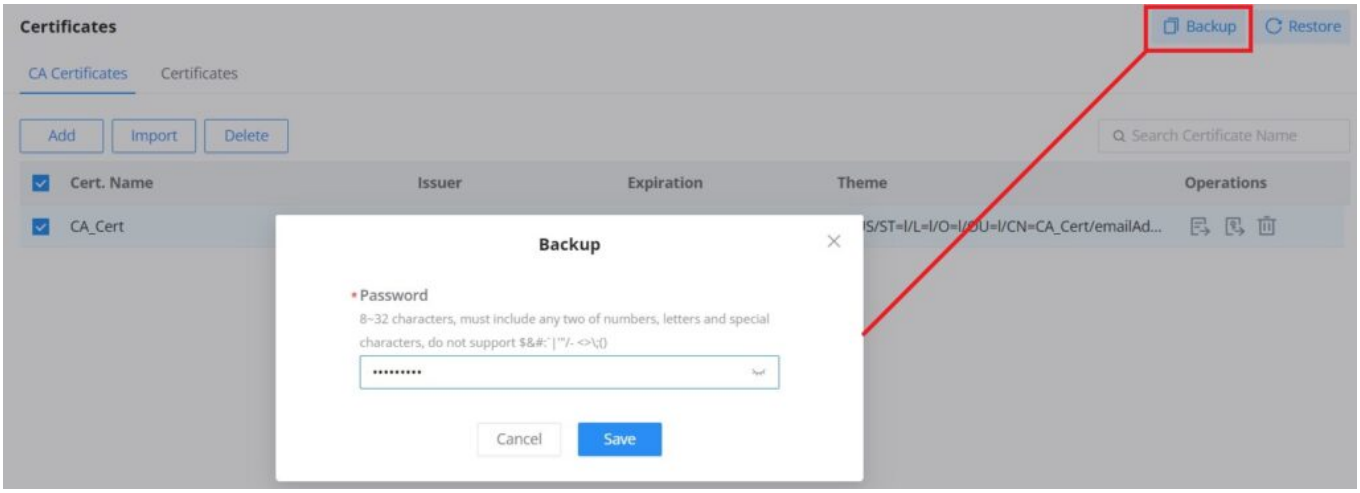
Cert. Name	Enter the certificate's name.
Key Length	Choose the key length for generating the CA certificate.The following values are available: 512: 512-bit keys are not secure and it's better to avoid this option. 1024: 1024-bit keys are no longer sufficient to protect against attacks. 2048: 2048-bit keys are a good minimum. (Recommended). 4096: 4096-bit keys are accepted by nearly all RSA systems. Using 4096-bit keys will dramatically increase generation time, TLS handshake delays, and CPU usage for TLS operations.
Digest Algorithm	Select the digest algorithm. SHA1: This digest algorithm provides a 160-bit fingerprint output based on arbitrary-length input. SHA256: This digest algorithm generates an almost unique, fixed-size 256 bit hash. Note: Hash is a one-way function, it cannot be decrypted back.
Expiration (D)	Select the duration of validity of the certificate. The number entered represents the days that have to elapse before the certificate is considered as expired. The valid range is 1 - 999999.
SAN	Enter the address IP or the domain name of the SAN (Subject Alternate Name).
Country / Region	Select a country from the dropdown list of countries. Example: "United States of America".
State / Province	Enter a state name or a province. Example: California

City	Enter a city name. Example: "San Diego"
Organization	Enter the organization's name. Example: "GS".
Organization Unit	This field is the name of the department or organization unit making the request. Example: "GS Sales".
Email	Enter an email address. Example: "EMEAregion@grandstream.com"

Add Certificate

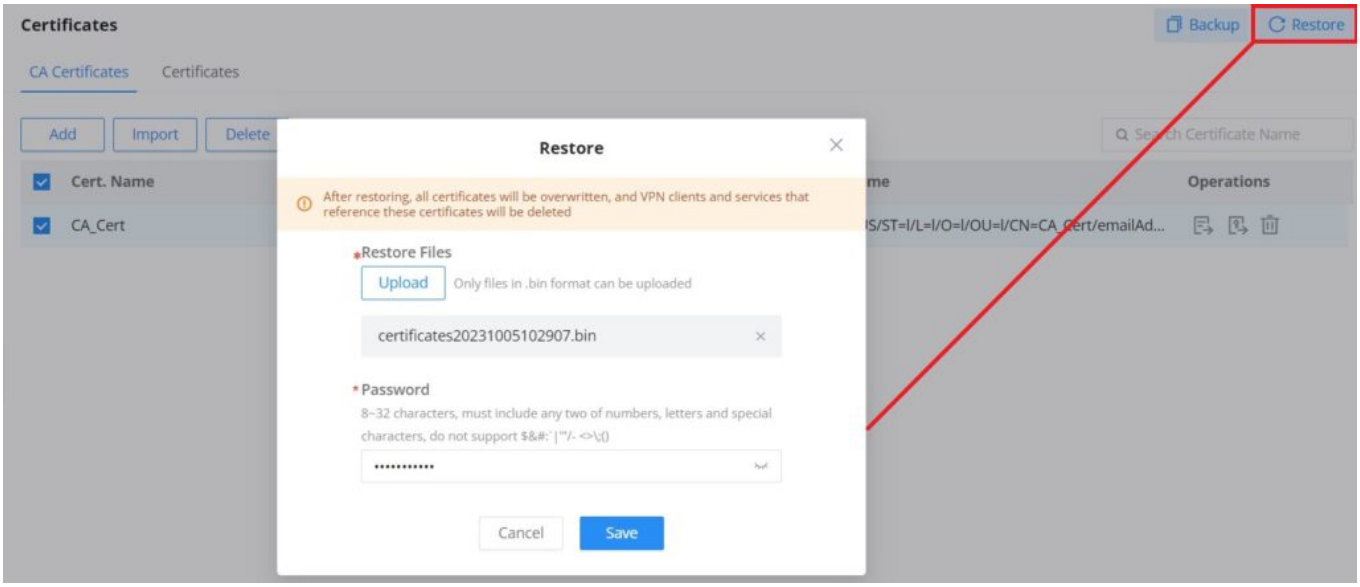
Certificates Backup and Restore

To backup the created certificates, first select all the desired certificates, then click on "**Backup**" button and enter a password to protect it as shown below:



Certificate Backup

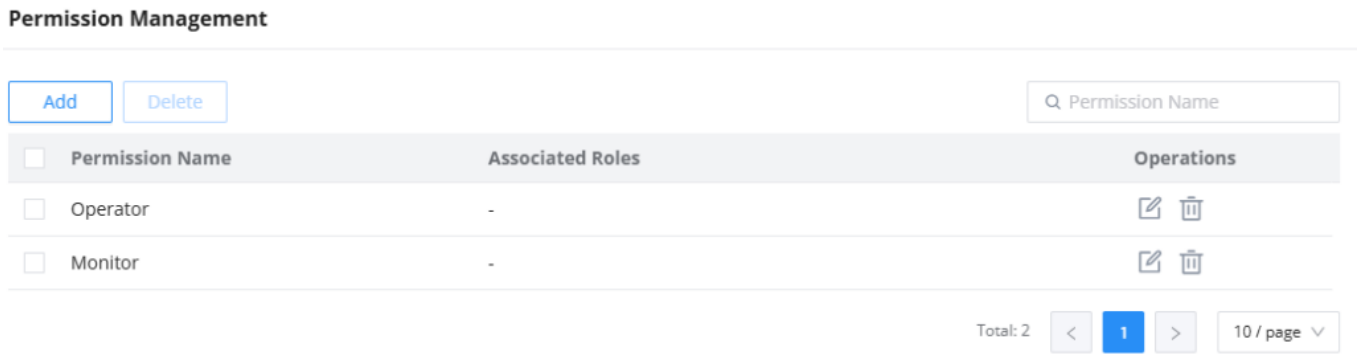
To restore a certificate, click the "**Restore**" button, then upload the file and enter the password.



Certificate Restore

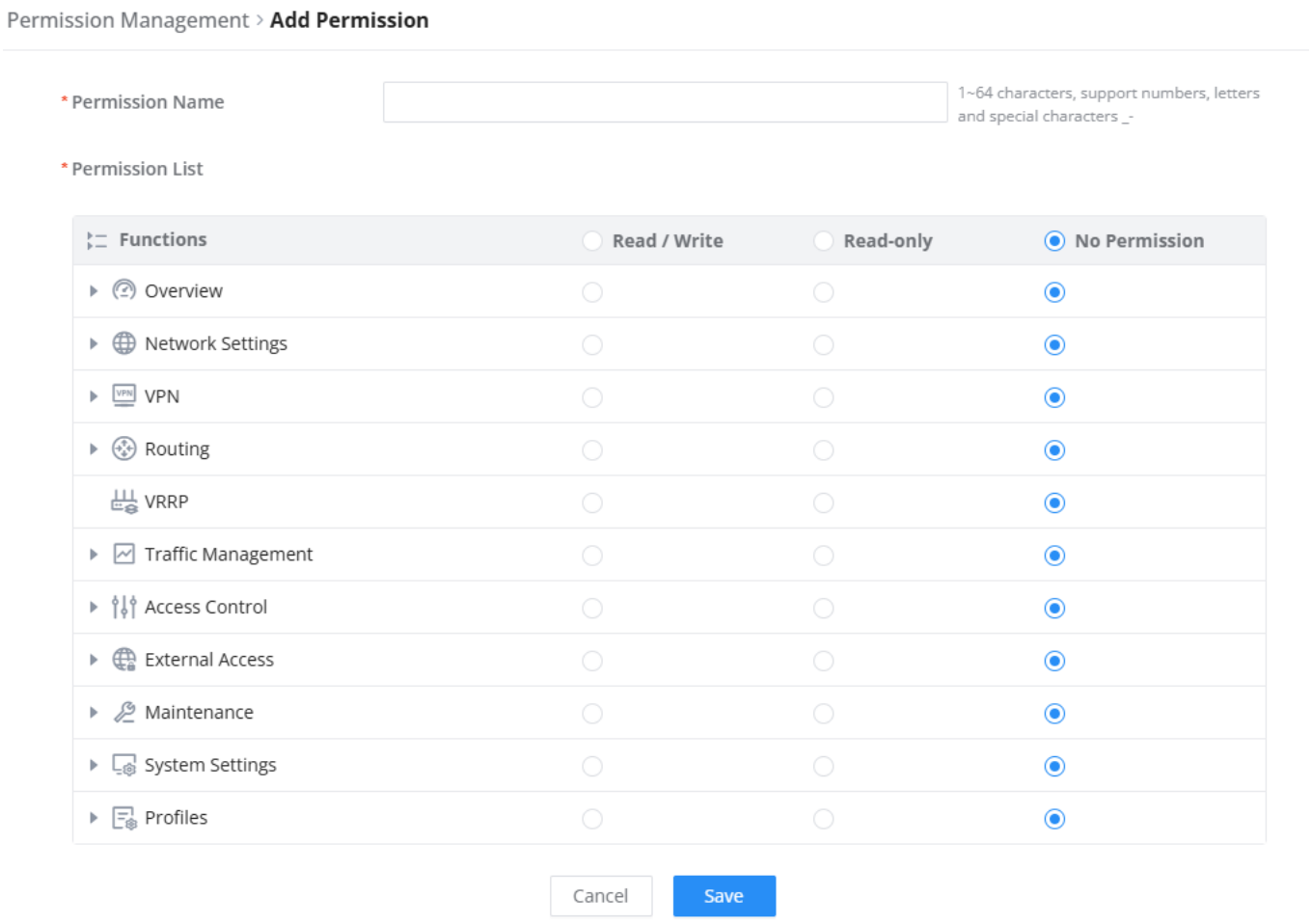
PERMISSION MANAGEMENT

Permission Management allows the administrator to create multiple roles with different permissions, it allows creating roles with permissions of reading, or reading and writing privileges which allow monitoring, or monitoring and changing the settings on the Networking module, respectively.



Permission Management

Click on button to add a new permission category. Enter the permission name, then select the functions, you can select to allow read, or read and write permissions. Click "Save" once done.



Add Permission

CHANGE LOG

This section documents significant changes from previous versions of user manuals for GCC602x. Only major new features of the networking module or major document updates are listed here. Minor updates for corrections or editing are not documented here.

Firmware version 1.0.7.69 (PBX version 1.0.27.94)

- Added Permission Management section. [PERMISSION MANAGEMENT]

- Ports 25 - 27 can now be configured as WAN ports [WAN]

Firmware version 1.0.7.59 (PBX version 1.0.27.94)

- Added support for Bridge mode [Bonjour Gateway]

Firmware version 1.0.7.48 (PBX version 1.0.27.90)

- Added support for GDMS new IPsec option "Add Router LAN address", which will allow the router to use its own LAN address to configure local subnet for VPN.
- Added support for [USB 4G/5G dongle].

Firmware version 1.0.7.46 (PBX version 1.0.27.90)

- No major changes.

Firmware version 1.0.7.44 (PBX version 1.0.27.89)

- Added VLAN option under Static IP. [Static IP Binding]
- Updated default MGMT port network segment to 10.252.252.252/24. [MGMT]
- Added ZeroTier option to VPN Setup Wizard. [Setup Wizard]
- Added ZeroTier configuration interface under VPN. [ZeroTier VPN]
- Added RADIUS Authentication mode and Certificate + RADIUS Authentication to OpenVPN server. [OpenVPN(R) Server]
- Updated QoS bandwidth limits for Maximum Uplink/Downlink Bandwidth to 1-10240 Mbps. [QoS]
- Updated Traffic Management - Bandwidth Limit for Maximum Uplink/Downlink Bandwidth to 1-10240 Mbps. [Bandwidth Limit]
- Added "Custom" option to DDNS service provider list, allowing manual configuration of third-party providers. [DDNS]
- Added support for microSD storage devices. [File Sharing]

Firmware version 1.0.7.32

- This is the initial version.

Return to the main page