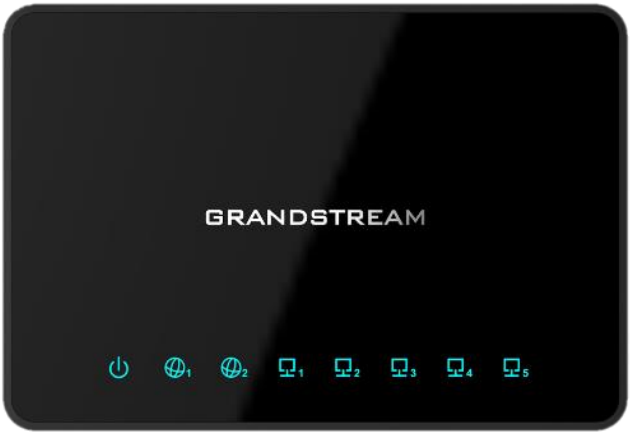
Grandstream Networks, Inc.

GWN7000

Enterprise Multi-WAN Gigabit VPN Router

User Manual



COPYRIGHT

The latest electronic version of this guide is available for download here:
http://www.grandstream.com/support

OPEN SOURCE LICENSES

GWN7000 firmware contains third-party open source software. Grandstream Open source licenses can be downloaded from Grandstream web site from here

CAUTION

Changes or modifications to this product not expressly approved by Grandstream, or operation of this product in any way other than as detailed by this guide, could void your manufacturer warranty.

WARNING

Please do not use a different power adaptor with devices as it may cause damage to the products and void the manufacturer warranty.

Table of Contents

Table of Tables

Table of Figures

DOCUMENT PURPOSE

This document describes how to configure the GWN7000 to manage wired and wireless networks via an intuitive WebGUI. The intended audiences of this document are network administrators. Please visit http://www.grandstream.com/support to download the latest “GWN7000 User Manual”.

This guide covers following topics:

CHANGE LOG

This section documents significant changes from previous versions of the GWN7000 user manuals. Only major new features or major document updates are listed here. Minor updates for corrections or editing are not documented here.

Firmware Version 1.0.2.71

- This is the initial version.

WELCOME

Thank you for purchasing Grandstream GWN7000 Enterprise Multi-WAN Gigabit VPN Router.

The GWN7000 is a powerful enterprise-grade multi-WAN Gigabit VPN router. Ideal for the enterprise, small-to-medium business, retail, education, hospitality and medical markets, the GWN7000 supports comprehensive Wi-Fi and VPN solutions that can be shared across one or many different physical locations. It features high-performance routing and switching power and a hardware-accelerated VPN client/server for secure inter-office connectivity. To maximize network reliability, the GWN7000 supports traffic load balancing and failover. The GWN7000 features an integrated controller and automated provisioning master that can setup and manage up to 300+ in-network GWN series Wi-Fi Access Points. This can be easily operated through the product's intuitive web browser user interface, which also offers a central panel to monitor and control the entire network.

Caution:

Changes or modifications to this product not expressly approved by Grandstream, or operation of this product in any way other than as detailed by this User Manual, could void your manufacturer warranty.

Warning:

Please do not use a different power adaptor with the GWN7000 as it may cause damage to the products and void the manufacturer warranty.

PRODUCT OVERVIEW

Technical Specifications

Table 1: GWN7000 Technical Specifications

Network Interfaces	• 2 x autosensing 10/100/1000 WAN Ports • 1 x autosensing 10/100/1000 configurable as LAN or VoIP port • 4 x autosensing 10/100/1000 LAN Ports
WAN	• DHCP • Static IP • PPPoE • Load balance & failover • Rule based routing
LAN	• DHCP server • DNS Cache • Multiple zones • VLAN
Auxiliary Ports	• 2 x USB 3.0 ports • 1 x Reset Pinhole
Routing Performance	Up to 1 million packets/second with 64-byte packet size
USB	• 3G/4G/LTE as WAN • Printer sharing • File sharing
Network Protocols	• IPv4, IPv6, 802.1Q, 802.1p
VPN	• Protocols: PPTP, L2TP/IPSec, OpenVPN® • Client, Server or pass through
LED	8 green-color LEDs for device tracking and status indication
Mounting	Indoor wall mount, Desktop
QoS	VLAN, TOS, supports multiple traffic classes, filter by port, IP address, DSCP, and policing
Firewall	NAT, DMZ, Port Forwarding, SPI, UPnP
Auto Provisioning Capability	Embedded provisioning controller to manage up to 300+ GWN series Wi-Fi APs
Management	Web, CLI
Power	• 802.3at PoE • Included Power Supply: 12V/2A

	• Max power consumption: 16W
Environmental	• Operation: 0°C to 50°C • Storage: -10°C to 60°C • Humidity: 10% to 90% Non-condensing
Physical	Unit Dimensions: 200 x 136 x 37mm; Unit Weight: 570g Entire Package Dimensions: 324 x 163.5 x 54mm; Entire Package Weight: 930g
Package Content	• GWN7000 Enterprise Router • 12V/2A Power Adapter • Quick Installation Guide • GPL License
Compliance	FCC, CE, RCM, IC

INSTALLATION

Before deploying and configuring the GWN7000, the device needs to be properly powered up and connected to the network. This section describes detailed information on installation, connection and warranty policy of the GWN7000.

Equipment Packaging

Table 2: GWN7000 Equipment Packaging

Main Case	Yes (1)
Power adaptor	Yes (1)
Quick Installation Guide	Yes (1)
GPL License	Yes (1)

Connect your GWN7000

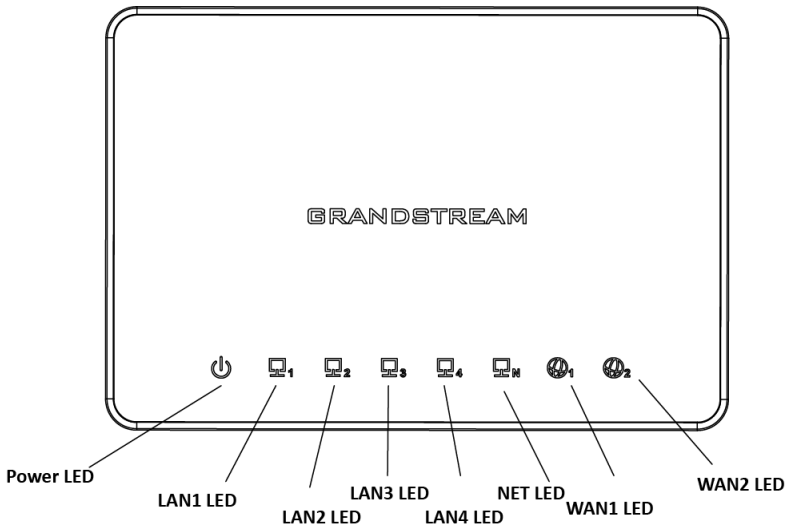


Figure 1: GWN7000 Front View

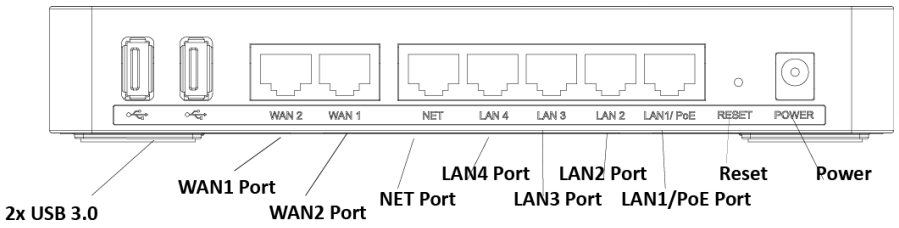


Figure 2: GWN7000 Back View

To set up the GWN7000, follow the steps below:

1. Connect one end of an RJ-45 Ethernet cable into the WAN1 or/and WAN2 port(s) of the GWN7000.
2. Connect the other end of the Ethernet cable(s) into a DSL modem or router(s).
3. Connect the 12V DC power adapter into the power jack on the back of the GWN7000. Insert the main plug of the power adapter into a surge-protected power outlet.
4. Wait for the GWN7000 to boot up and connect to internet/network. In the front of the GWN7000 the Power LED will be in solid green, and the WAN LED will flash in green.
5. Connect one of the LAN ports to your computer, the associated LED ports will flash in green.
6. (Optional) Connect LAN ports to your GWN76xx access points or/and other devices, the associated LED ports will flash in green.

Safety Compliances

The GWN7000 Enterprise Router complies with FCC/CE and various safety standards. The GWN7000 power adapter is compliant with the UL standard. Use the universal power adapter provided with the GWN7000 package only. The manufacturer's warranty does not cover damages to the device caused by unsupported power adapters.

Warranty

If the GWN7000 Enterprise Router was purchased from a reseller, please contact the company where the device was purchased for replacement, repair or refund. If the device was purchased directly from Grandstream, contact our Technical Support Team for a RMA (Return Materials Authorization) number before the product is returned. Grandstream reserves the right to remedy warranty policy without prior notification.

GETTING STARTED

The GWN7000 Enterprise Router provides an intuitive web GUI configuration interface for easy management to give users access to all the configurations and options for the GWN7000's setup.

This section provides step-by-step instructions on how to read LED indicators and use Web GUI interface of the GWN7000.

LED Indicators

The front panel of the GWN7000 has LED indicators for power and interfaces activities, the table below describes the LED indicators status.

Table 3: LED Indicators

LED	Status	Indication
POWER	OFF	GWN7000 is powered off or abnormal power supply.
	Solid green	GWN7000 is powered on correctly.
WAN (1,2)	Flashing green	GWN7000 is connected as a client to another network and data is transferring.
	Solid green	GWN7000 is connected as a client to another network and there is no activity.
LAN (1,2,3,4,5)	Flashing green	A device is connected to the corresponding LAN port and data is transferring.
	Solid green	A device is connected to the corresponding LAN port and there is no activity.

Use the WEB GUI

Access WEB GUI

The GWN7000 embedded Web server responds to HTTPS GET/POST requests. Embedded HTML pages allow users to configure the device through a Web browser such as Microsoft IE, Mozilla Firefox, Google Chrome.

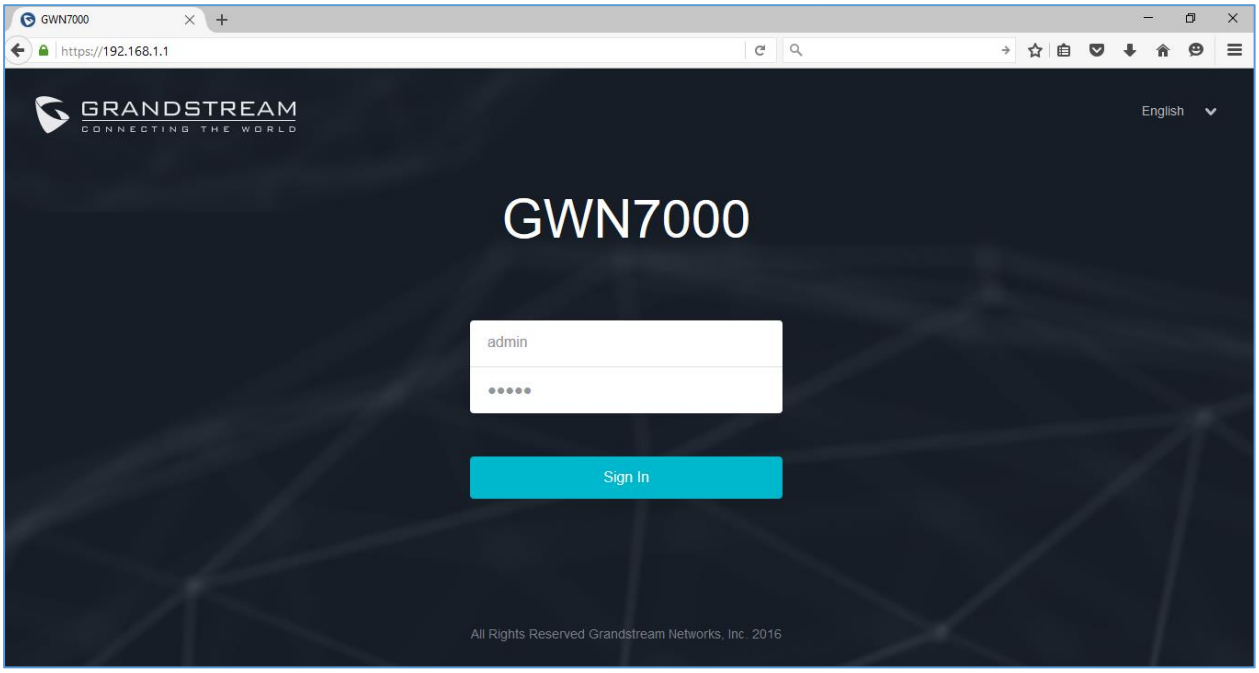


Figure 3: GWN7000 Web GUI Login Page

To access the Web GUI:

1. Connect a computer to a LAN Port of the GWN7000.
2. Ensure the device is properly powered up, and the Power, LAN port LEDs light up in green.
3. Open a Web browser on the computer and enter the web GUI URL in the following format: https://192.168.1.1 (Default IP address).
4. Enter the administrator's login and password to access the Web Configuration Menu. The default administrator's username and password are "admin" and "admin".

   Note: At first boot or after factory reset, users will be asked to change the default administrator and user passwords before accessing GWN7000 web interface.
   The password field is case sensitive with a maximum length of 32 characters. Using strong password including letters, digits and special characters is recommended for security purposes.

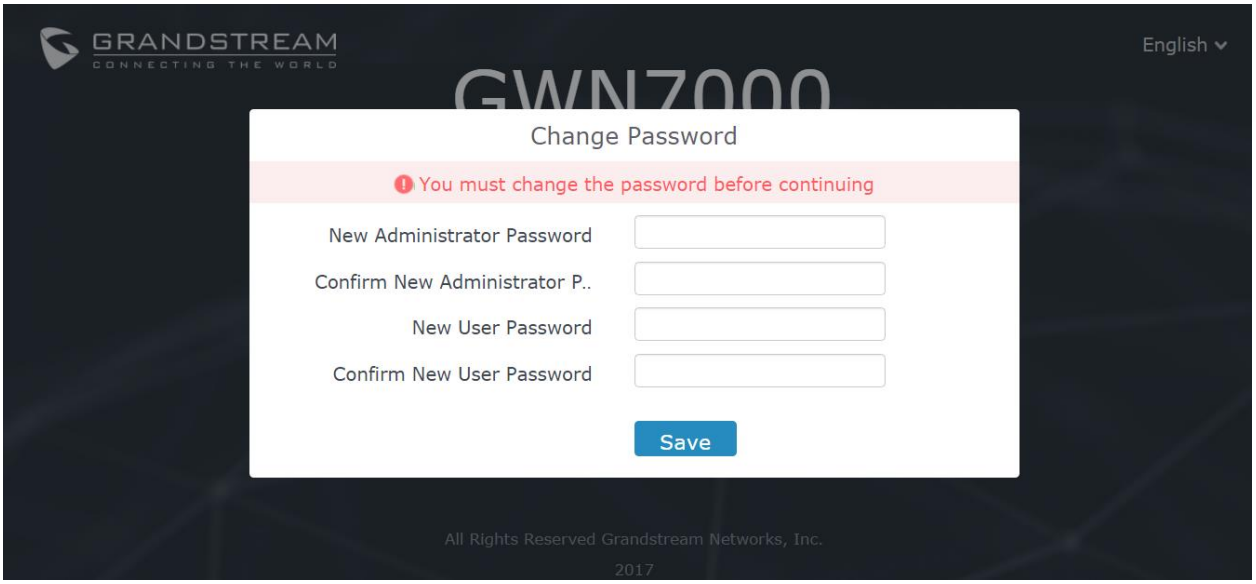


Figure 4: Change Password on first boot

At first login, a Setup Wizard tool will pop up to help going through the configuration setup, or exit to configure manually. Setup Wizard can be accessed anytime by clicking on  while on the web interface.

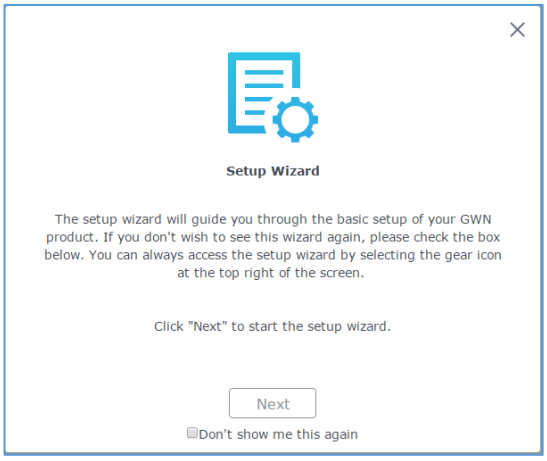


Figure 5: Setup Wizard

WEB GUI Languages

Currently the GWN7000 series web GUI supports ***English*** and ***Simplified Chinese.***

To change default language, select the displayed language at the upper right of the web GUI either before or after logging in.

Figure 6: GWN7000 Web GUI Language

Figure 7: GWN7000 Web GUI Language

WEB GUI Configuration

GWN7000 web GUI includes 8 main sections to configure and manage the router and check connection status.

- **Overview:** Provides an overall view of the GWN7000's information presented in a Dashboard style for easy monitoring.
- **Router:** Displays device's status and used to configure ports settings such as IP configuration for WAN ports, load balancing, failover, static routes, port mirroring, QoS and DDNS.
- **Access Points:** To add, pair and manage discovered access points.
- **Clients**: Shows and manages the list of the clients connected to LAN ports of the GWN7000 and wireless clients connected via GWN76xx access points.
- **VPN:** Configures OpenVPN® Client/Server, PPTP and L2TP/IPSec client tunnels.
- **Firewall:** Basic and advanced Firewall configuration to securely manage router's incoming/outgoing traffic.
- **Network Group:** To add and manage wireless network groups using paired access points via VLANs.
- **System Settings:** For Maintenance and debugging features, as well as generating certificates and file sharing.

Overview Page

Overview is the first page shown after successful login to the GWN7000's Web Interface. It provides an overall view of the GWN7000's information presented in a Dashboard style for easy monitoring.

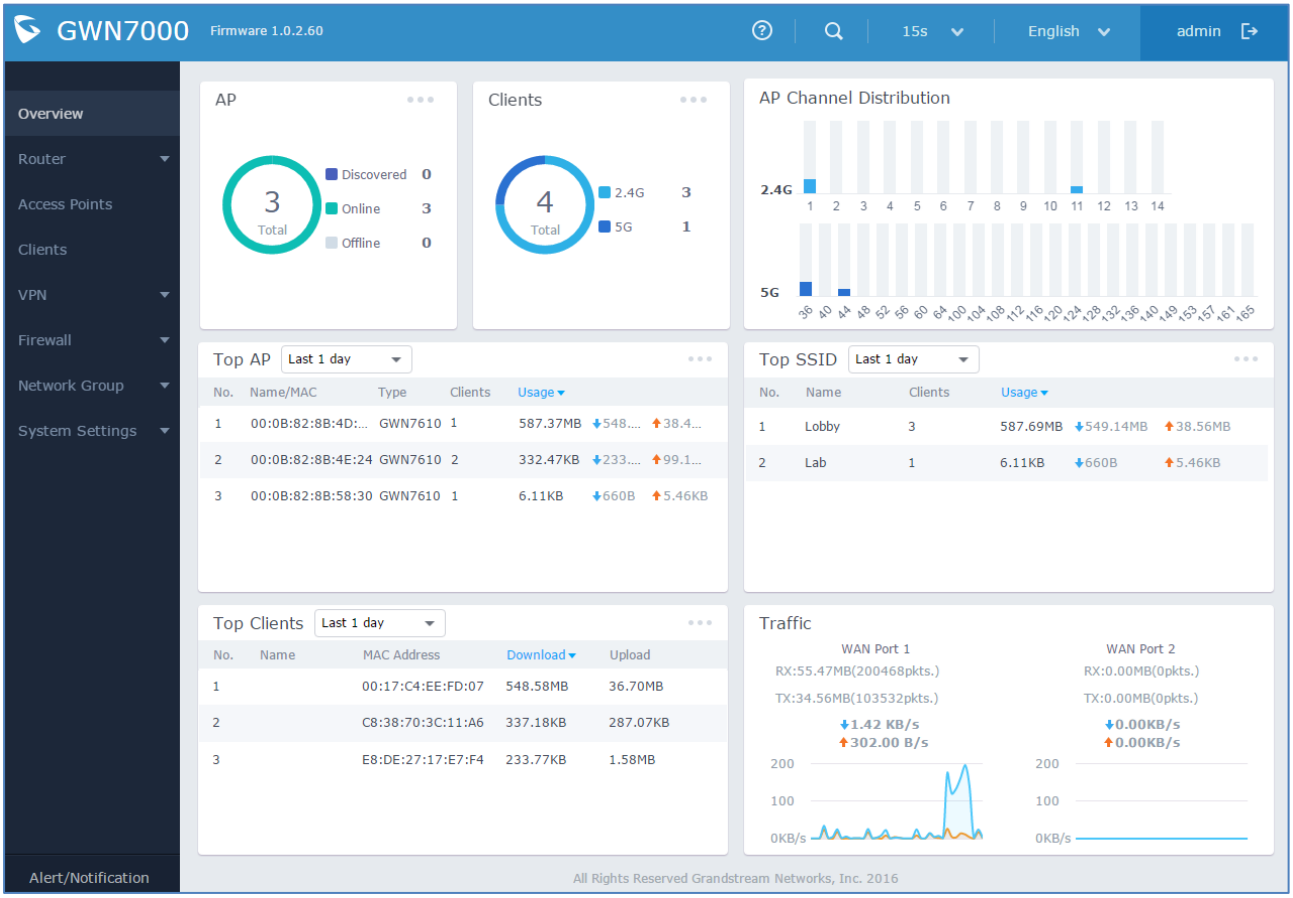


Figure 8: Overview Page

It is used to show the status of the GWN7000 for different items, please refer to the following table for each item:

Table 4: Overview

AP	Shows the number of Access Points that are Discovered, Paired (Online) and Offline. Click on ••• to go to Access Points' page for basic and advanced configuration options for the APs
Clients	Shows the total number of connected clients, and a count for clients connected to each Channel. Click on ••• to go to Clients page for more options.
AP Channel Distribution	Shows the Channel used for all APs that are paired with this Access Point.

Top AP	Shows the Top APs list, assort the list by number of clients connected to each AP or data usage combining upload and download. Click on ••• to go to Access Points page for basic and advanced configuration options for the APs.
Top SSID	Shows the Top SSIDs list, assort the list by number of clients connected to each SSID or data usage combining upload and download. Click on ••• to go to Network Group page for more options.
Top Clients	Shows the Top Clients list, assort the list of clients by their upload or download. Click on ••• to go to Clients page for more options.
Traffic	Shows the sent/received traffic data speeds on both WAN ports.

Note that Overview page in addition to other tabs can be updated each 15s, 1min, 2min, 5min or Never by clicking in the upper bar menu (Default is 15s).

Save and Apply Changes

When clicking on "Save" button after configuring or changing any option on the web GUI pages. A message mentioning the number of changes will appear on the upper menu.

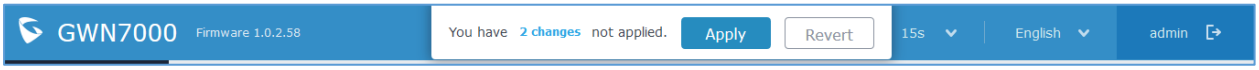


Figure 9: Apply Changes

Click on Apply button to apply changes, or Revert to undo the changes.

ROUTER CONFIGURATION

This section includes configuration pages for network WAN ports, static routes, QoS and DDNS and shows also the router status.

Status

Status page displays **Device Status** to check MAC address, Part Number, Firmware related information and Uptime for the GWN7000; and **WAN Status** showing general information about WAN Ports such as uptime, current throughput, aggregate usage, and IP address.

Router's Status page can be accessed from **Web GUI->Router->Status**.

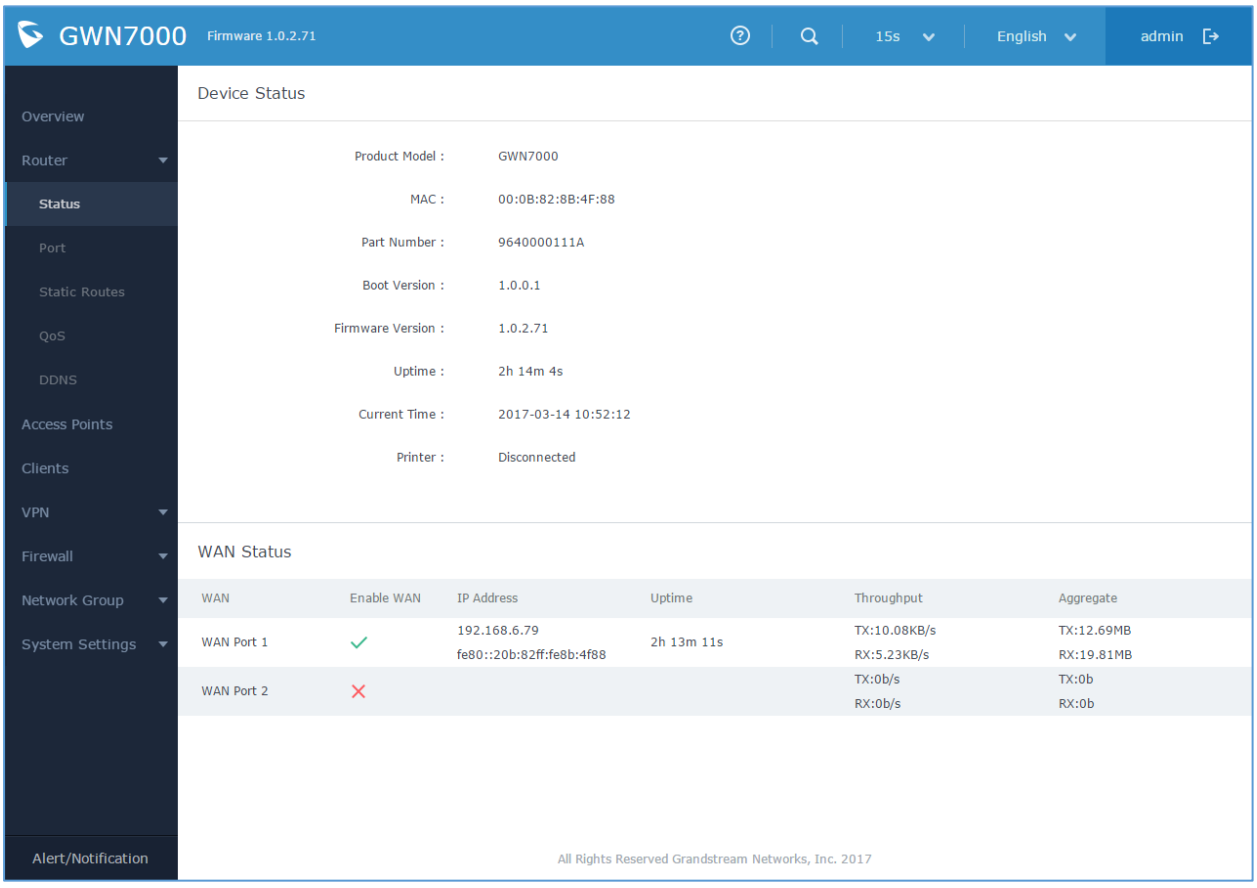


Figure 10: Router's Status

Ports Configuration

Connect to GWN7000's Web GUI from a computer connected to a LAN port and go to **Router**->**Port** page for Port configuration.

WAN Ports Settings

The GWN7000 has 2 WAN ports configured as DHCP clients by default. Each port can be connected with DSL modem or routers.
WAN ports support also setting static IPv4/IPv6 addresses, and configure PPPoE for each WAN port.

Please refer to the following table for basic network configuration parameters on WAN ports for GWN7000.

Table 5: GWN7000 WEB GUI -> Router ->Port -> WAN Port (1,2)

Enabled	Choose whether to enable or disable the WAN port.
WAN Address Type	Select "DHCP", "Static" or "PPPoE" mode on the WAN interfaces of GWN7000. The default setting is "DHCP". • **DHCP** When selected, it will act as a DHCP client and acquire an IPv4 address automatically from the DHCP server. • **Static** When selected, the user should set a static IPv4 address, Subnet Mask, IPv4 Gateway and adding Additional IPv4 Addresses as well. • **PPPoE** When selected, the user should set the PPPoE account and password, PPPoE Keep alive interval and Inter-Key Timeout (in seconds).
Preferred IPv4 DNS	Enter the preferred DNS server address (IPv4 address). If Preferred DNS is set, GWN7000 will use it in priority.
Alternate IPv4 DNS	Enter the Alternate DNS server address (IPv4 address). If Preferred DNS is set, GWN7000 will use it in when the Preferred DNS fails.
Native IPv6	Used to enable assigning IPv6 address to GWN7000. Once checked users will be able to configure following fields: "IPv6 Address Assignment", "Preferred IPv6 DNS", "Alternate IPv6 DNS" and "IPv6 Relay to LAN".
IPv6 Address Assignment	This option is appearing when enabling "Native IPv6" option. Select "Auto" to get an IPv6 address from DHCP server or "Static" to configure manually an IPv6 address. If set to Static, the following fields should be configured: • **IPv6 Address/Prefix Length** Used to set an IPv6 address/Prefix length when using Static IPv6 option

	Example: *fec0:470:28:5b2::1/64* • **IPv6 Gateway** Used to define the Gateway's IPv6 address. • **IPv6 Prefix/IPv6 Prefix Length** Enter the IPv6 prefix and IPv6 prefix length. Example: *::1/64*
Preferred IPv6 DNS	This option appears only when "Native IPv6" option is enabled. It is used to set a preferred DNS server address (IPv6 address). If Preferred DNS is set, GWN7000 will use it in priority.
Alternate IPv6 DNS	This option appears only when "Native IPv6" option is enabled. It is used to set an Alternate DNS server address (IPv6 address). If Preferred DNS is set, GWN7000 will use it in when the Preferred DNS fails.
IPv6 Relay to LAN	This option appears only when "Native IPv6" option is enabled. When enabled the GWN7000 will relay IPv6 address to LAN clients
Multi-WAN	These options are used when both WAN ports are enabled and using Failover feature: • **Tracking IP** Configures the tracking IP(s). ICMP packets are being used to track the IP(s) address(es). When the tracking fails, the GWN7000 will use the secondary WAN port as failover. Default IP used is 8.8.8.8. • **Tracking Timeout (sec)** Configures tracking timeout in seconds. Default value is 2. • **Tracking Interval (sec)** Configures the track interval in seconds. Default value is 5. • **Bandwidth** Specifies the bandwidth for the port, e.g: "100k", "1M" or "100M".
VLAN Tagging	Used to enable VLAN tagging. If set to "0" the VLAN tagging will be disabled, otherwise set a VLAN value between 5 and 4093. Default is 0.

Tunnel

Tunnel page is used to set IPv6 tunnels on WAN ports via IPv6 tunnel brokers service providers, this serves the purpose of transferring IPv6 packets over IPv4 Network. It supports creating 6in4, 6rd and aiccu tunnels. Please refer to below tables for each tunnel type.

Table 6: 6in4 Tunnels

WAN Interface	Choose the WAN port on which to setup the 6in4 tunnel.
MTU	Set the Maximum Transmission Unit value. The valid range is 64-9000.

	Default value is 1500.
6in4 IPv4 Peer Address	Enter the IPv4 tunnel endpoint at the tunnel's provider.
6in4 Tunnel Endpoint IPv6 Address	Enter the local IPv6 address delegated to the tunnel endpoint. Example: 2001:db8:2222::2/64
6in4 Routed Prefix	Set the routable prefix given by the tunnel provider to allow LAN clients to get addresses from that prefix.
Tunnel ID	Specifies the tunnel's ID.
Username	Set the username used to login into the tunnel broker.
Password	Set the password (used for endpoint update).
Update Key	Set the update key, it overrides the password used for endpoint update.

Table 7: 6rd Tunnels

WAN Interface	Choose the WAN port on which to setup the 6rd tunnel.
MTU	Set the Maximum Transmission Unit value. The valid range is 64-9000. Default value is 1500.
6rd IPv4 Peer Address	Enter the IPv4 Peer address.
6rd IPv6 Address Prefix	Specifies the IPv6 prefix given by the provider. Example: 2001:B000::/32
IPv6 Prefix Length	Specifies the IPv6 prefix length (Value between 1 and 128). Example: 32
IPv4 Prefix Length	Specifies the prefix length of the IPv4 transport address. (Value between 1 and 32).

Table 8: aiccu Tunnels

WAN Interface	Choose the WAN port on which to setup the aiccu tunnel.
Username	Enter the Username (Provided by signing up with SixXS Tunnel Broker)
Password	Enter the Username's password

Global Settings

This section specifies operating mode for multi-WAN that will be used for enabling/disabling Failover and Load Balancing on WAN ports, and banning MAC addresses.

The following table shows the configuration parameters for Multi-WAN settings

Table 9: GWN7000 WEB GUI->Router->Port->Global Settings

Multi-WAN	Three options are available: • Disabled • Failover • Load Balance + Failover
Disabled	This will disable Multi-WAN feature
Failover	If chosen failover will be enabled on WAN ports, admins need to choose the Primary WAN port to be used. When selected, user can set **Multi-WAN** parameters on WAN ports.
Load Balance + Failover	In addition to failover, load balance will be used on both ports to optimize the resource utilization. Please note that for this feature to work, WAN ports should be connected to different networks. When selected, user can set **Multi-WAN** parameters on WAN ports.
Banned Client MAC	Shows the list of banned clients MAC addresses, other MAC addresses could be also added by clicking on ⊕ or removed by clicking on ⊖.
MAC Override	MAC Override feature is used to give a virtual MAC address to the GWN7000, in order that any client connected to the Router will be using the entered MAC address. **Note**: Please make sure to enter the Override MAC address in lower cases.

Port Mirroring

With port mirroring enabled, the GWN7000 will send a copy of all network packets seen on one LAN port to another port, where the packet can be analyzed. Refer to the below table for the available fields to configure.

Table 10: Port Mirroring

Enable Outgoing Mirroring	Check to enable outgoing mirroring for a LAN port. Default is “Disabled”
Enable Incoming Mirroring	Check to enable incoming mirroring for a LAN port. Default is “Disabled”
Mirroring Port	Select which LAN port that will be mirroring traffic. Default is “Disabled”
Mirrored Port	Select which LAN port that will act as mirrored port. Default is “Disabled”

Static Routes

GWN7000 supports setting manually static IPv4 and IPv6 routes as well as displaying routing table entries.

Static routes configuration page can be accessed from GWN7000 WebGUI**->Router->Static Routes:**

Three tabs are available:

- **Routes** to view routing table entries.
- **IPv4** to create, edit or delete static IPv4 static routes.
- **IPv6** to create, edit or delete static IPv6 static routes.

Following actions are available in both **IPv4** and **IPv6** tabs:

- To add a new static route, click on 

- To edit a static route, click on 
- To delete a static route, click on 

Refer to the following tables when editing or creating IPv4/IPv6 static routes:

Table 11: IPv4 Static Routes

Name	Enter the Name of the static route to be configured.
Enabled	Select whether to enable or disable this static route.
Source Group	Choose the LAN's Network Group, which will be using this static route.
Target Network/Host	Enter the Network/Host IP address on which to route the traffic to. Example: 192.168.5.0
Netmask	Enter the Network/Host Netmask. Example: 255.255.255.0
Gateway	Enter the Gateway's IP address. Example: 192.168.5.1.
Metric	Set the metric value. The valid range is 0-255. Default value is 1.

Table 12: IPv6 Static Routes

Name	Enter the Name of the static route to be configured.
Enable	Select whether to enable or disable this static route.
Group	Choose the LAN's Network Group
Target Network/Host	Enter the Network/Host IP address on which to route the traffic to. 2001:db8:3c4d:4::/64
Gateway	Enter the Gateway's IP address. fec0:470:28:5b2::1/64
Metric	Set the metric value. The valid range is 0-255. Default value is 1.

QoS

The GWN7000 offers the possibility to enable and configure QoS on both WAN and LAN interfaces, this will help to manage in more depth the network traffic to define priority and classify different services and protocols in a scheduled manner.

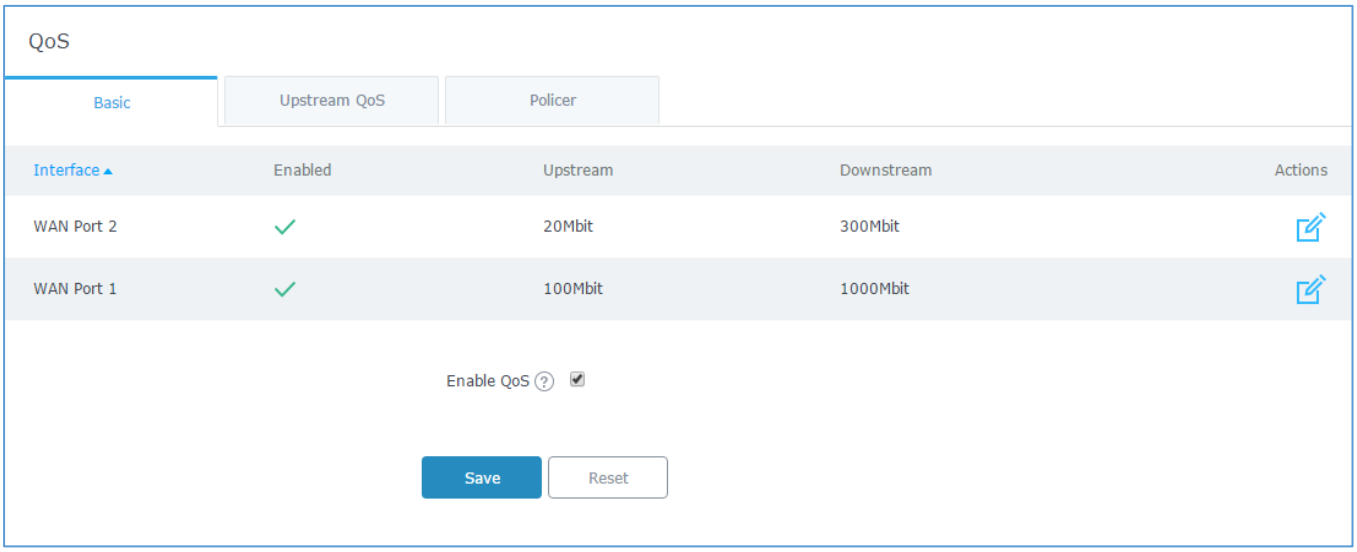


Figure 11: QoS

To activate QoS, check "**Enable QoS**". Three tabs are available for configuration:

- **Basic**: Download and upload bandwidth speeds settings on each WAN interface.
- **Upstream QoS**: Upstream QoS allows creating Traffic Classes to prioritize traffic for specific resources on the network by controlling transmission/upload rate. Note that different classes can be created and assigned as Traffic filters by respecting following conditions:
  - ✓ The total of Upstream bandwidth values of each created class should not exceed the upstream bandwidth value configured in **Basic.**
  - ✓ The remaining bandwidth will be lent to the next priority level of class.
  - ✓ All filter options are summed together.
- **Policer**: While Upstream QoS is dealing with traffic transmission, Policer is controlling the incoming traffic. Thus, allowing to create rules to specific targets to set priority and received traffic rate, giving the GWN7000 the ability to drop the exceeding traffic when reaching the configured maximum rate.

Refer to the following tables for each tab option:

Table 13: QoS Basic

Enabled	Check to enable upstream and downstream bandwidth speeds for the selected WAN interface.
Upstream	Set the Upstream value to specify the upload bandwidth for selected interface, the value should end with Mbit, Kbit or with no unit if the set value is referring to "bit" unit. Note that the set value will affect and limit the bandwidth values on created classes on **QoS Upstream**. Examples: *500Mbit* *100Kbit* *500*
Downstream	Set the Downstream value to specify the download bandwidth speed for selected interface, the value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. Examples: *1000Mbit* *100Kbit* *500*

Table 14: Upstream QoS

Traffic Class	
Name	Define a name for the traffic class.
Priority	Set the priority of the traffic class, the lower the value, the highest the priority. Valid range is between 1 and 64.
Interface	Select the WAN interface from which the traffic will be classified, make sure to enable the desired interface it from **QoS Basic** in order to appear.
Upstream	Set Upstream bandwidth value. The value should end with "Mbit", "Kbit" or with no unit if the set value is referring to "bit" unit. Note that the sum of created classes should have upstream bandwidth speeds lower than the Upstream bandwidth value configured on **QoS Basic**. Examples: *100Mbit* *100Kbit* *500*
Traffic Filter	
Class	Select a class from created traffic classes using drop-down menu.
Name	Define a Name for the traffic filter rule.
DSCP	Choose the Differentiated Services Code Point (DSCP) value from drop-down list. Default is 0.
IP Source Address	Specify the Source IP address from which the traffic filter rule will be applied.

IP Destination Address	Specify the Destination IP address to which the traffic filter rule will be applied.
TCP Source Port	Specify the TCP Source port from which the traffic filter rule will be applied.
TCP Destination Port	Specify the TCP Source port to which the traffic filter rule will be applied.
UDP Source Port	Specify the UDP Source port from which the traffic filter rule will be applied.
UDP Destination Port	Specify the UDP Source port to which the traffic filter rule will be applied.
Group Source	Choose the LAN group of the specified Source IP address. If no Source IP address has been defined, the rule will be applied to all members of that LAN group.

Table 15: QoS Policer

Name	Define a Name for the Policer rule.
Interface	Select an interface from which the traffic will be policed, make sure to enable the desired interface it from **QoS Basic** in order to appear.
Priority	Set the priority of the traffic class, the lower the value, the highest the priority. Valid range is between 1 and 64.
Rate	Set a Rate value for download bandwidth when applying policer rule.
DSCP	Choose the Differentiated Services Code Point (DSCP) value from drop-down list. Default is 0.
IP Source Address	Specify the Source IP address from which the policer rule will be applied.
IP Destination Address	Specify the Destination IP address to which the policer rule will be applied.
TCP Source Port	Specify the TCP Source port from which the policer rule will be applied.
TCP Destination Port	Specify the TCP Source port to which the policer rule will be applied.
UDP Source Port	Specify the UDP Source port from which the policer rule will be applied.
UDP Destination Port	Specify the UDP Source port to which the policer rule will be applied.
Group Source	Choose the LAN group of the specified Source IP address. If no Source IP address has been defined, the rule will be applied to all members of that LAN group.

DDNS

DDNS allows accessing GWN7000 via domain name instead of IP address, the GWN7000 supports following DDNS providers:

- Dyndns.org
- Changeip.com
- Zoneedit.com
- Free.editdns.net
- Freedns.afraid.org
- He.Net
- Dnsomatic.Com
- No-ip.pl
- Myonlineportal.net

Before configuring DDNS settings on the GWN7000, make sure first to create and confirm the DDNS account via supported providers.

Following steps illustrates how to configure the DDNS settings on your GWN7000:

1. Access to GWN7000 web GUI, and navigate to **Router -> DDNS**, and enable **DDNS** service.
2. Fill in the domain name created with DDNS provider under **Domain Name** field.
3. Enter your account username and password under **Username** and **Password** fields.
4. Specify the WAN interface to which DDNS is applied under **Network interface** field.
5. (Optional) For advanced configuration, it is also possible log to Syslog and modify the values of refreshing fields so to check periodically the updated IP address.

SETTING UP A WIRELESS NETWORK

The GWN7000 Enterprise Router provides the user with the capability to create a wireless network by adding multiple GWN76xx series access points, with connectivity over the most common wireless standards (802.11b/g/n) operating in both 2.4GHz and 5GHz range.

The GWN7000 integrates multiple layers of security including the IEEE 802.1x port-based authentication protocol, Wired Equivalent Privacy (WEP), Wi-Fi Protected Access (WPA and WPA2) and firewall and VPN tunnels.

This chapter will introduce how to discover, add the GWN76xx access points, create and manage Wi-Fi Networks.

For more details about Grandstream GWN76xx Access points, refer to
http://www.grandstream.com/products/networking-solutions/wifi-access-points

Discover and Pair GWN76xx Access Points

The GWN76xx are powerful access points, which are fully compatible with the GWN7000 and can be added with one click, provisioned and managed in an easy and intuitive way. Once a GWN76xx is successfully connected and has an IP from the GWN7000 router, user can then pair it to the GWN7000 and associate it with a Network Group.

To Pair a GWN76xx access point connected as LAN client to the GWN7000, follow the below steps:

1. Connect to the GWN7000 Web GUI and go to **Access Points.**

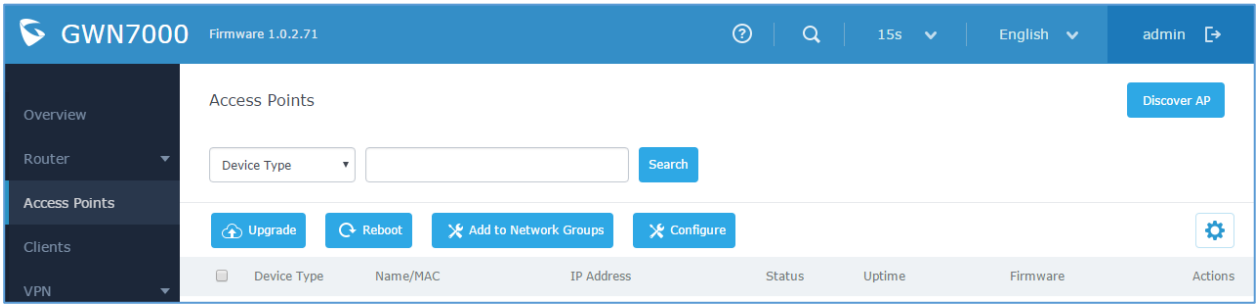


Figure 12: Discover AP

2. Click on Discover AP to discover access points within GWN7000's Network, the following page will appear.

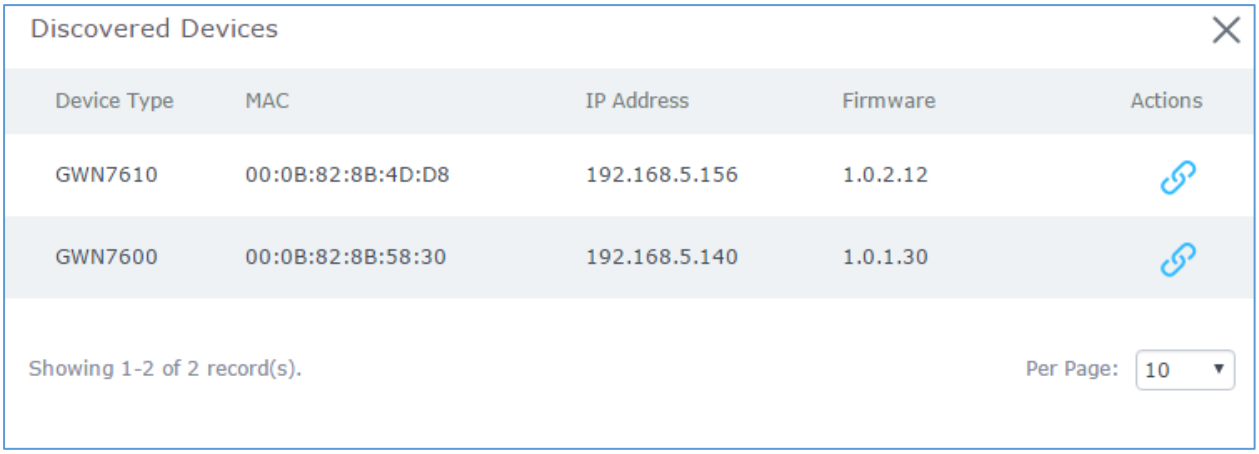


Figure 13: Discovered Devices

3. Click on Pair under Actions, to pair the discovered Access Point with the GWN7000.

4. The paired GWN76xx will appear Online, Click on to unpair it.

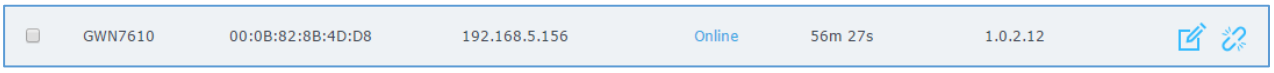


Figure 14: GWN7610 online

5. Click on next to paired access point to check device configuration for its status, users connected to it and configuration, or select multiple GWN76xx APs from the same model, and click on Configure to apply same configuration on selected units.

   Refer to below table for Device Configuration tabs.

Table 16: Device Configuration

Status	Shows the device's status information such as Firmware version, IP Address, Link Speed, Uptime, and Users count via different Radio channels.
Users	Shows the users connected to the GWN76xx access point.
Configuration	• **Device Name:** Set GWN76xx's name to identify it along with its MAC address.

- **Fixed IP:** Used to set a static IP for the GWN76xx, if checked, the following needs to be configured:
  -IPv4 Address: Enter the IPv4 address to be set as static for the device
  -IPv4 Subnet Mask: Enter the Subnet Mask.
  -IPv4 Gateway: Enter the Network Gateway's IPv4 Address.
  -Preferred IPv4 DNS: Enter the Primary IPv4 DNS.
  *-Alternate IPv4 DNS***:** Enter the Alternate IPv4 DNS.
- **Frequency:** Set the GWN76xx's frequency, it can be either 2.4GHz, 5GHz or Dual-band.
- **Enable Band Steering:** When Frequency is set to Dual-Band, check this option to enable Band Steering on the Access Point, this will help redirecting clients to a radio band accordingly for efficient use and to benefit from the maximum throughput supported by the client.
- **Mode:** Choose the mode for the frequency band, 802.11n/g/b for 2.4Ghz and 802.11ac for 5Ghz.
- **Channel Width:** Choose the Channel Width, note that wide channel will give better speed/throughput, and narrow channel will have less interference. 20Mhz is suggested in very high density environment.
- **40MHz Channel Location:** Configure the 40MHz channel location when using 20MHz/40MHz in Channel Width, it can be set it to be "Secondary Below Primary", "Primary Below Secondary" or "Auto".
- **Channel:** Select "Auto" or a specific channel. Default is "Auto". Note that the proposed channels depend on **Country** Settings under **System Settings–>Maintenance**.
- **Enable Short Guard Interval:** Check to activate this option to half the guard interval (from 800ns to 400ns) ensuring that distinct transmissions do not interfere with one another, this will help increasing throughput.
- **Active Spatial Streams:** Choose active spatial stream. Available options: "Auto", "1 stream", "2 streams" and "3 streams" (For GWN7610).

	• **Radio Power:** Set the Radio Power depending on desired cell size to be broadcasted, three options are available: “Low”, “Medium” or “High”. Default is “High”.

Note

If a GWN76xx is not being paired, or the pair icon is grey color, make sure that it is not being paired with another GWN7000 Router or GWN76xx Access Point acting as Master Controller, if yes, it needs to be unpaired first, or reset to factory default settings to make it available for pairing.

Network Groups

GWN7000 support creating up to 16 different Network groups separated by VLANs and adding paired GWN76xx Access Points.

To access Network Groups configuration page, log in to the GWN7000 WebGUI and go to **Network Group->Network Group.**

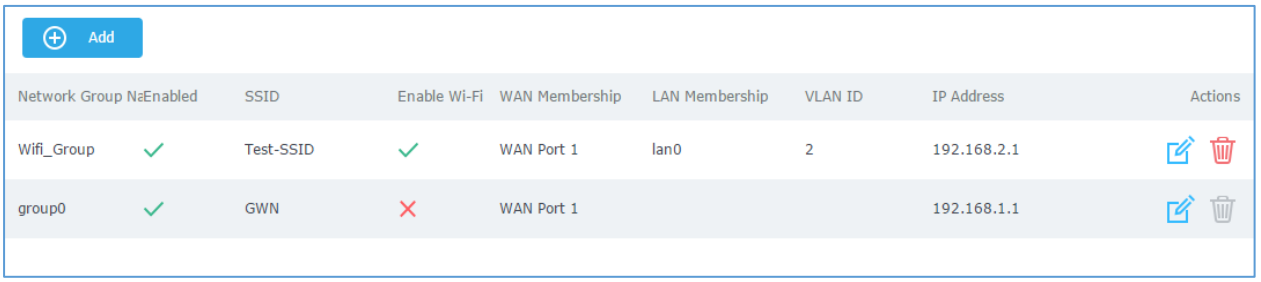


Figure 15: Network Group

The GWN7000 will have a default network group named group0, click on  to edit it, or click on  to add a new network group.

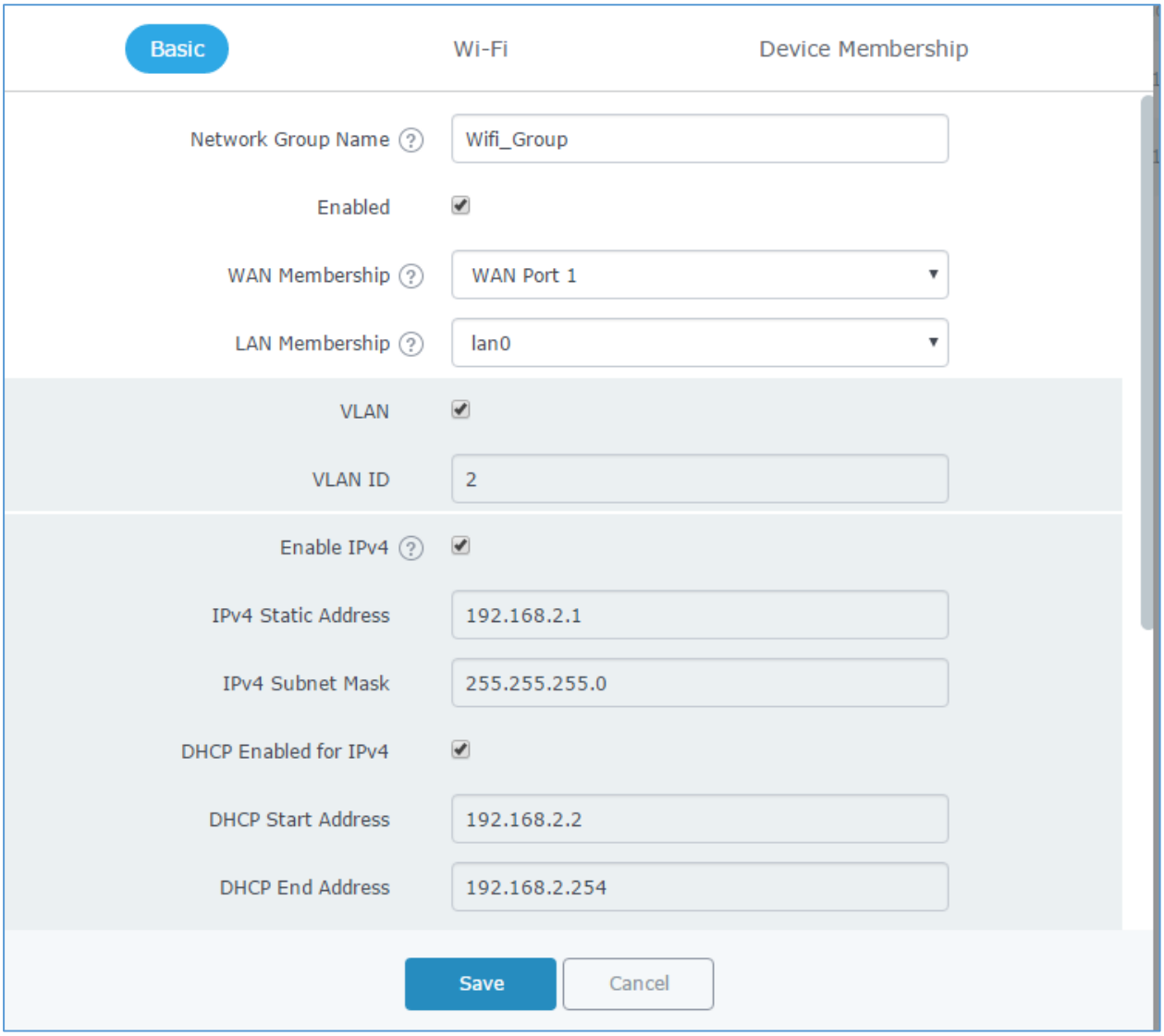


Figure 16: Add a New Network Group

When editing or adding a new network group, following tabs will appear to configure a network group:

- **Basic:** Used to name the network group, and set a VLAN ID if adding a new network group, and addressing plans, refer to below table for each field.

Table 17: Basic

Network Group Name	Specifies the name for the network group.
WAN Membership	Select the WAN port membership. Or use Multi-WAN option if enabled under **Router->Port->Global Settings**
LAN Membership	Select the LAN port membership.

VLAN	Check to enable VLAN. This field is appearing only when having more than a network group.
VLAN ID	Set a VLAN ID. Valid range is between 2 and 4093.
Enable IPv4	Check to enable IPv4 addressing for this network group
IPv4 Static Address	Set a static IPv4 address for the network group when enabling IPv4.
IPv4 Subnet Mask	Set the Subnet Mask.
DHCP Enabled for IPv4	Check to enable DHCP using IPv4. This will allow clients connected to this network group to get IPv4 addresses automatically from GWN7000 acting as DHCP server.
DHCP Start Address	Set the starting IPv4 address for this network group's clients.
DHCP End Address	Set the ending IPv4 address for this network group's clients
DHCP Lease Time	Set the lease time for DHCP clients, the value can be defined in hours, minutes, or as "infinite". Default lease time is "12h".
DHCPv4 Options	Set the DHCP options. Click on to add another option, and to delete an option. **Example: 44,192.168.2.50** *for DHCP option 44 and 192.168.2.50 is the WINS server's address.* Please refer to the following link for DHCP options syntax: https://wiki.openwrt.org/doc/howto/dhcp.dnsmasq
DHCPv4 Relay Enabled	Enable this option, if you want the GWN7000 relays the DHCP requests from clients to another DHCP server(s). Once checked Click on to add another DHCPv4 Relay Target, and to delete a DHCPv4 Relay Target.
Enable IPv4	Check to enable IPv6 addressing for this network group.
IPv6 Relay from WAN	Check to allow GWN7000 to relay IPv6 DHCP request from network group's clients to WAN port.
DHCP Enabled for IPv6	Check to enable DHCP server for IPv6 on this network group.
IPv6 Prefix for Assignment	Set the prefix value to be assigned to the network group. Valid range is between 1 to 64. Example: 64 will assign /64 prefixes.
IPv6 Subnet Hint	Set the subnet mask value.
IPv6 Uplink	Select the WAN port.
Enable Landing Page	Check to enable landing page when connecting to this network group's Wi-Fi. This will allow setting a landing page URL where wireless users will be redirected automatically to the configured URL.
Landing Page URL	Set the landing page URL to which clients will be redirected once connected to the network group's Wi-Fi.

- **Wi-Fi:** Please refer to the below table for Wi-Fi tab options

Table 18: Wi-Fi

Enable Wi-Fi	Check to enable Wi-Fi for the network group.
SSID	Set or modify the SSID name.
SSID Hidden	Select to hide SSID. SSID will not be visible when scanning for Wi-Fi, to connect a device to hidden SSID, potential wireless clients will need to specify SSID name and authentication password manually.
Security Mode	Set the security mode for encryption, 5 options are available: • **WEP 64-bit:** Using a static WEP key. The characters can only be 0-9 or A-F with a length of 10, or printable ASCII characters with a length of 5. • **WEP 128-bit:** Using a static WEP key. The characters can only be 0-9 or A-F with a length of 26, or printable ASCII characters with a length of 13. • **WPA/WPA2:** Using “PSK” or “802.1x” as WPA Key Mode, with “AES” or “AES/TKIP” Encryption Type. • **WPA2:** Using “PSK” or “802.1x” as WPA Key Mode, with “AES” or “AES/TKIP” Encryption Type. Recommended configuration for authentication. • **Open:** No password is required. Users will be connected without authentication. Not recommended for security reasons.
Use MAC Filtering	Choose Blacklist/Whitelist to specify MAC addresses to be excluded/included from connecting to the zone’s Wi-Fi. Default is Disabled.
Client Isolation	Client isolation feature blocks any TCP/IP connection between connected wireless clients via GWN76xx’s WiFi access point. Client isolation can be helpful to increase security for Guest networks/Public Wi-Fi. If enabled, the default LAN Gateway’s MAC address must be specified under **Gateway MAC Address** field. The clients will not be able to discover, ping or access other wireless devices connected to GWN7000’s network groups and only access to the default gateway, which usually means Internet access.

	If disabled, clients will have full access to any device connected to the network, including wireless clients across network groups. Default is “Disabled”.
Gateway MAC Address	This field is required when using **Client Isolation,** so users will not lose access to the Network (usually Internet). Type in the default LAN Gateway’s MAC address (router’s MAC address for instance) in hexadecimal separated by “:”. Example: 00:0B:82:8B:4D:D8
RSSI Enabled	Check to enable RSSI function, this will lead the AP to disconnect users below the configured threshold in **Minimum RSSI (dBm).**
Minimum RSSI (dBm)	Enter the minimum RSSI value in dBm. If the signal value is lower than the configured minimum value, the client will be disconnected. The input range is from “-94” or “-1”.

- **Device Membership:** Used to add or remove paired access points to the network group.

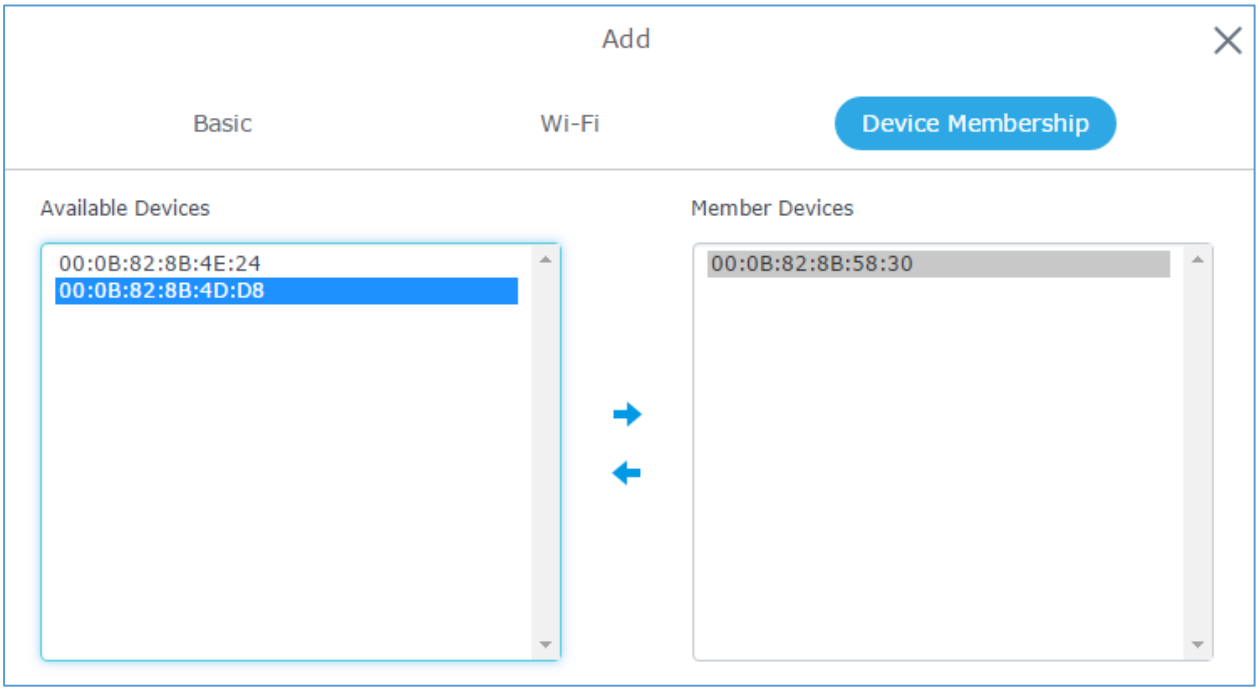


Figure 17: Device Membership

Click on → to add the GWN76xx to the network group, or click on ← to remove it.

It is also possible to add a device to a Network Group from Access Points Page:

- Select the desired AP to add to a Network Group and click on 

.

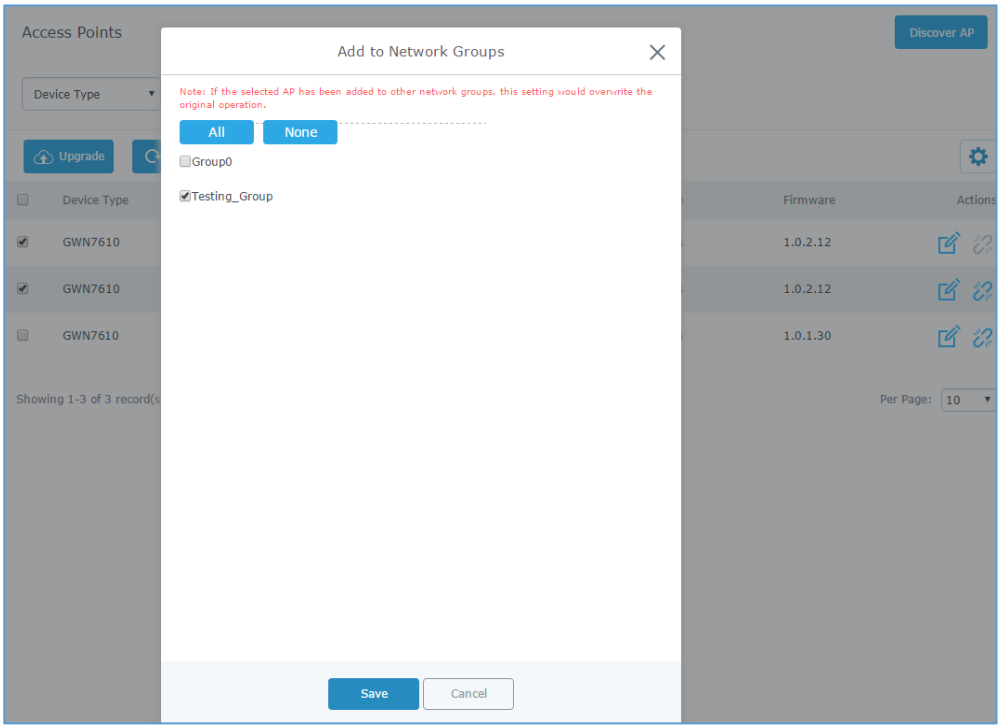


Figure 18: Add AP to Network Group from Access Points Page

- Check to select the desired Network, on which the selected APs will be added, as shown in the above figure.

Create an SSID under a Network Group

Under Network Group Page, click to edit a network group or create a new network group and go to Wi-Fi tab.

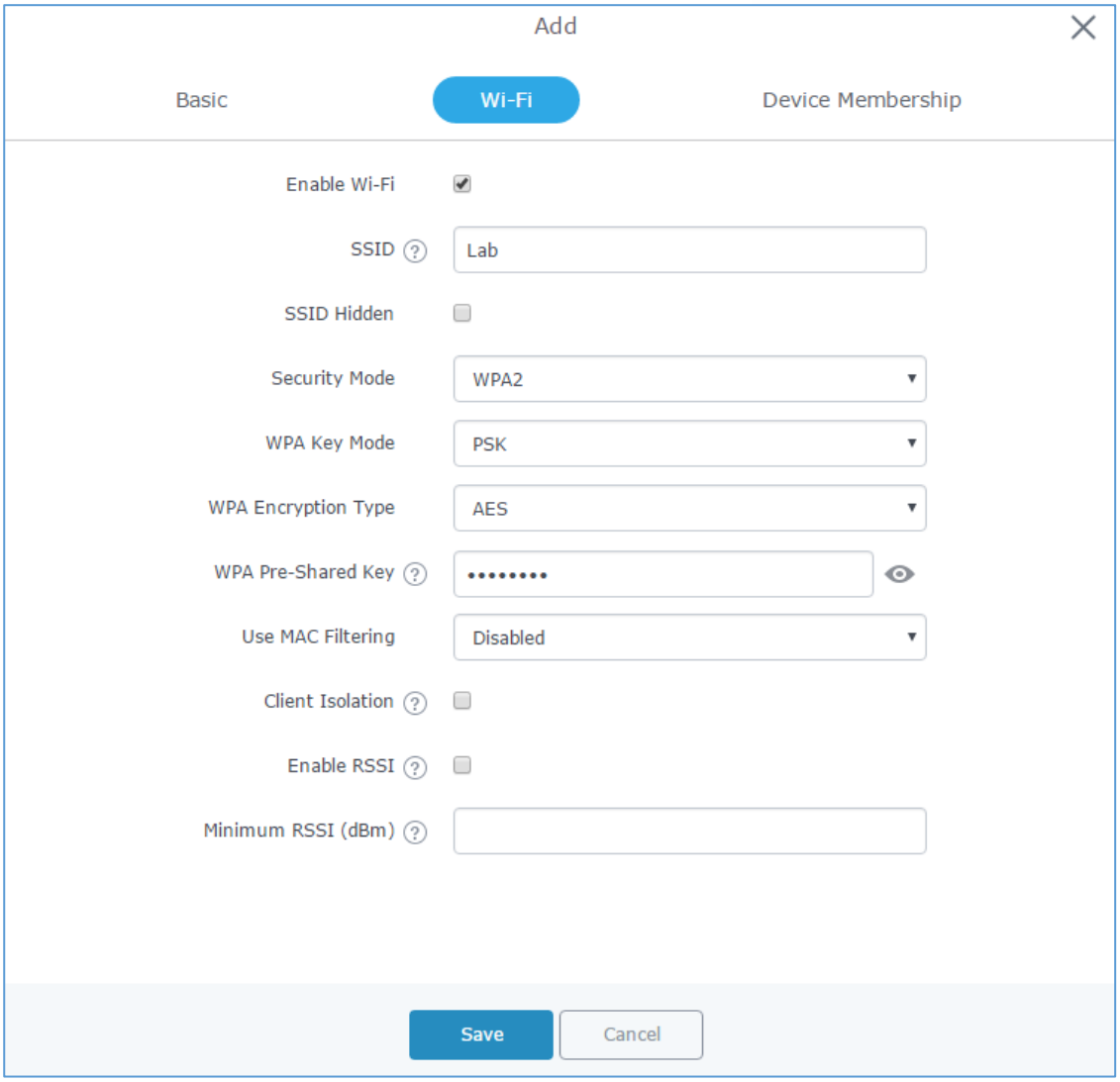


Figure 19: Create an SSID

Refer to [**Table 18: Wi-Fi**] for Wi-Fi options.

Additional SSID under Same Network Group

GWN7000 provides the ability to create an additional SSID under the same group.

To create an additional SSID go to **Network Group->Additional SSID.**

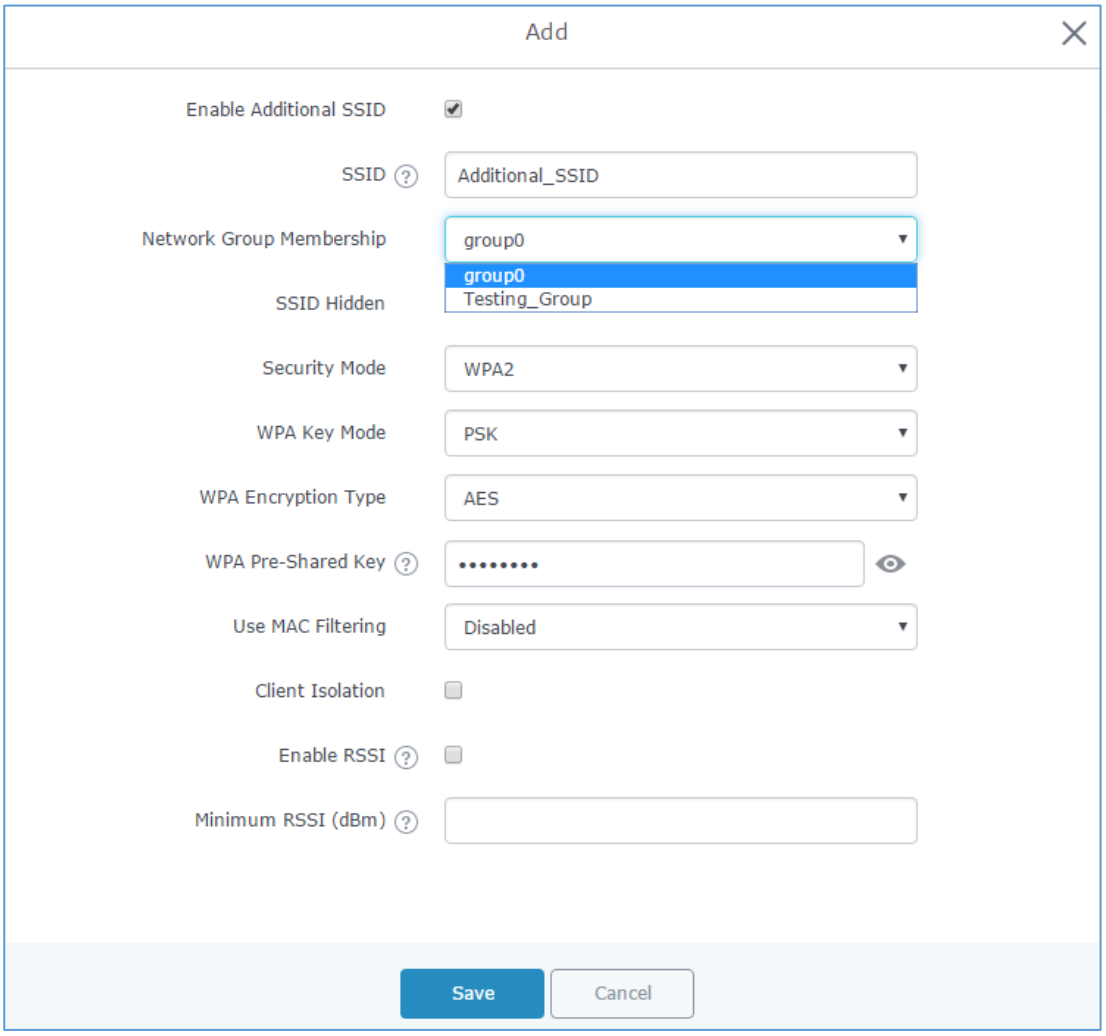


Figure 20: Additional SSID

Select one of the available network groups from **Network Group Membership** dropdown menu; this will create an additional SSID with the same Device Membership configured when creating the main network group.

SSID	Enabled	Network Group	Hidden	Security Mode	MAC Filtering	Client Isolati...	RSSI	Actions
Additional_SSID	✓	group0	✗	WPA2	Disabled	✗	✗	

Figure 21: Additional SSID Created

Click on to delete the additional SSID, or to edit it.

CLIENTS CONFIGURATION

Clients

Connected clients to different network groups can be shown and managed from a single interface.
Clients list can be accessed from GWN7000's **Web GUI** -> **Clients** to perform different actions to wired and wireless clients.

GWN7000 Enterprise Router with its DHCP server enabled on LAN ports level, will assign automatically an IP address to the devices connected to its LAN ports like a computer or GWN76xx access points and to wireless clients connected to paired GWN76xx access points.

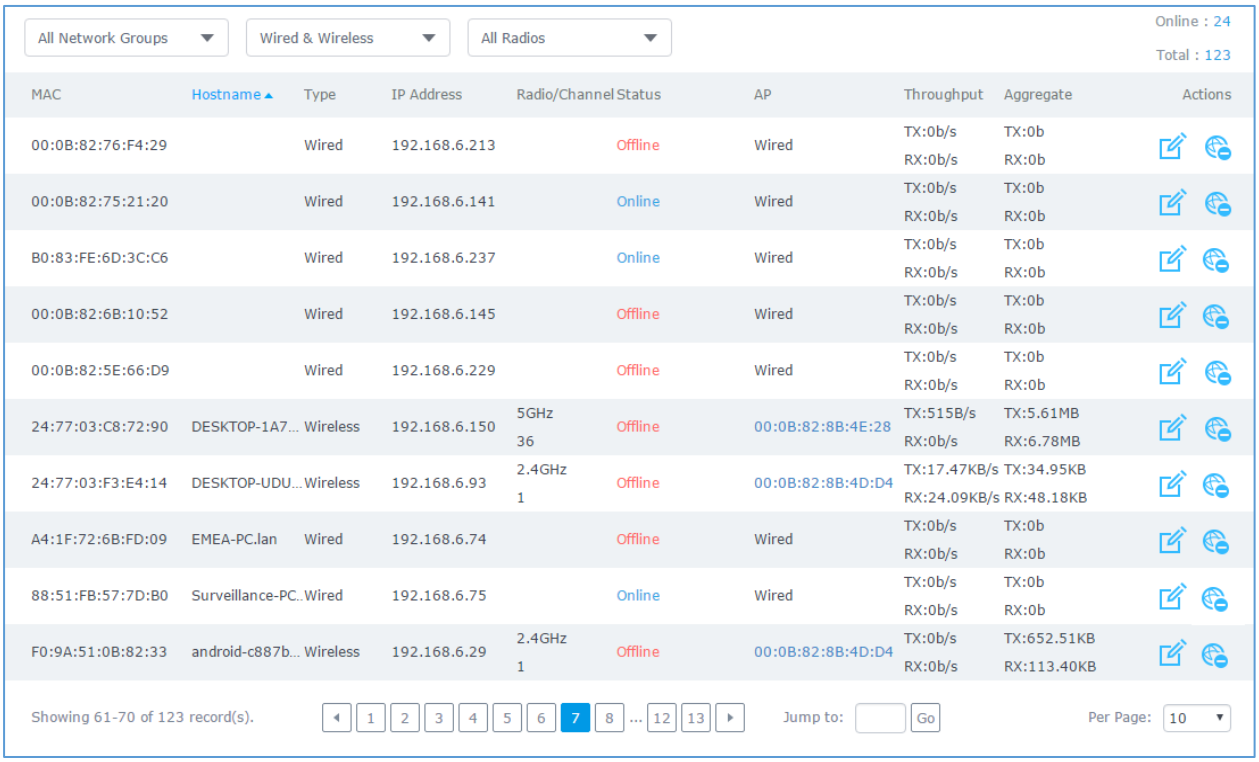


Figure 22: Clients

Click on  under Actions to check a client's status and modify its configuration.

Status

Used to check user's basic information such as MAC address, IP address, which Network group does it belong to, and to which access point if it is a wireless client, as well as Throughput and Aggregate usage.

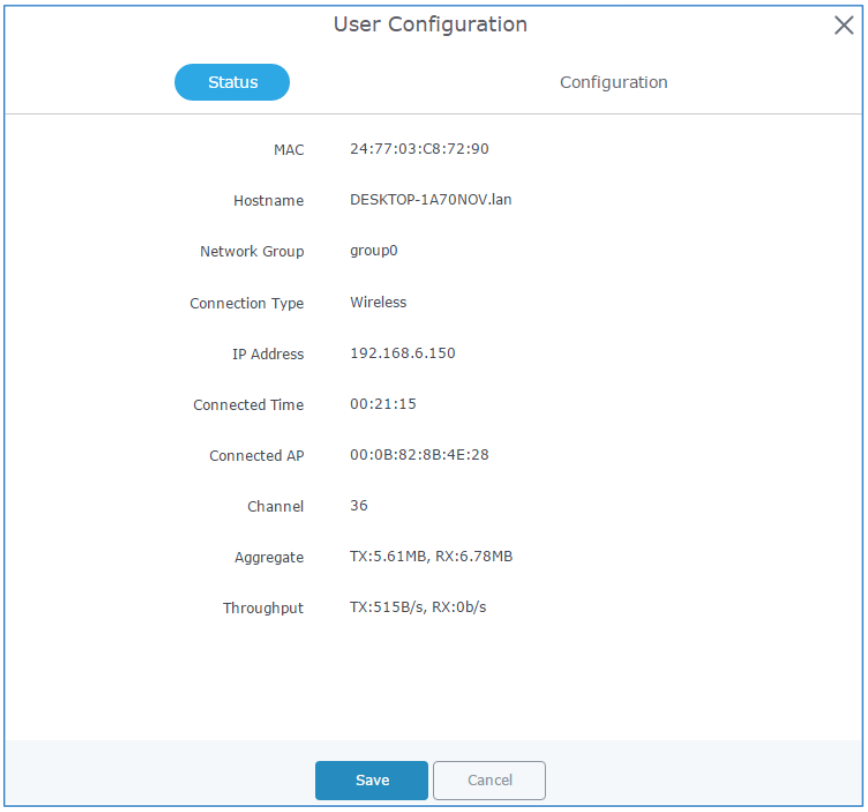


Figure 23: Client's Status

Edit IP and Name

Configuration tab allowing to set a name for a client and set a static IP.

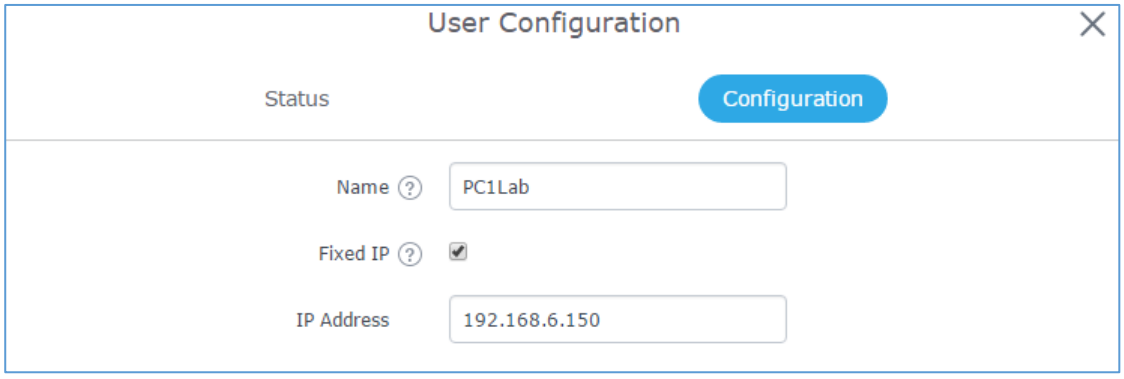


Figure 24: Client's Configuration

Block a client

To block a client, click on  under actions, this will add automatically the blocked client to *Banned Client MAC* list under **Router->Port->Global Settings.**

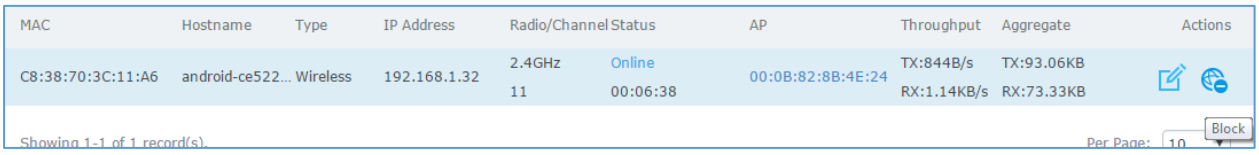


Figure 25: Block a Client

To unban a client, go to **Router -> Port -> Global Settings.** Click on  to remove it from the banned list**.**

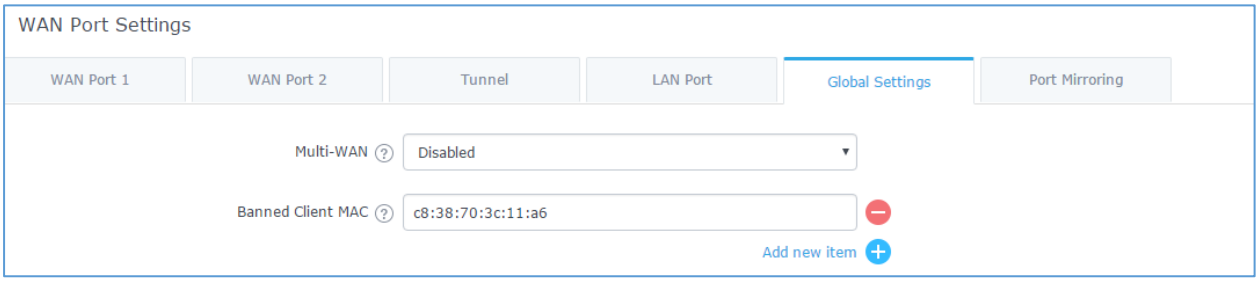


Figure 26: Unban Client

VPN (VIRTUAL PRIVATE NETWORK)

Overview

VPN allows the GWN7000 to be connected to a remote VPN server using PPTP, L2TP/IPSec and OpenVPN® protocols, or configure an OpenVPN® server and generate certificates and keys for clients, VPN page can be accessed from the GWN7000 Web GUI **-> VPN**.

OpenVPN® Server Configuration

To use the GWN7000 as an OpenVPN® server, you will need to start creating OpenVPN® certificates and client certificates. Before generating server/client certificates, it is requested to generate first the Certificate Authority (CA), which will help to issue server/clients certificates.

GWN7000 certificates can be managed from WebGUI **-> System Settings -> Cert. Manager**.

Generate Self-Issued Certificate Authority (CA)

A certificate authority (CA) is a trusted entity that issues electronic documents that verify a digital entity's identity on the Internet. The electronic documents (a.k.a. digital certificates) are an essential part of secure communication and play an important part in the public key infrastructure (PKI).

To create a Certification Authority (CA), follow below steps:

1. Navigate to "**System Settings -> Cert. Manager -> CAs**" on the GWN7000 web GUI.
2. Click on 

button. A popup window will appear.
3. Enter the CA values including CN, Key Length, and Digest algorithm… depending on your needs.

   Refer to below figure showing an example of configuration and below table showing all available options with their respective description.

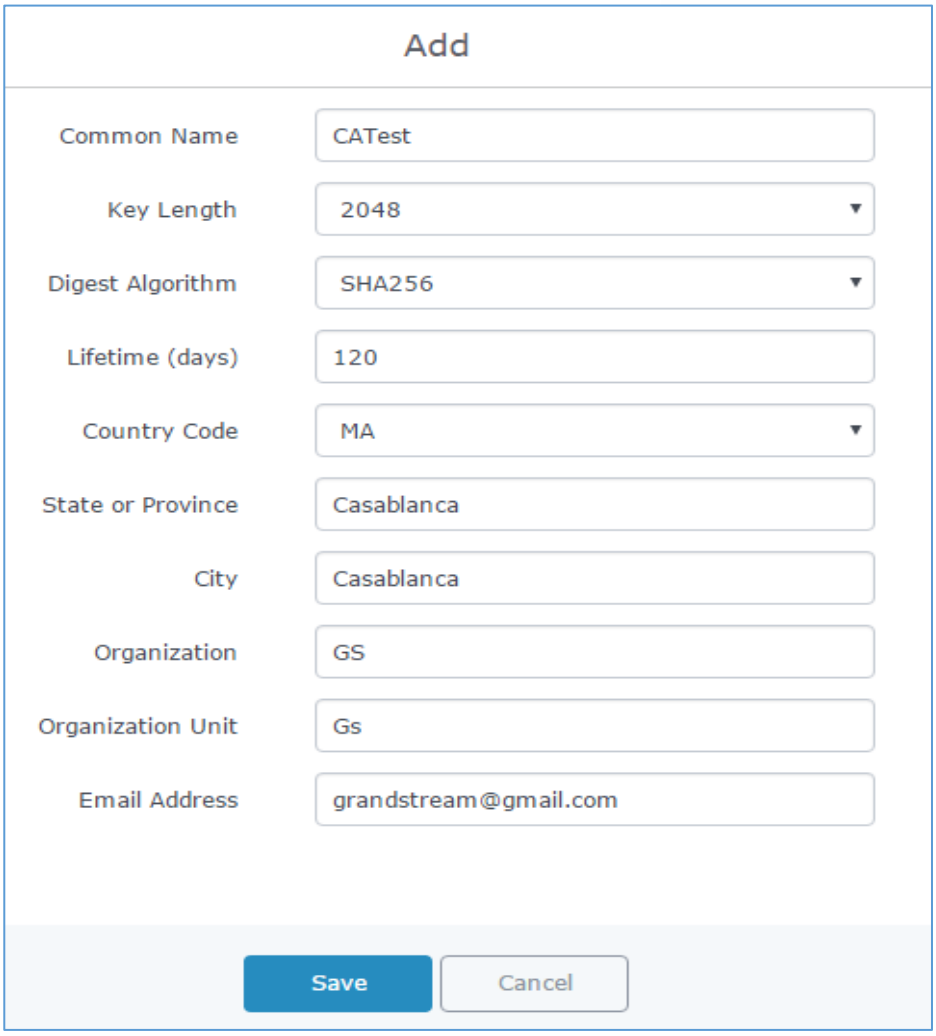


Figure 27: Create CA Certificate

Table 19: CA Certificate

Field	Description
Common Name	Enter the common name for the CA. It could be any name to identify this certificate. Example: “CATest”.
Key Length	Choose the key length for generating the CA certificate. Following values are available: • **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. • **SHA-256:** This digest algorithm generates an almost-unique, fixed size 256-bit (32-byte) hash. Hash is a one-way function – it cannot be decrypted back.
Lifetime (days)	Enter the validity date for the CA certificate in days. In our example, set to “120”.
Country Code	Select a country code from the dropdown list. Example: “MA”.
State or Province	Enter a state name or province. Example: “Casablanca”.
City	Enter a city name. Example: “Casablanca”.
Organization	Enter the organization name. Example: “GS”.
Organization Unit	Enter the organization unit name. Example: “Gs”.
Email Address	Enter an email address. Example: “grandstream@gmail.com”

4. Click on 

button after completing all the fields for the CA certificate.

5. Click on  button to export the CA to local computer. The CA file has extension “.crt”.

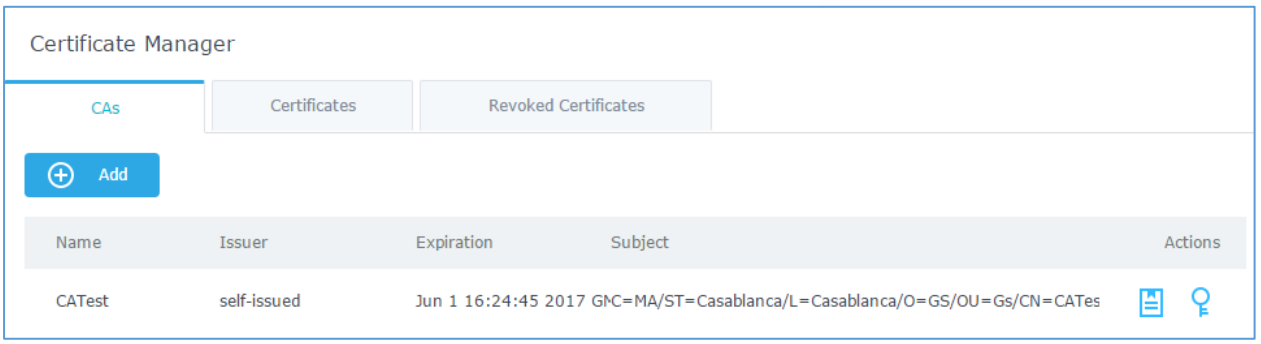


Figure 28: CA Certificate

Generate Server/Client Certificates

Create both server and client certificates for encrypted communication between clients and GWN7000 acting as an OpenVPN® server.

❖ Creating Server Certificate

To create server certificate, follow below steps:

1. Navigate to "**System Settings -> Cert. Manager -> Certificates**".

2. Click on 

button. A popup window will appear.

   Refer to below figure showing an example of configuration and below table showing all available options with their respective description.

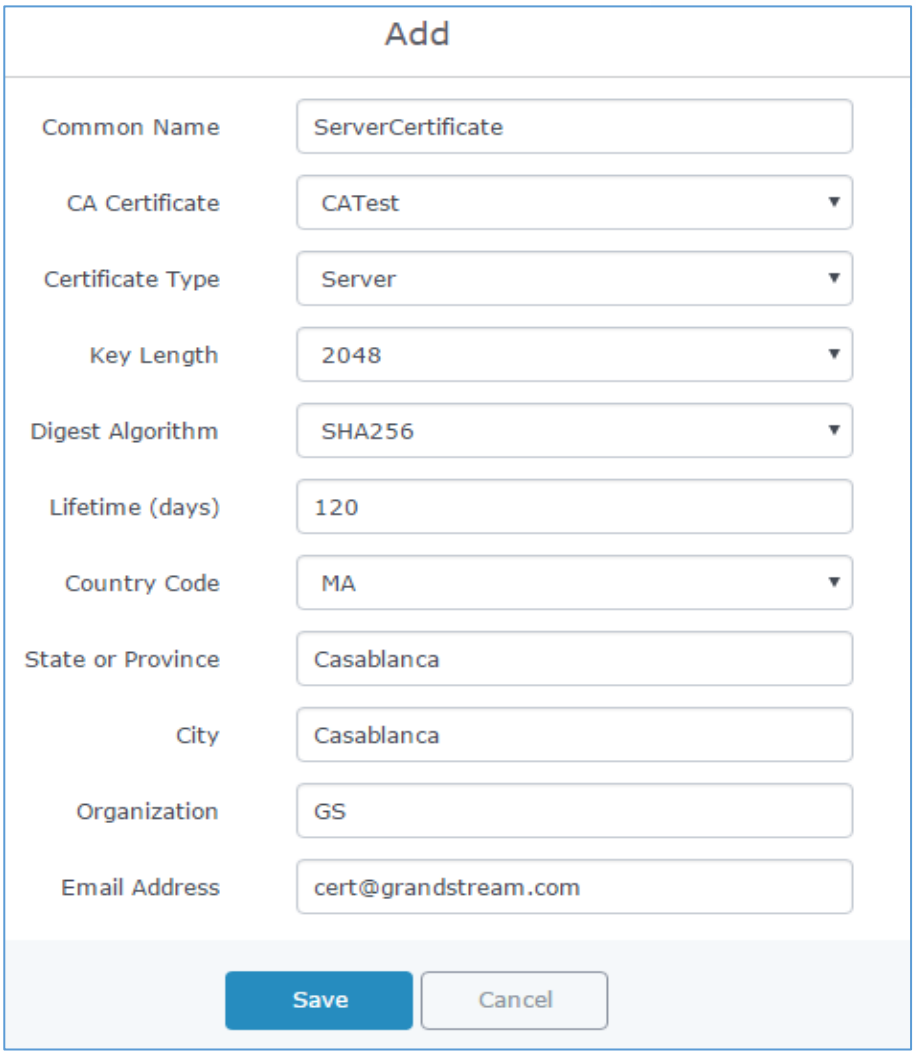


Figure 29: Generate Server Certificates

Table 20: Server Certificate

Field	Description
Common Name	Enter the common name for the server certificate. It could be any name to identify this certificate. Example: “ServerCertificate”.
CA Certificate	Select CA certificate previously generated from the drop down list. Example: “CATest”.
Certificate Type	Choose the certificate type from the drop down list. It can be either a client or a server certificate. Choose “Server” to generate server certificate.

Key Length	Choose the key length for generating the server certificate. Following values are available: • **1024**: 1024-bit keys are no longer sufficient to protect against attacks. Not recommended. • **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. • **SHA-256:** This digest algorithm generates an almost-unique, fixed size 256-bit (32-byte) hash. Hash is a one-way function – it cannot be decrypted back
Lifetime (days)	Enter the validity date for the server certificate in days. In our example, set to “120”.
Country Code	Select a country code from the dropdown list. Example: “MA”.
State or Province	Enter a state name or province. Example: “Casablanca”.
City	Enter a city name. Example: “Casablanca”.
Organization	Enter the organization name. Example: “GS”.
Email Address	Enter an email address. Example: “Cert@grandstream.com”.

3. Click on Save button after completing all the fields for the server certificate.

Click on  button to export the server certificate file in “.crt” format.

Click on  button to export the server key file in “. key” format.

Click on button to revoke the server certificate if no longer needed.

Notes:

- The server certificates (.crt and .key) will be used by the GWN7000 when acting as a server.
- The server certificates (.crt and .key) can be exported and used on another OpenVPN® server.

❖ Creating Client Certificate

To create client certificate, follow below steps:

1- Create Users

a. Navigate to "System Settings > User Manager".

b. Click on Add button. The following window will pop up.

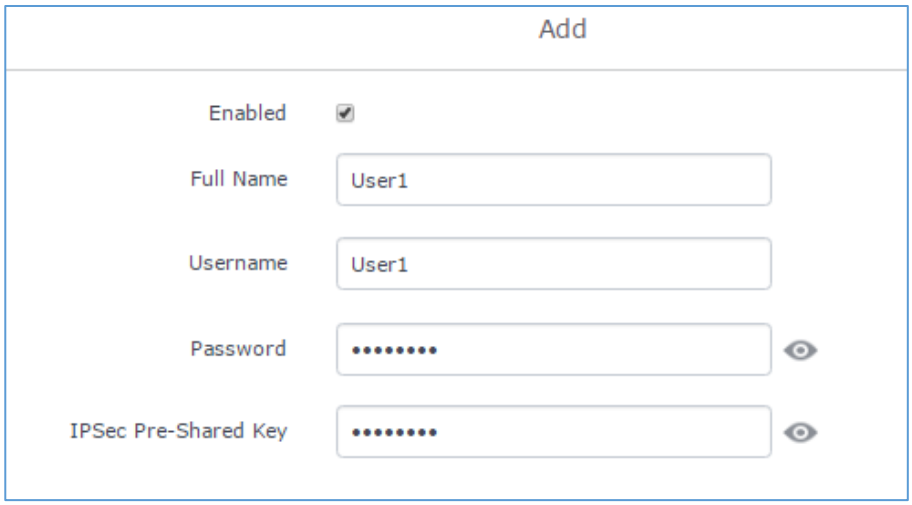


Figure 30: User Management

c. Enter User information based on below descriptions.

Field	Description
Enabled	Check to enable the user.
Full Name	Choose full name to identify the users.
Username	Choose username to distinguish client's certificate.

Password	Enter user password for each username.
IPSec Pre-Shared Key	Enter the pre-shared key to connect to VPN server. This field is used when clients are using pre-shared key.

d. Repeat above steps for each user.

2- Create Client Certificate

a. Navigate under "**System Settings -> Cert. Manager -> Certificates**".

b. Click on 

button. The following window will pop up.

c. Enter client certificate information based on below descriptions.

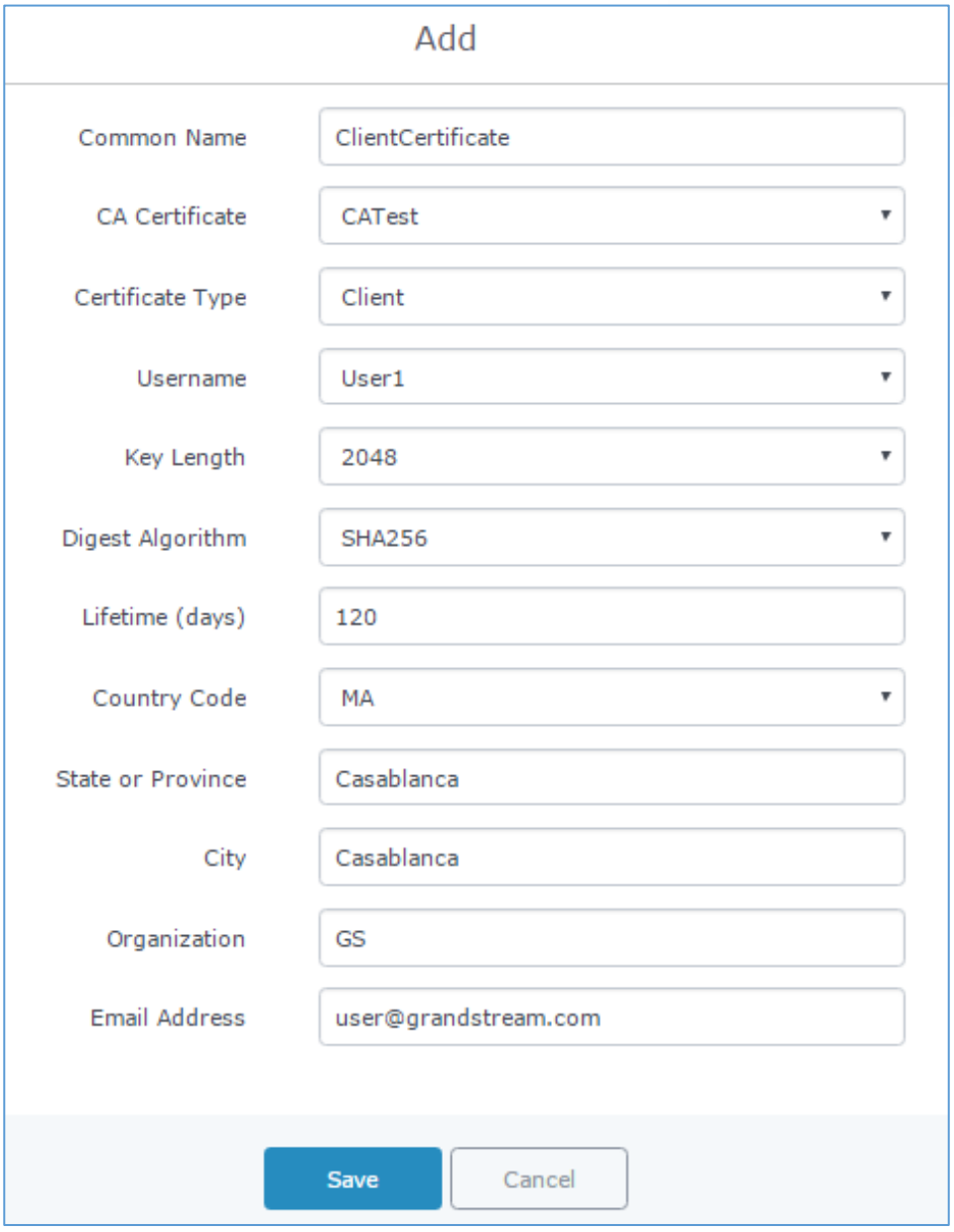


Figure 31: Client Certificat

Table 21: Client Certificat

Field	Description
Common Name	Enter the common name for the client certificate. It could be any name to identify this certificate. Example: “ClientCertificate”.
CA Certificate	Select the generated CA certificate from the drop down list.

Certificate Type	Choose the certificate type from the drop down list. It can be either a client or server certificate.
Username	Select created user to generate his certificate.
Key Length	Choose the key length for generating the client certificate. Following values are available: • **1024**: 1024-bit keys are no longer sufficient to protect against attacks. Not recommended. • **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. • **SHA-256:** This digest algorithm generates an almost-unique, fixed size 256-bit (32-byte) hash. Hash is a one-way function – it cannot be decrypted back
Lifetime (days)	Enter the validity date for the client certificate in days. Example: “120”.
Country Code	Select a country code from the dropdown list. Example: “MA”.
State or Province	Enter a state name or province. Example: “Casablanca”.
City	Enter a city name. Example: “Casablanca”.
Organization	Enter the organization name. Example: “GS”.
Email Address	Enter an email address. Example: “user@grandstream.com”.

d. Click on 

after completing all the fields for the client certificate.

e. Click on  to export the client certificate file in ".crt" format.

f. Click on  to export the client key file in ".key" format.

Click on  to revoke the client certificate if no longer needed.

The client certificates (".crt" and ".key") will be used by clients connected to the GWN7000 in order to establish TLS handshake.

Notes:

- Client certificates generated from the GWN7000 need to be uploaded to the clients.
- For security improvement, each client needs to have his own username and certificate, this way even if a user is compromised, other users will not be affected.

Create OpenVPN® Server

Once client and server certificates are successfully created, you can create a new server, so that clients can be connected to it, by navigating under "VPN > OpenVPN® > Server".

To create a new VPN server, follow below steps:

1. Click on 

and the following window will pop up.

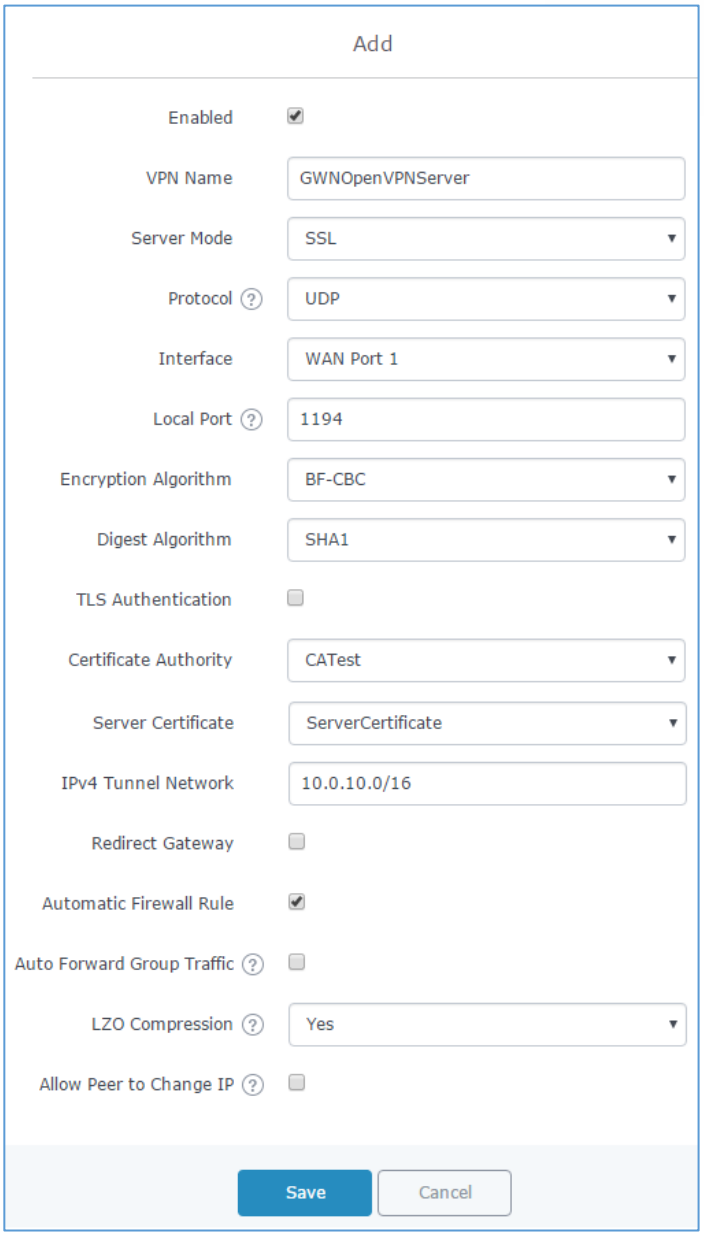


Figure 32: Create OpenVPN® Server

Table 22: OpenVPN® Server

Field	Description
Enable	Click on the checkbox in order to enable the OpenVPN® server feature.
VPN Name	Enter a name for the OpenVPN® server.
Server Mode	Choose the server mode the OpenVPN® server will operate with.

	4 modes are available: • **PSK:** used to establish a point-to-point OpenVPN® configuration. A VPN tunnel will be created with a server endpoint of a specified IP and a client endpoint of specified IP. Encrypted communication between client and server will occur over UDP port 1194, the default OpenVPN® port. • **SSL:** Authentication is made using certificates only (no user/pass authentication). Each user has a unique client configuration that includes their personal certificate and key. This is useful if clients should not be prompted to enter a username and password, but it is less secure as it relies only on something the user has (TLS key and certificate). • **User Auth:** Authentication is made using only CA, user and password, no certificates. Useful if the clients should not have individual certificates. Less secure as it relies on a shared TLS key plus only something the user knows (Username/password). • **SSL + User Auth:** Requires both certificate and username / password. Each user has a unique client configuration that includes their personal certificate and key. Most secure, as there are multiple factors of authentication (TLS Key and Certificate that the user has, and the username/password they know).
Protocol	Choose the Transport protocol from the dropdown list, either TCP or UDP. The default protocol is UDP.
Interface	Select the interface used to connect the GWN7000 to the uplink, either WAN1, WAN2 or All.
Local Port	Configure the listening port for OpenVPN® server. The default value is 1194.
Encryption Algorithm	Choose the encryption algorithm from the drop down list, in order to encrypt data so that the receiver can decrypt it using same algorithm.
Digest Algorithm	Choose the digest algorithm from the drop down 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 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 Pre-Shared Key	Enter the generated TLS Pre-Shared Key when using TLS Authentication.
Certificate Authority	Select a generated CA from the drop down list.
Server Certificate	Select a generated Server Certificate from the drop down list.
IPv4 Tunnel Network	Enter the network range that the GWN7000 will be serving from to the OpenVPN® client. **Note:** The network format should be the following **10.0.10.0/16**. The mask should be at least 16 bits.
Redirect Gateway	When redirect-gateway is used, OpenVPN® clients will route DNS queries through the VPN, and the VPN server will need to handle them.
Automatic Firewall Rule	Enable automatic firewall rule.
Auto Forward Group Traffic	If enabled, choose which groups you want to forward, if not, you can manually configure the forward rules under firewall settings.
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.
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.

2. Click Save after completing all the fields.
3. Click Apply on top of the WebGUI in order to apply changes.

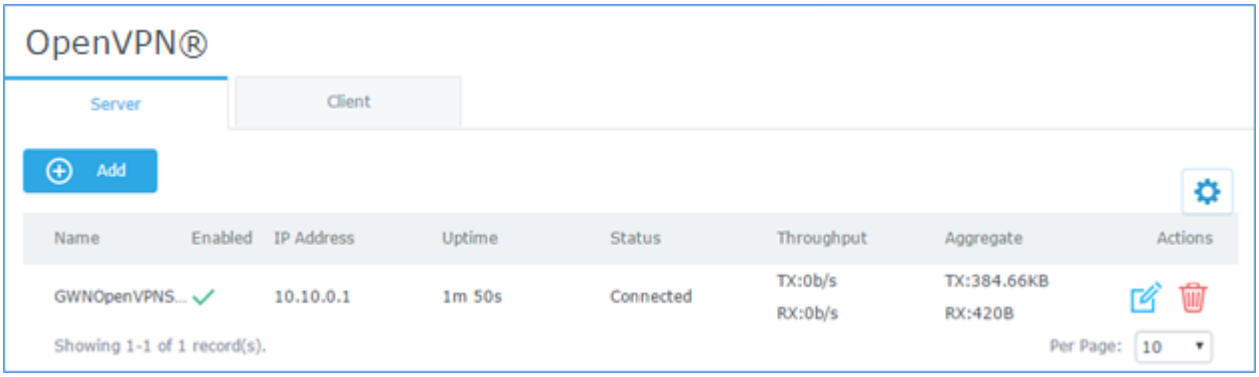


Figure 33: OpenVPN®

OpenVPN® Client configuration

The GWN7000 act as both, an OpenVPN® client and server, once users and **client certificate** created, navigate under "**VPN > OpenVPN® > Client**" and follow steps below:

1. Click on 

and the following window will pop up.

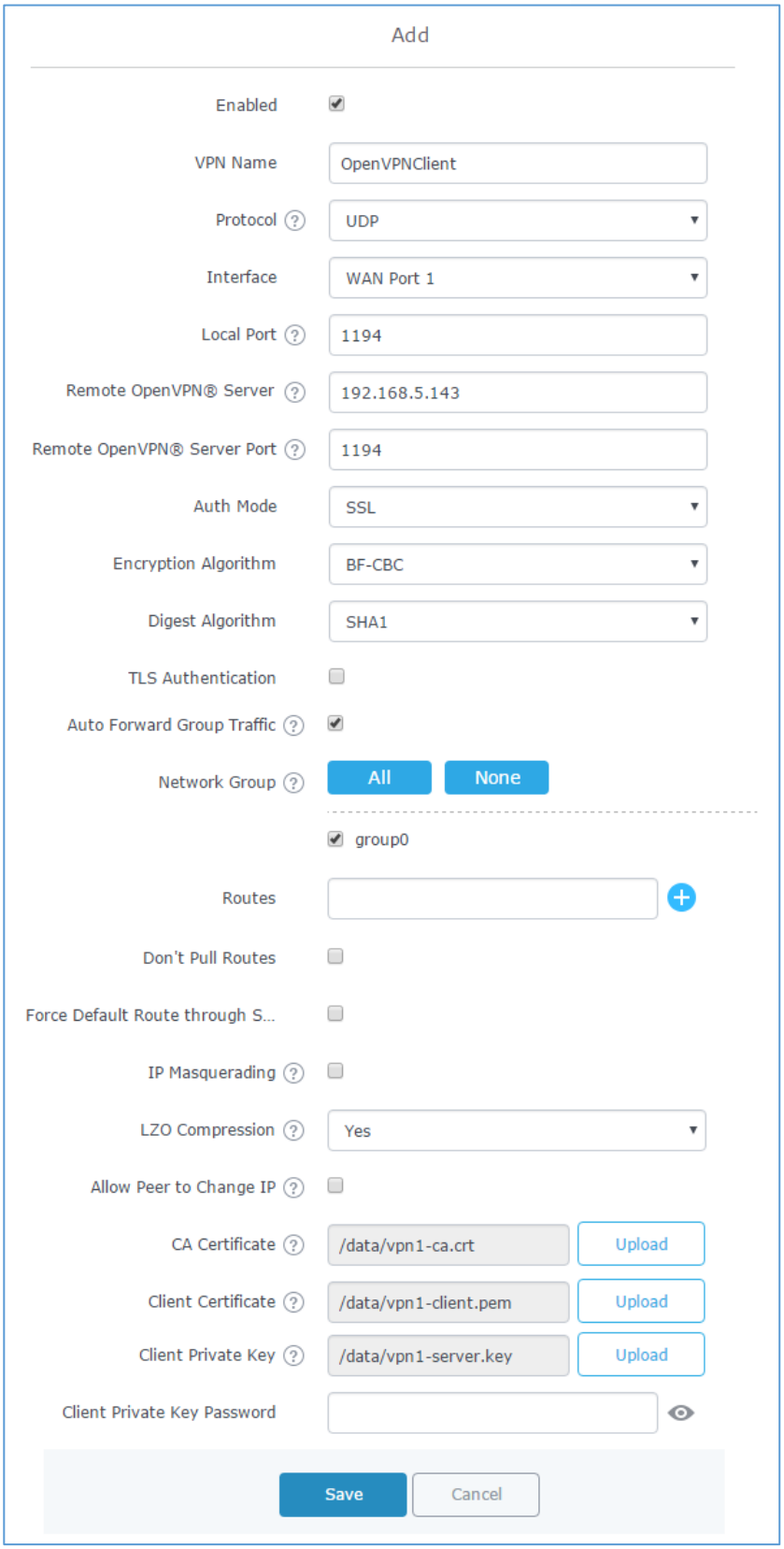


Figure 34: OpenVPN® Client

Table 23: OpenVPN® Client

Field	Description
Enable	Click on the checkbox to enable the OpenVPN® client feature.
VPN Name	Enter a name for the OpenVPN® client.
Protocol	Choose the Transport protocol from the dropdown list, either TCP or UDP. The default protocol is UDP.
Interface	Select the interface used to connect the GWN7000 to the uplink, either WAN1, WAN2 or All.
Local Port	Configure the listening port for OpenVPN® server. Default is 1194.
Remote OpenVPN® Server	Configure the remote OpenVPN® server IP address.
Remote OpenVPN® Server Port	Configure the remote OpenVPN® server port.
Auth Mode	Choose the server mode the OpenVPN® server will operate with, 4 modes are available: • **PSK:** used to establish a point-to-point OpenVPN® configuration. A VPN tunnel will be created with a server endpoint of a specified IP and a client endpoint of specified IP. Encrypted communication between client and server will occur over UDP port 1194, the default OpenVPN® port. • **SSL:** Authentication is made using certificates only (no user/pass authentication). Each user has a unique client configuration that includes their personal certificate and key. This is useful if clients should not be prompted to enter a username and password, but it is less secure as it relies only on something the user has (TLS key and certificate). • **User Auth:** Authentication is made using only CA, user and password, no certificates. Useful if the clients should not have individual certificates. Less secure as it relies on a shared TLS key plus only something the user knows (Username/password). • **SSL + User Auth:** Requires both certificate and username / password. Each user has a unique client configuration that includes their personal certificate and key. Most secure, as there are multiple factors of authentication (TLS Key and Certificate that the user has, and the username/password they know).

Encryption Algorithm	Choose the encryption algorithm from the drop down list, in order to encrypt data so that the receiver can decrypt it using the same algorithm.
Digest Algorithm	Choose the digest algorithm from the drop down 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 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 Pre-Shared Key	Enter the generated TLS Pre-Shared Key when using TLS Authentication.
Auto Forward Group Traffic	If enabled, choose which groups you want to forward, if not, you can manually configure the forward rules under firewall settings.
Network Group	Select the Network group to which the client belongs, or select All Network Groups.
Routes	This feature allows specifying and adding custom routes.
Don't Pull Routes	If enabled, client will ignore routes pushed by the server.
Force Default Route through Server	Force a default route to 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	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 Certificate	Click on "Upload" and select the "CA" certificate generated previously on this guide.
Client Certificate	Click on "Upload" and select the "Client Certificate" generated previously on this guide.

Client Private Key	Click on “Upload” and select the “Client Private Key” generated previously on this guide.
Client Private Key Password	Enter the client private key password

2. Click Save after completing all the fields.
3. Click Apply on top of the webGUI in order to apply changes.

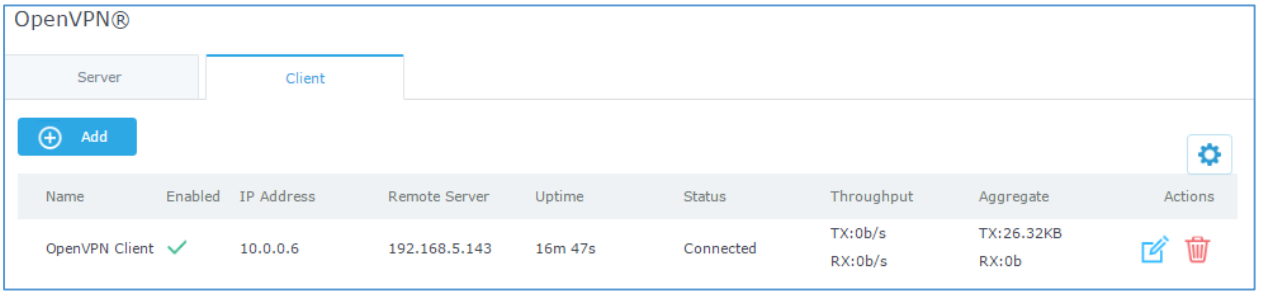


Figure 35: OpenVPN® Client

L2TP/IPSEC Configuration

Layer 2 Tunneling Protocol (L2TP) is a tunneling protocol used to support virtual private networks (VPNs) or as part of the delivery of services by ISPs. It does not provide any encryption or confidentiality by itself. Rather, it relies on an encryption protocol that it passes within the tunnel to provide privacy.

GWN7000 L2TP/IPSec Client Configuration

To configure L2TP client on the GWN7000, navigate under “**VPN -> L2TP/IPSec**” and set the following:

1- Click on Add and the following window will pop up.

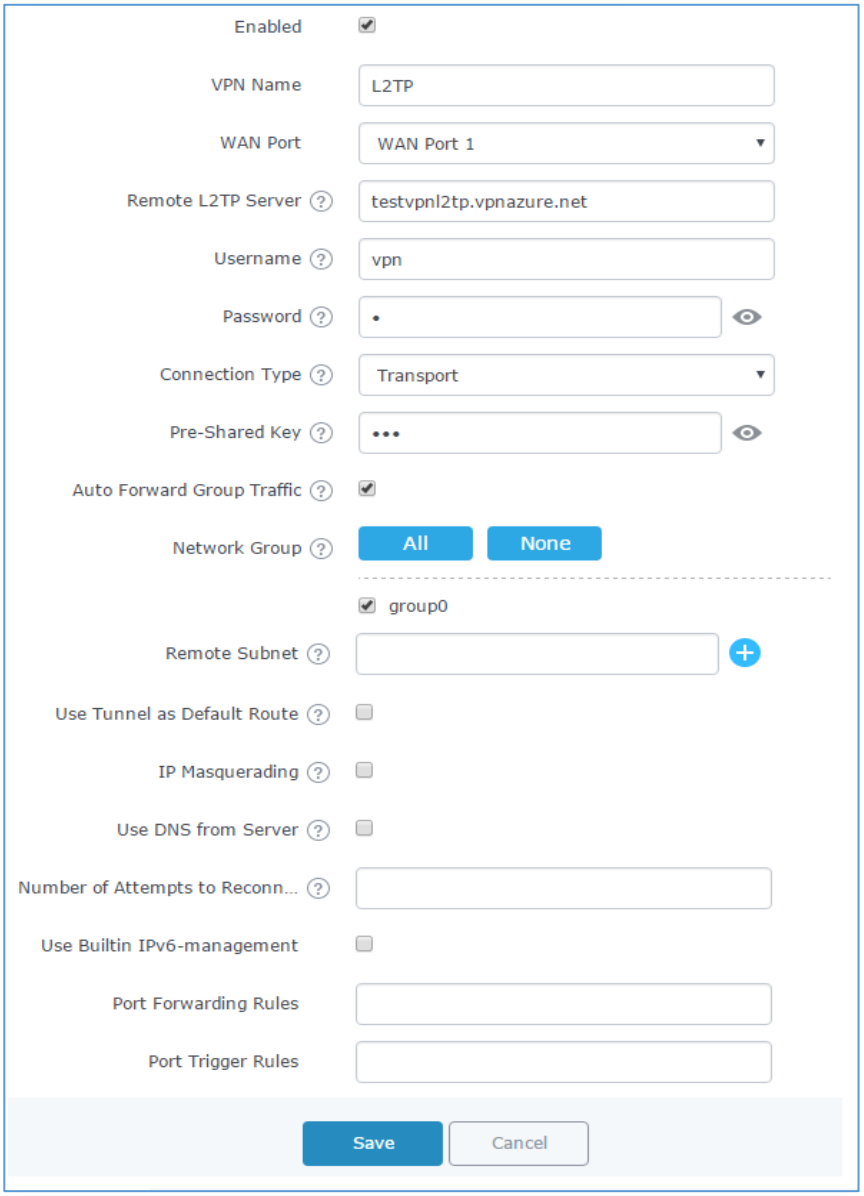


Figure 36: L2TP Client Configuration

Table 24: L2TP Configuration

Field	Description
Enable	Click on the checkbox in order to enable the L2TP client feature.
VPN Name	Enter a name for the L2TP client.
WAN Port	Select which WAN port is connected to the uplink, either WAN1 or WAN2.
Remote L2TP Server	Enter the IP/Domain of the remote L2TP Server.
Username	Enter the Username for authentication against the VPN Server.

Password	Enter the Password for authentication against the VPN Server.
Connection Type	Select either Transport mode or Tunnel mode: • **Transport mode** is commonly used between end stations or between an end station and a gateway, if the gateway is being treated as a host. • **Tunnel mode** is used between gateways, or at an end station to a gateway, the gateway acting as a proxy for the hosts behind it.
Pre-Shared Key	Enter the L2TP pre-shared key.
Auto Forward Group Traffic	If enabled, choose which groups you want to forward, if not, you can manually configure the forward rules under firewall settings.
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. For example: 192.168.5.0/24
Use Tunnel as Default Route	Enable this option so that L2TP/IPSec VPN Tunnel will be used by default.
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.
Use DNS from Server	Enable this option to retrieve DNS from the VPN server.
Number of Attempts to Reconnect	Configures the number of attempts to reconnect the L2TP client, if this number is exceeded, the client will be disconnected from the L2TP/IP Server.
Use Built-in IPv6 management	Enable the IPv6 management for the VPN.
Port Forwarding Rules	Enter the port-forwarding rule to be used for the VPN.
Port Trigger Rules	Enter the port trigger rule to be used for the VPN.

2- Click Save after completing all the fields.

3- Click Apply on top of the web GUI to apply changes.

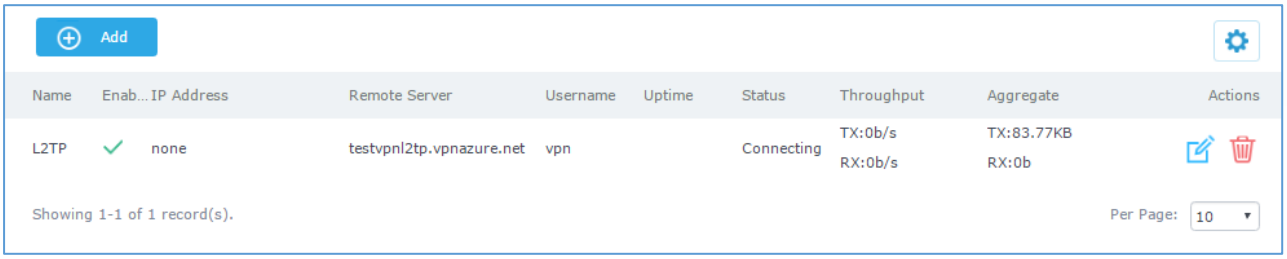


Figure 37: L2TP Client

PPTP CONFIGURATION

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

GWN7000 Client Configuration

To configure PPTP client on the GWN7000, navigate under "**VPN -> PPTP**" and set the following:

1- Click on 

and the following window will pop up.

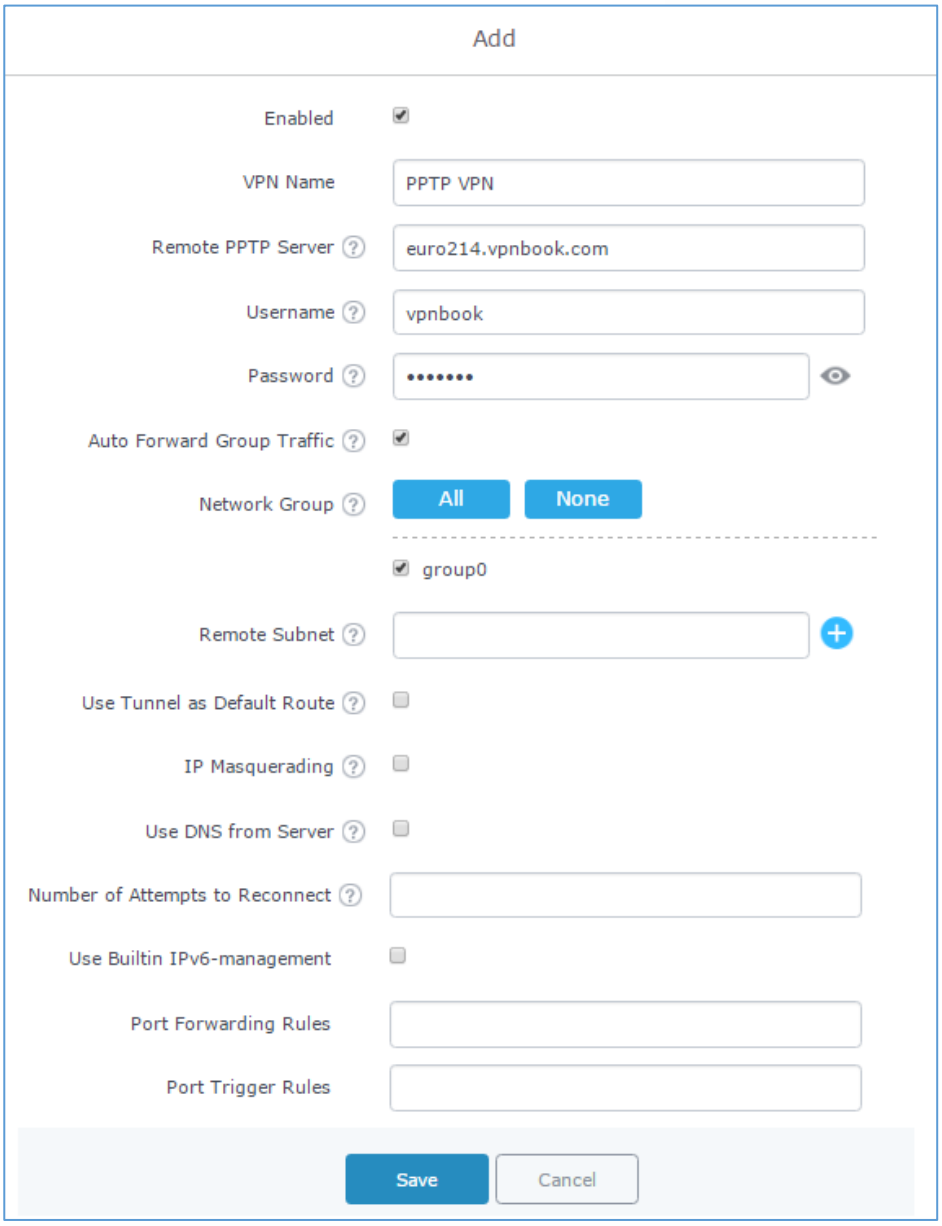


Figure 38: PPTP Client Configuration

Table 25: PPTP Configuration

Field	Description
Enable	Click on the checkbox to enable the PPTP VPN client feature.
VPN Name	Enter a name for the PPTP client.
Remote PPTP Server	Enter the IP/Domain of the remote PPTP Server.
Username	Enter the Username for authentication against the VPN Server.
Password	Enter the Password for authentication against the VPN Server.

Auto Forward Group Traffic	If enabled, choose which groups you want to forward, if not, you can manually configure the forward rules under firewall settings.
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. For example: 192.168.5.0/24
Use Tunnel as Default Route	Enable this option so that PPTP VPN Tunnel will be used by default.
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.
Use DNS from Server	Enable this option to retrieve DNS from the VPN server.
Number of Attempts to Reconnect	Configures the number of attempts to reconnect the PPTP client, if this number is exceeded, the client will be disconnected from the PPTP Server.
Use Built-in IPv6 management	Enable the IPv6 management for the VPN.
Port Forwarding Rules	Enter the port-forwarding rule to be used for the VPN.
Port Trigger Rules	Enter the port trigger rule to be used for the VPN.

2- Click Save after completing all the fields.

3- Click Apply on top of the webGUI to apply changes.

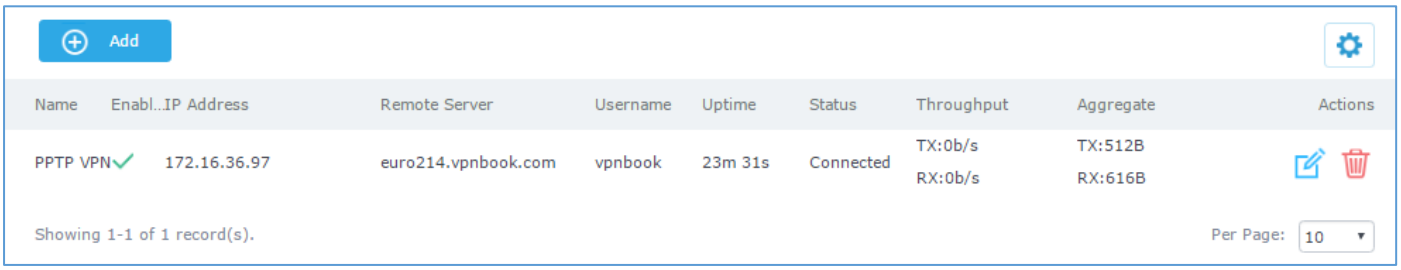


Figure 39: PPTP Client

FIREWALL

GWN7000 supports firewall feature to control incoming and outgoing traffic by restricting or rejecting specific traffic, as well as preventing attacks to the GWN7000 networks for enhanced security.

The Firewall feature includes 3 menus:

- **Basic Settings:** Used to enable SYN Flood, setup port forwarding, DMZ, inter-group traffic forwarding and UPnP.
- **Traffic Rules:** Used to control incoming/outgoing traffic in customized scheduled times, and taking actions for specified rules such as Accept; Reject and Drop.
- **Advanced:** Used to setup SNAT and DNAT.

Basic Settings

General Settings

SYN Flood Protection is used to avoid DOS attacks.
SYN Flood Protection is enabled by default on GWN7000, you can edit the “SYN Flood Rate Limit”, “SYN Flood Burst Limit” and whether to drop or no the invalid packets as shown in the below screenshot

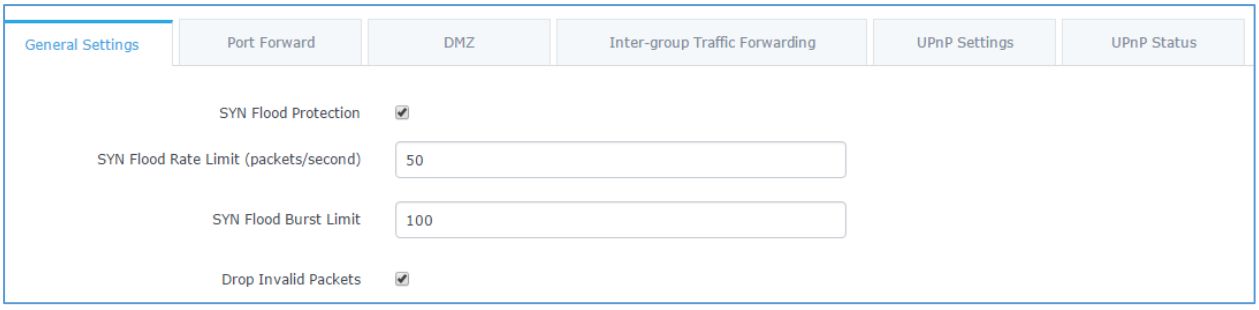


Figure 40: Basic->General Settings

Port Forwarding

Port forwarding allows redirecting a communication request from one address and port number combination to another.
Below are different possible actions:

- To add a Port Forward rule, click on 

.
- To edit a Port Forward rule, click on  .

- To delete a Port Forward rule, click on  .

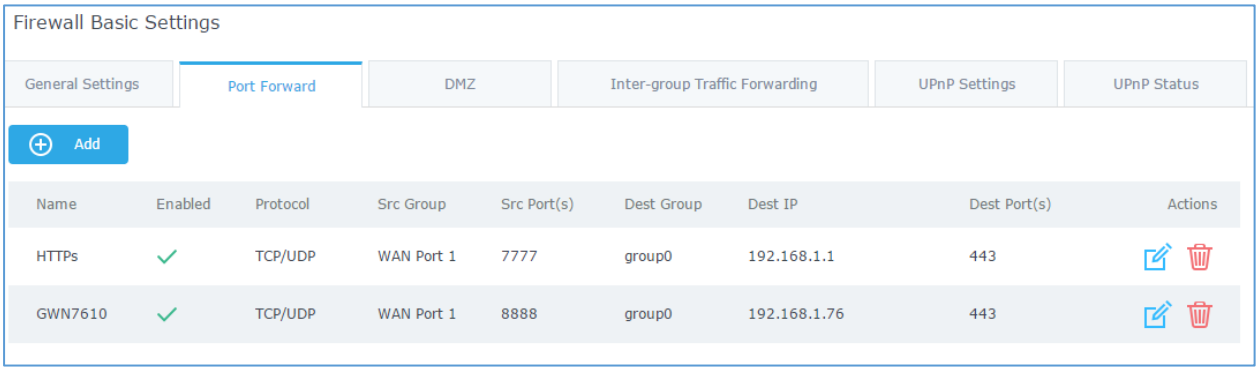


Figure 41: Port Forward

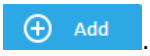
Refer to following table for Port Forwarding option when editing or creating a port-forwarding rule:

Table 26: Port Forward

Name	Specify a name for the port forward rule.
Enabled	Check to enable this port forward rule.
Protocol	Select a protocol, users can select TCP, UDP or TCP/UDP.
Source Group	Select the WAN Interface.
Source Port	Set the Source Port number.
Destination Group	Select the LAN group.
Destination IP	Set the destination IP address.
Destination Port	Set the Destination Port number.

DMZ

GWN7000 support DMZ, where it is possible to specify a LAN client to be put on the DMZ.

- To add an IP into the DMZ, click on  .
- To edit a DMZ entry, click on  .
- To delete a DMZ entry, click on  .

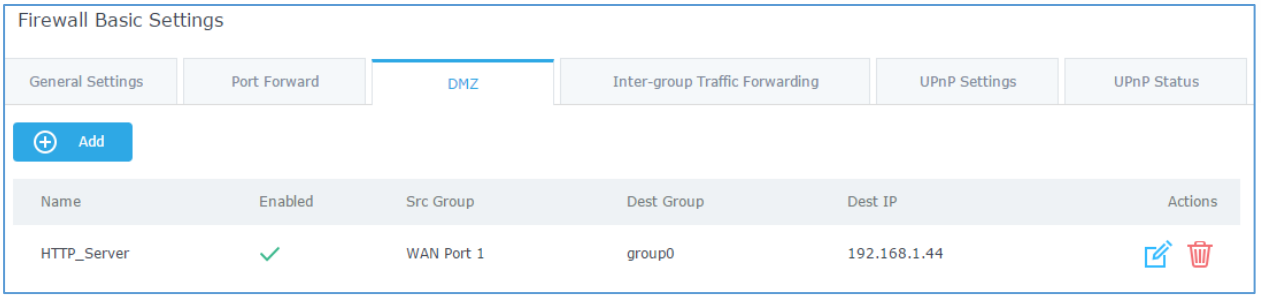


Figure 42: DMZ

Refer to below table for DMZ fields:

Table 27: DMZ

Name	Specify a name for the DMZ entry.
Enabled	Check to enable this DMZ entry.
Source Group	Select the WAN interface
Destination Group	Select the LAN group.
Destination IP	Set the destination IP address.

Inter-Group Traffic Forwarding

GWN7000 offers the possibility to allow traffic between different groups and interfaces.
Users can select to edit a source group and add to it other network groups and WAN interfaces to allow inter-group traffic between the selected members.

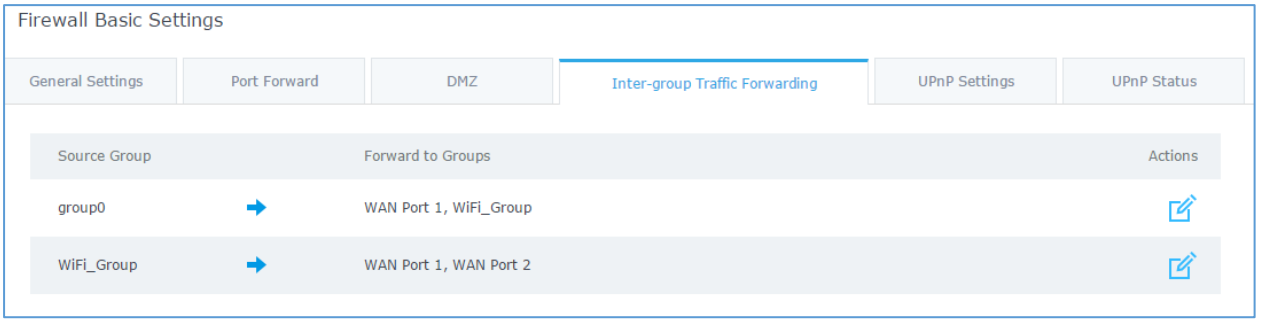


Figure 43: Inter-group Traffic Forwarding

Click on  next to source group, and click on  to add groups and interfaces to selected groups, or click on  to remove members from selected groups as shown in below figure

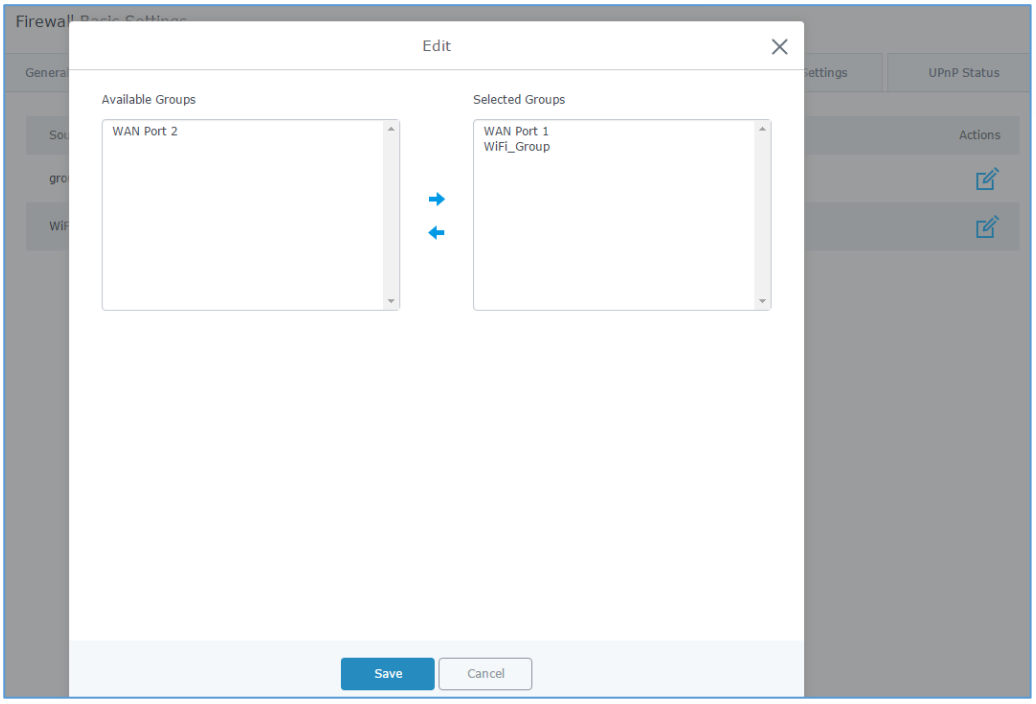


Figure 44: Enabling inter-group traffic

UPnP

GWN7000 supports UPnP that enables programs running on a host to configure automatically port forwarding.

UPnP allows a program to make the GWN7000 to open necessary ports, without any intervention from the user, without making any check.

UPnP settings can be accessed from GWN7000 WebGUI->**Firewall->Basic->UPnP Settings**.

Refer to below Table for UPnP settings.

Table 28: UPnP Settings

Enable Daemon	Check to enable Daemon for UPnP.
External Interface	Select the WAN interface to allow external connection to resources that enables UPnP.
Internal Interface	Check the LAN network group on which to activate UPnP.
Enable UPnP	Check to Enable UPnP for the LAN clients on selected network group.
Enable NAT-PMP	Check to enable automatic NAT Port Mapping (NAT-PMP).
Secure Mode	Check to activate secure mode for devices that activate UPnP.
Logging to Syslog	Choose whether to log activities for UPnP into Syslog.
Download Speed	Set the Download speed value in KB/s. Default is 2048
Upload Speed	Set the Upload speed value in KB/s. Default is 1024.

Traffic Rules Settings

GWN7000 offers the possibility to fully control incoming/outgoing traffic for different protocols in customized scheduled times, and taking actions for specified rules such as Accept; Reject and Drop.

Following actions are available to configure Input, output and forward rules for configured protocols

- To add new rule, Click on Add.
- To edit a rule, Click on
- To delete a rule, Click on .

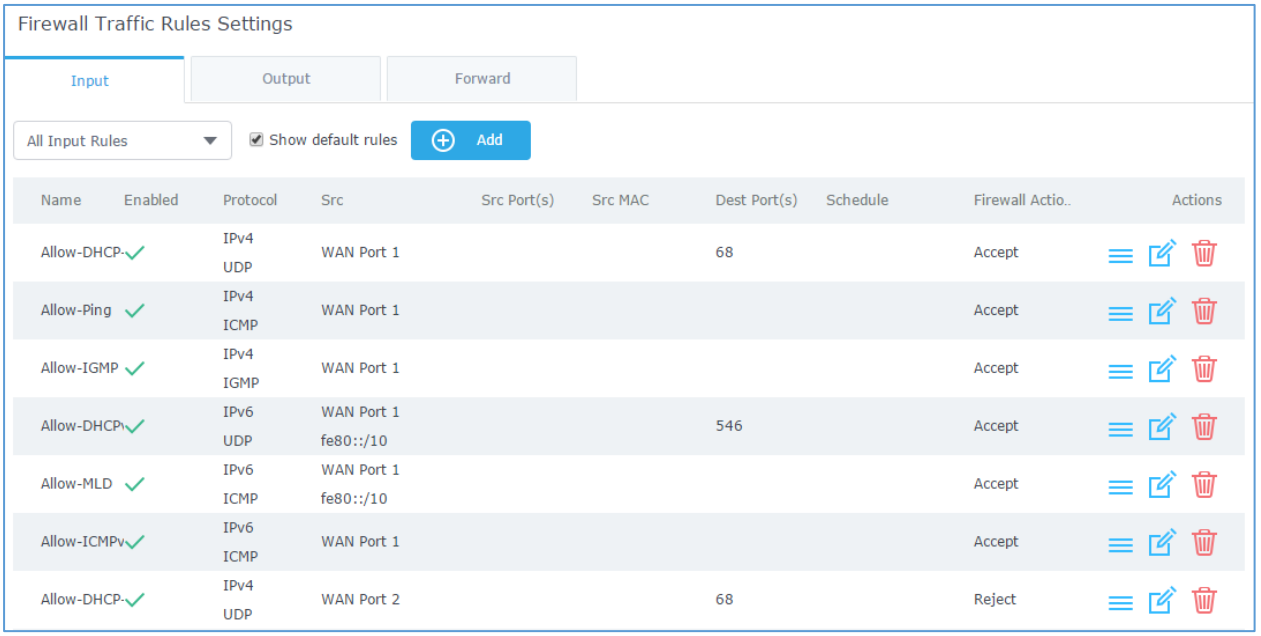


Figure 45: Traffic Rules Settings

Refer to below table for each tab, when editing or creating a traffic rule:

Table 29: Firewall Traffic Rules

Name	Specify a name for the traffic rule.
Enabled	Check to enable this rule.
IP Family	Select the IP version, three options are available: IPv4, IPv6 or Any.
Source Group	Select a WAN interface or a LAN group for Source Group, or select All.
Protocol	Select one of the protocols from dropdown list or All, available options are: UDP, TCP, TCP/UCP, UDP-Lite, ICMP, AH, SCTP, IGMP and All.
Source IP Address	Set the Source IP address, it can be an IPv4 or IPv6 address.
Source MAC address	Set the Source MAC address.

Schedule Start Date	Click on  icon to schedule a start date for this rule to be applied.
Schedule End Date	Click on  icon to schedule an end date for this rule to cease effect.
Schedule Start Time	Click on  icon to schedule a start time for this rule to be applied.
Schedule End Time	Click on  icon to schedule an end time for this rule to cease effect.
Schedule Weekdays List of Weekdays	Select the days, on which the traffic rule will be applied, the unselected days will ignore this rule.
Schedule Days of the Month	Enter the days of the months (separated by space) on which the traffic rule will be applied. Example: 5 10 15 This will be applied only on 5th, 10th and 15th day monthly.
Treat Time Values as UTC Instead of Local Time	Check to use UTC as time zone for the specified times, instead of using GWN7000's local time.
Firewall Action	Select which action to perform for the given traffic rule, 3 options are available: Accept, Reject or Drop.

Firewall Advanced Settings

Firewall Advanced Settings page provides the ability to setup input/output policies for each WAN interface and LAN groups; as well as setting configuration for Static and Dynamic NAT.

General Settings

Click on  next to a WAN interface or Network group to edit its input and output policies.

Refer to below table for general settings options

Table 30: Firewall-General Settings

Input Policy	Select which action to apply to all incoming traffic to this interface/LAN group, 3 actions are available: Accept, Reject and Drop.
Output Policy	Select which action to apply to all outgoing traffic from this interface/LAN group, 3 actions are available: Accept, Reject and Drop.
IP Masquerading	Check to enable IP Masquerading, this will allow 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.

MSS Clamping	Check to enable MSS Clamping. This will provide a method to prevent fragmentation when the MTU value on the communication path is lower than the MSS value.
Log Dropped and Reject Traffic to Syslog	Check to send all rejected and dropped traffic logs to configured Syslog Server.
Limit for Dropped and Rejected Traffic	Specify the limit for dropped and reject traffic. The value format is N/unit, where N is a digit number, and unit can either be in second, minute, hour or day.

SNAT

Following actions are available for SNAT.

- To add new SNAT entry, click on 

.
- To edit a SNAT entry, click on  .
- To delete a SNAT rule, click on  .

Refer to below table when creating or editing an SNAT entry

Table 31: SNAT

Name	Specify a name for the SNAT entry
Enabled	Check to enable this SNAT entry.
IP Family	Select the IP version, three options are available: IPv4, IPv6 or Any.
Source Group	Select a WAN interface or a LAN group for Source Group, or select All.
Destination Group	Select a WAN interface or a LAN group for Destination Group, or select All. Make sure that destination and source groups are different to avoid conflict.
Protocol	Select one of the protocols from dropdown list or All, available options are: UDP, TCP, TCP/UCP and All.
Source IP	Set the Source IP address.
Rewrite IP	Set the Rewrite IP. The source IP address of the data package from the source group will be updated to this configured IP.
Destination IP	Set the Destination IP address.
Schedule Start Date	Click on  icon to schedule a start date for this SNAT entry to be applied.
Schedule End Date	Click on  icon to schedule an end date for this SNAT entry to end.

Schedule Start Time	Click on icon to schedule a start time for this SNAT entry to be applied.
Schedule End Time	Click on icon to schedule an end time for this SNAT entry to end.
Schedule Weekdays List of Weekdays	Select the days, on which the SNAT entry will be applied, the unselected days will ignore this rule.
Schedule Days of the Month	Enter the days of the months (separated by space) on which the SNAT entry will be applied. Example: 5 10 15 This will be applied only on 5th, 10th and 15th day monthly.
Treat Time Values as UTC Instead of Local Time	Check to use UTC as time zone for the specified times, instead of using GWN7000's local time.

DNAT

Following actions are available for DNAT:

- To add new DNAT entry, click on Add.
- To edit a DNAT entry, click on .
- To delete a DNAT rule, click on .

Refer to below table when creating or editing a DNAT entry:

Table 32: DNAT

Name	Specify a name for the DNAT entry
Enabled	Check to enable this DNAT entry.
IP Family	Select the IP version, three options are available: IPv4, IPv6 or Any.
Source Group	Select a WAN interface or a LAN group for Source Group, or select All.
Destination Group	Select a WAN interface or a LAN group for Destination Group, or select All. Make sure that destination and source groups are different to avoid conflict.
Protocol	Select one of the protocols from dropdown list or All, available options are: UDP, TCP, TCP/UCP and All.
Source IP	Set the Source IP address.
Rewrite IP	Set the Rewrite IP. The source IP address of the data package from the source group will be updated to this configured IP.
Destination IP	Set the Destination IP address.

Schedule Start Date	Click on  icon to schedule a start date for this DNAT entry to be applied.
Schedule End Date	Click on  icon to schedule an end date for this DNAT entry to end.
Schedule Start Time	Click on  icon to schedule a start time for this DNAT entry to be applied.
Schedule End Time	Click on  icon to schedule an end time for this DNAT entry to end.
Schedule Weekdays List of Weekdays	Select the days, on which the DNAT entry will be applied, the unselected days will ignore this rule.
Schedule Days of the Month	Enter the days of the months (separated by space) on which the DNAT entry will be applied. Example: 5 10 15 This will be applied only on 5th, 10th and 15th day monthly.
Treat Time Values as UTC Instead of Local Time	Check to use UTC as time zone for the specified times, instead of using GWN7000's local time.
Enable NAT Reflection	Check to enable NAT Reflection for this DNAT entry to allow the access of a service via the public IP address from inside the local network.

MAINTENANCE AND TROUBLESHOOTING

GWN7000 offers multiple tools and options for maintenance and debugging to help further troubleshooting and monitoring the GWN7000 resources.

Maintenance

Maintenance page can be accessed from GWN7000 WebGUI-> **System Settings-> Maintenance**.
Refer to below table for maintenance tabs and fields.

Table 33: Maintenance

Basic	
Country	Select the country from the drop-down list.
Time Zone	Configure time zone for the GWN7000. Please reboot the device to take effect.
NTP Server	Configure the IP address or URL of the NTP server, the device will obtain the date and time from the configured server.
Date Display Format	Change the Date Display Format, three options are possible YYYY/MM/DD, MM/DD/YYYY and DD/MM/YYYY
Upgrade	
Authenticate Config File	Authenticate configuration file before acceptance. Default is disabled.
XML Config File Password	Enter the password for encrypting the XML configuration file using OpenSSL. The password is used to decrypt the XML configuration file if it is encrypted via OpenSSL.
Upgrade Via	Specify uploading method for firmware and configuration. 3 options are available: HTTP, HTTPS and TFTP.
Firmware Server	Configure the IP address or URL for the firmware upgrade server.
Config Server	Configure the IP address or URL for the configuration file server.
Check Update on Boot	Choose whether to enable or disable automatic upgrade and provisioning after reboot. Default is disabled.
Automatic Upgrade Check Interval(m)	Specify the time period to check for firmware upgrade (in minutes).
Reboot	Click on Reboot button to reboot the device
Download Configuration	Click on Download to download the device's configuration file.
Upgrade Now	Click on Upgrade, to launch firmware/config file provisioning. Please make sure to Save and Apply changes before clicking on Upgrade.
Factory Reset	Click on Reset to restore the GWN7000 as well as all online GWN76xx units to factory default settings

Access	
Current Administrator Password	Enter the current administrator password
New Administrator Password	Change the current password. This field is case sensitive with a maximum length of 32 characters.
Confirm New Administrator Password	Enter the new administrator password one more time to confirm.
User Password	Configure the password for user-level Web GUI access. This field is case sensitive with a maximum length of 32 characters.
User Password Confirmation	Enter the new User password again to confirm.
Syslog	
Syslog Server	Enter the IP address or URL of Syslog server. Please reboot the GWN7000 to take effect.
Syslog Level	Select the level of Syslog, 5 levels are available: **None, Debug, Info, Warning** and **Error**. Please reboot the GWN7000 to take effect.

Debug

Many debugging tools are available on GWN7000's WebGUI to check the status and troubleshoot GWN7000's services and networks.
Debug page offers 4 tabs: Capture, Ping/Traceroute, Syslog and Nat Table.

Capture

This section is used to capture packet traces from the GWN7000 interfaces (WAN ports and network groups) for troubleshooting purpose or monitoring...
It is needed to plug an USB storage device to one of the USB ports on the back of the GWN7000.

Click on Start to start capturing on a certain device plugged to the USB port.

Click on Stop to stop the capture.

Click on List to show the captured files on a chosen device, and the capture files details will appear, click on Clear to delete all files, click on  next to a capture file to download it on a local folder, or click on  to delete it.

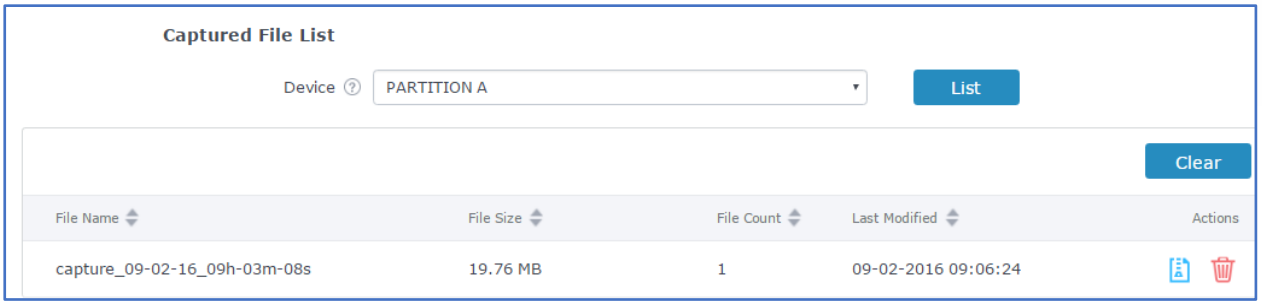


Figure 46: Capture Files

The below table will show different fields used on capture page

Table 34: Debug-Capture

File Name	Enter the name of the capture file that will be generated.
Interface	Choose an Interface (WAN port1 or 2, or a network group) from where to begin the capture.
Device	Choose a device plugged to USB port to save the capture once started.
File Size	Set a File size that the capture will not exceed (Optional field).
Rotate Count	Set a value for rotating captures (Optional Field).
Direction	Choose if you want to get all traffic or only outgoing or incoming to the choses interface.
Source Port	Set the Source Port to filter capture traffic coming from the defined source port.
Destination Port	Set the Destination Port to filter capture traffic coming from the defined port.
Source IP	Set the Source IP to filter capture traffic coming from the defined source IP.
Dest IP	Set the Destination IP to filter capture traffic coming from the defined destination IP.
Protocol	Choose ALL or a specific protocol to capture (IP, ARP, RARP, TCP, UDP, ICMP, IPv6)

Ping/Traceroute

Ping and Traceroute are useful debugging tools to verify reachability with other clients across the network (WAN or LAN). The GWN7000 offers both Ping and Traceroute tools for IPv4 and IPv6 protocols.

To use these tools, go to GWN7000 WebGUI->**System Settings->Debug** and click on **Ping/Traceroute.**

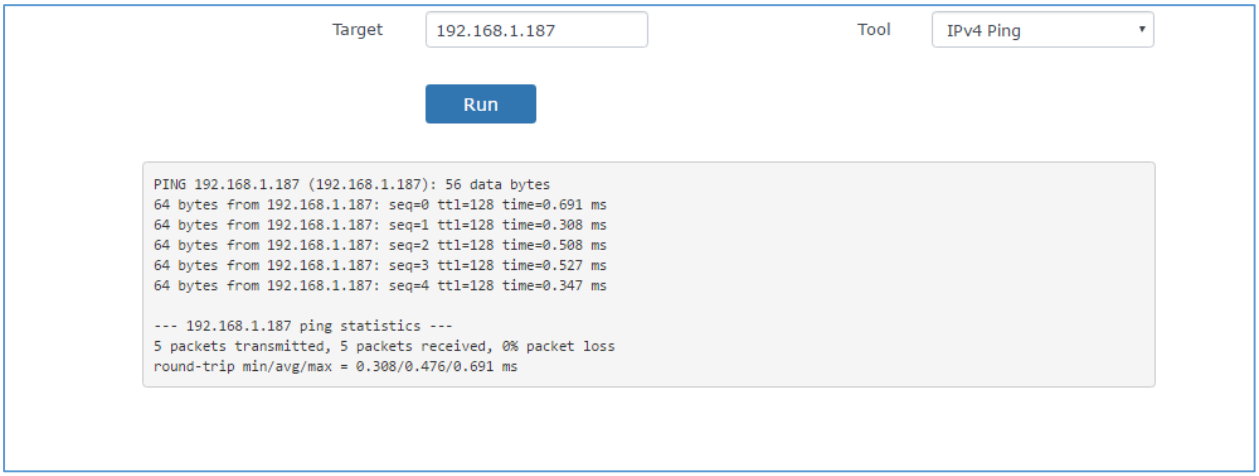


Figure 47: IP Ping

- Next to **Tool** choose from the dropdown menu:
  - IPv4 Ping for an IPv4 Ping test to Target
  - IPv6 Ping for an IPv6 Ping test to Target
  - IPv4 Traceroute for an IPv4 Traceroute to Target
  - IPv6 Traceroute for an IPv6 Traceroute to Target
- Type in the destination's IP address/domain name in **Target** field.
- Click on **Run**.

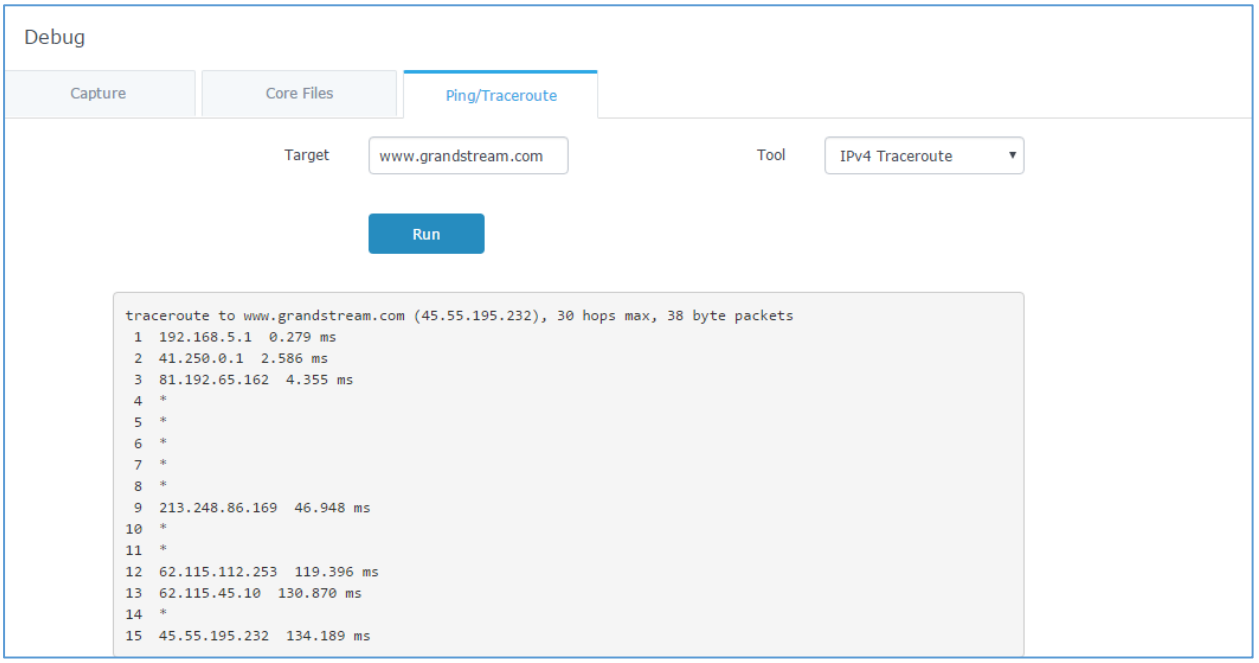


Figure 48: Traceroute

Syslog

GWN7000 supports dumping the syslog information to a remote server under Web GUI ->**System Settings->Maintenance->Syslog**.
Enter the syslog server hostname or IP address and select the level for the syslog information. Five levels of syslog are available: None, Debug, Info, Warning, and Error.

Syslog messages are also displayed in real time under Web GUI ->**System Settings->Debug->Syslog.**

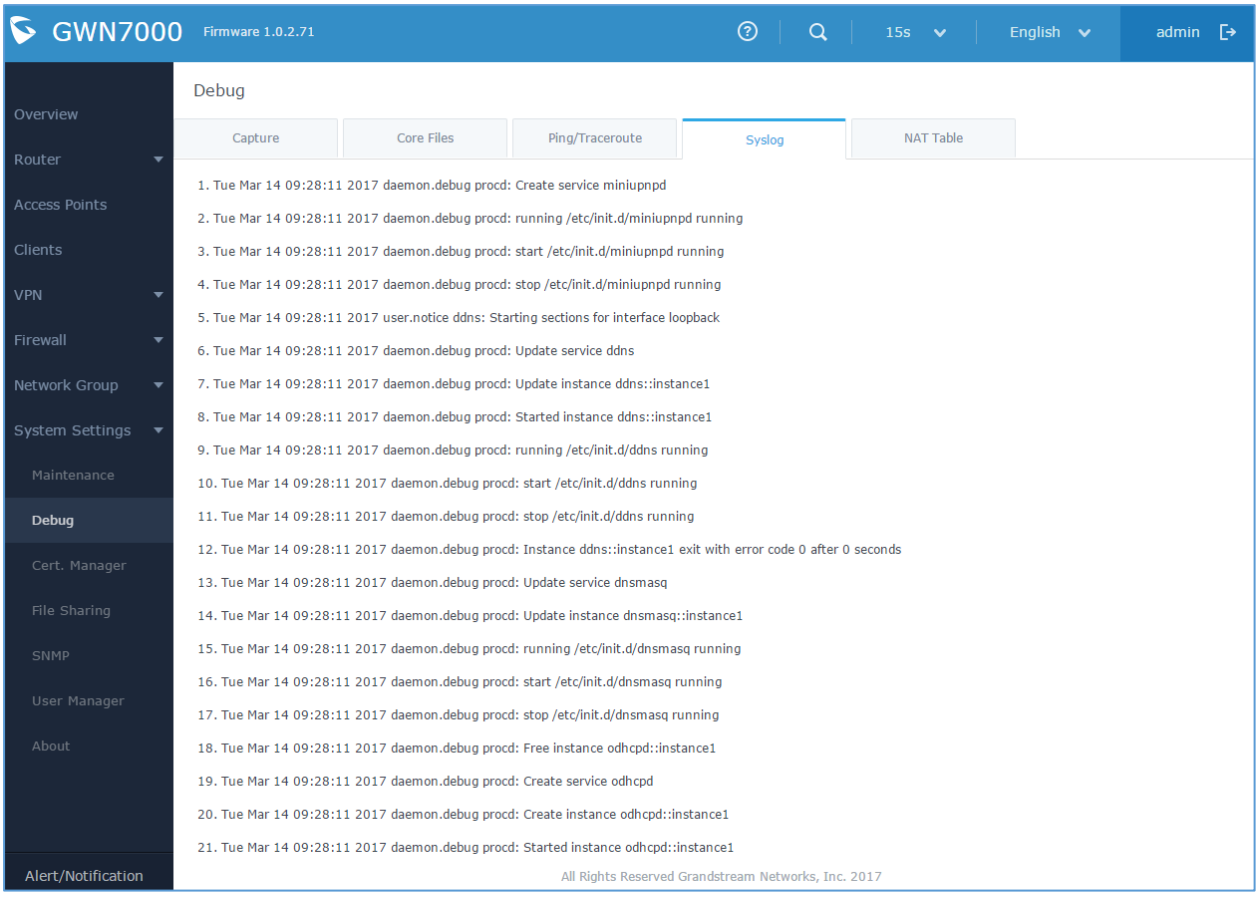


Figure 49: Syslog

NAT Table

NAT table is updated dynamically on GWN7000's WebGUI, to check the NAT table go to **System Settings->Debug->NAT Table**.

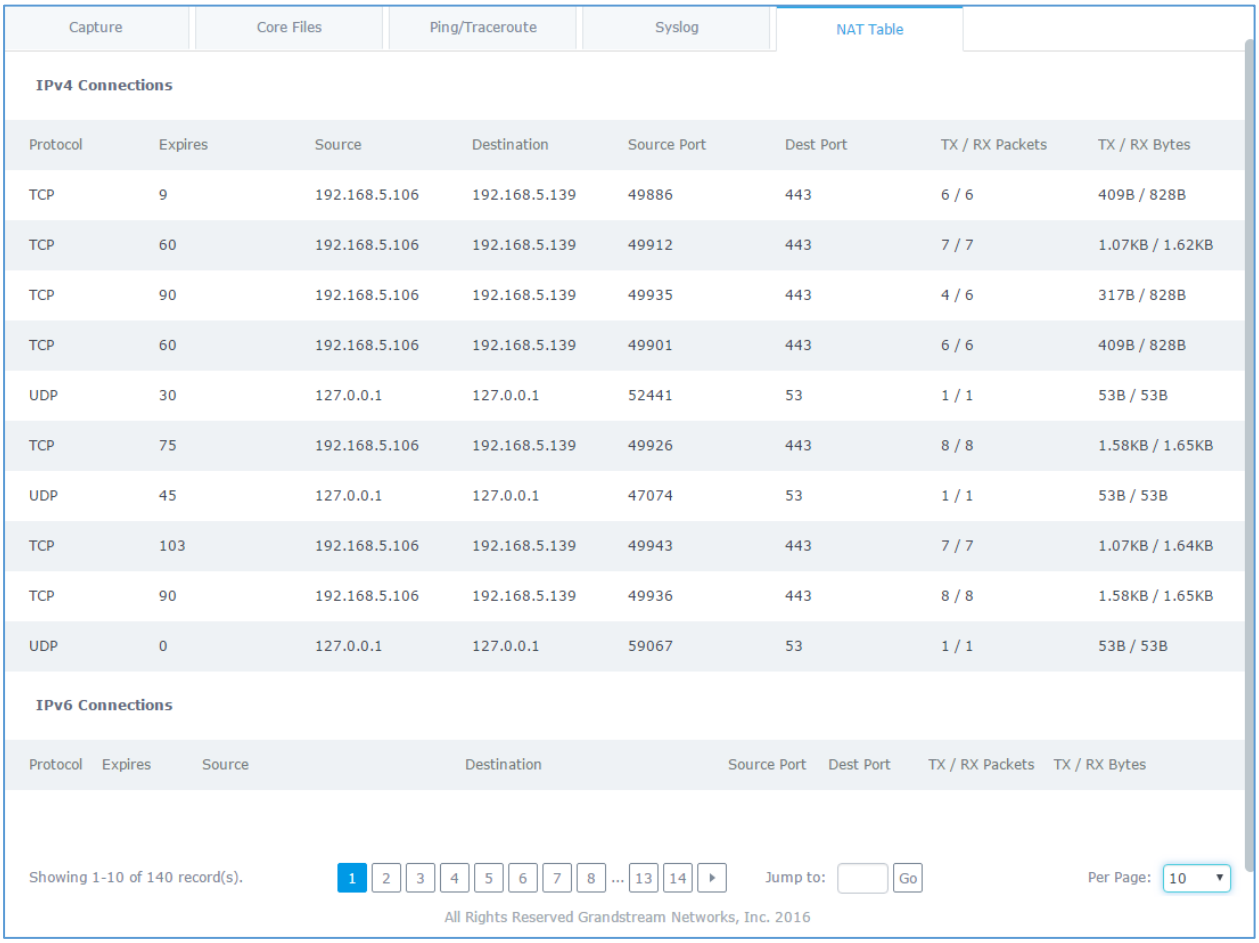


Figure 50: NAT table

File Sharing

The GWN7000 has 2 USB ports that can be also used for file sharing, to enable file sharing on devices plugged on the USB ports, go to **System Settings -> File Sharing.**

Click on Add to share a directory and its contents on a device connected to one of the USB ports of the GWN7000, the following figure will pop up.

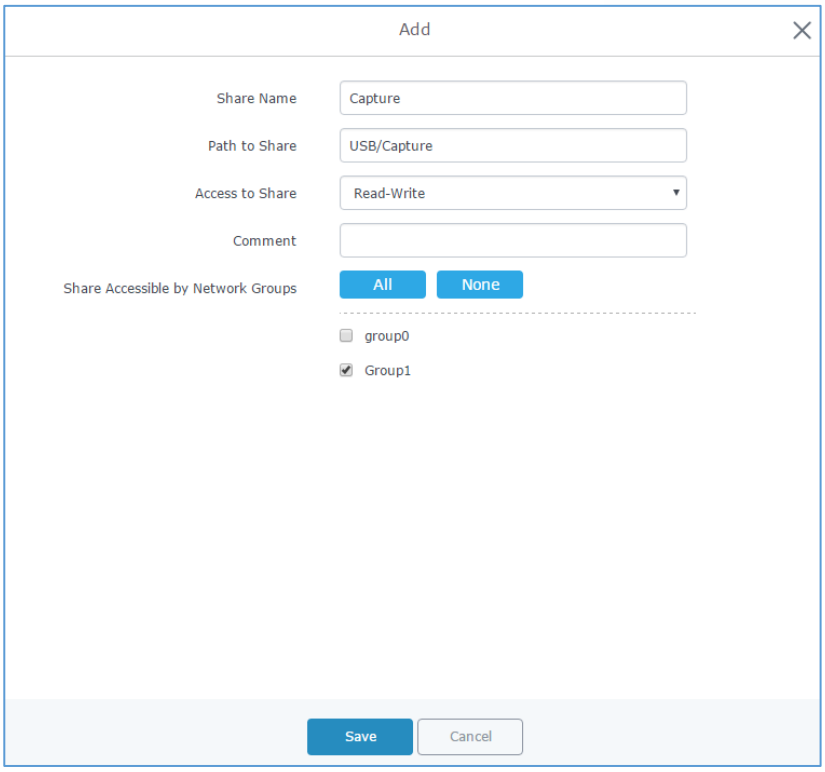


Figure 51: Add a New File to Share

Table 35: Add a New File to Share

Share Name	Enter the share name
Path to Share	Choose from the drop menu the path to share.
Access to Share	Choose whether to allow users to **Read/Write** or **Read Only** on the shared path.
Comment	Enter a comment for the added shared file.
Share Accessible by Network Groups	Choose whether to allow **All** LAN network groups to access the shared path, restrict access by selecting only some groups or **None**.

Edit a Shared Folder by clicking on or delete it by clicking on

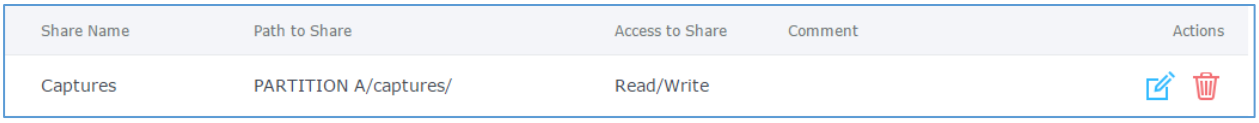


Figure 52: File Share Actions

A device connected to one of the allowed network groups to the shared files can use the following path for access: **\\GWN_Address\Share_Name** Where **GWN_Address** is the GWN7000 IP address, and **Share_Name** is the Share Name created for the File Share. It is also possible to map a network drive on Windows, or use a Samba client on Linux machine.

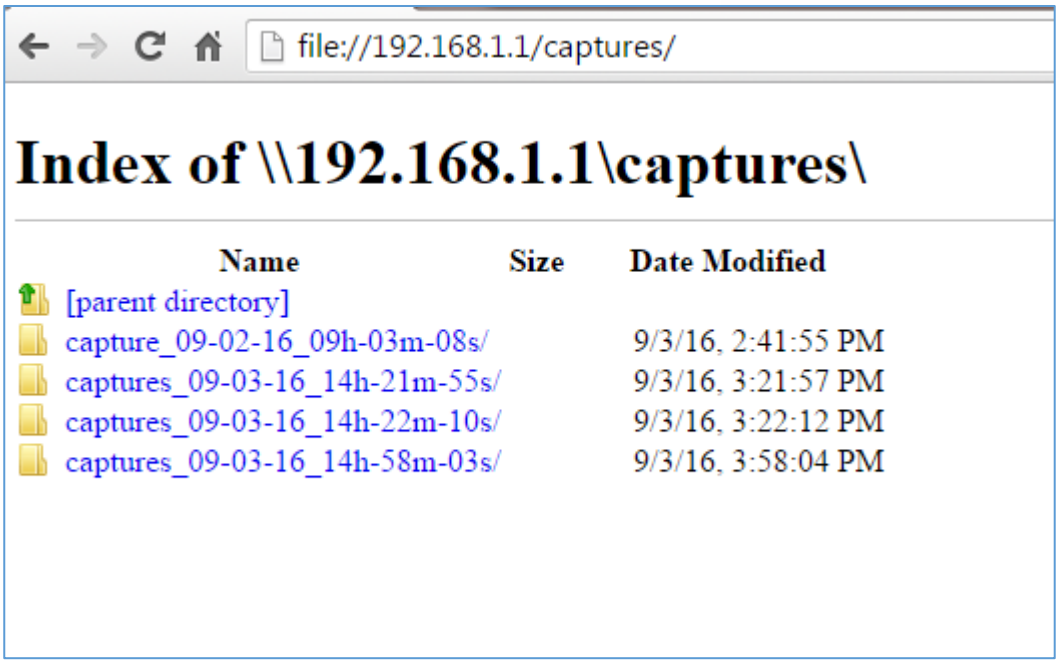


Figure 53: Access File Share

SNMP (Pending)

GWN7000 supports SNMP (Simple Network Management Protocol) which is widely used in network management for network monitoring for collecting information about monitored devices.

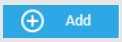
To configure SNMP settings, go to GWN7000 Web GUI -> **System Settings-> SNMP**, this page has two tabs: Basic and Advanced, refer to the below tables for each tab.

Table 36: SNMP Basic Page

System Location	Set the System Location information, for example: *SNMP-Server Lobby GWN.*
System Contact	Set the System Contact information, for example: Contact *Supervisor_GWN via extension is 1000.*
System Name	Set the System Name information, for example: *Supervisor_GWN.*
Read-Only Community for IPv4	Gives the permission for the set community to access and read only to devices in management information base via IPv4 Protocol.
Read-Write Community for IPv4	Gives the permission for the set community to access and read/write to devices in management information base via IPv4 Protocol.
Read-Only Community for IPv6	Gives the permission for the set community to access and read only to devices in management information base via IPv6 Protocol.

Read-Write Community for IPv6	Gives the permission for the set community to access and read/write to devices in management information base via IPv6 Protocol.
Trap Type	Choose the Trap Type from drop-down menu, 4 options are available: None, SNMPv1, SNMPv2c and SNMPv2cInforms.
Monitoring Host	Enter the Monitoring Host's IP/Domain Name (Network Management System "NMS")
Monitoring Host Port	Enter the Monitoring Host's Port (Network Management System "NMS")
Trap Community	Enter the Trap Community string to authenticate the client against the server.

Table 37: SNMP Advanced Page

SNMP Service Listening on	Click on  to add an SNMP Service Listening on: • Set the **Transport** Type: UDPv4, UDPv6, TCPv4 or TCPv6. • Choose the **IP Address** from drop-down menu list. • Set the **Port** number on which the GWN7000 will listen on.
SNMPv3 Users	Click on  to add an SNMPv3 User: • Set the **Username** for authentication. • Choose the **Authentication** type, 2 options are available: SHA and MD5. • Set the Authentication Password from **Authentication Passphrase.** • Enter the Password again to confirm from **Authentication Passphrase Confirmation.** • Choose the **Privacy Protocol**, 3 options are available: None, DES and AES. • Set the **Privacy Passphrase.** • Enter the **Privacy Passphrase** in **Privacy Passphrase Confirmation** field.

UPGRADING AND PROVISIONING

Upgrading Firmware

The GWN7000 can be upgraded to a new firmware version remotely or locally. This section describes how to upgrade your GWN7000.

Upgrading via WEB GUI

The GWN7000 can be upgraded via TFTP/HTTP/HTTPS by configuring the URL/IP Address for the TFTP/HTTP/HTTPS server and selecting a download method. Configure a valid URL for TFTP, HTTP or HTTPS; the server name can be FQDN or IP address.

Examples of valid URLs:
firmware.grandstream.com/BETA
192.168.5.87

The upgrading configuration can be accessed via **Web GUI**->**Router**->**Maintenance->Upgrade**.

Table 38: Network Upgrade Configuration

Upgrade Via	Vhoose the firmware upgrade method: TFTP, HTTP or HTTPS.
Firmware Server	Define the server path for the firmware server.
Check Update on Boot	Allows the device to check if there is a firmware from the configured firmware server at boot.
Automatic Upgrade check interval(m)	Set the value for automatic upgrade check in minutes.
Upgrade Now	Click on Upgrade button to begin the upgrade. Note that the device will reboot after downloading the firmware.

Note:

Please do not interrupt or power cycle the GWN7000 during upgrading process.

Service providers should maintain their own firmware upgrade servers. For users who do not have TFTP/HTTP/HTTPS server, some free windows version TFTP servers are available for download from
http://www.solarwinds.com/products/freetools/free_tftp_server.aspx
http://tftpd32.jounin.net

Please check our website at http://www.grandstream.com/support/firmware for latest firmware.

Instructions for local firmware upgrade via TFTP:

1. Unzip the firmware files and put all of them in the root directory of the TFTP server;
2. Connect the PC running the TFTP server and the GWN7000 to the same LAN segment;
3. Launch the TFTP server and go to the File menu->Configure->Security to change the TFTP server's default setting from "Receive Only" to "Transmit Only" for the firmware upgrade;
4. Start the TFTP server and configure the TFTP server in the GWN7000 web configuration interface;
5. Configure the Firmware Server to the IP address of the PC;
6. Update the changes and reboot the GWN7000.

End users can also choose to download a free HTTP server from http://httpd.apache.org/ or use Microsoft IIS web server.

Provisioning and backup

The GWN7000 configuration can be backed up locally or via network. The backup file will be used to restore the configuration on GWN7000 when necessary.

Download Configuration

Download the GWN7000 configurations for restore purpose under **Web GUI**->**Router**-> **Maintenance->Upgrade**

Click on 

to download locally the configuration file.

Configuration Server

Configuration Server Page allows to provision the GWN7000 by putting the config file on a TFTP/HTTP or HTTPS server, and set Config Server to the TFTP/HTTP or HTTPS server used in order for the GWN7000 to be provisioned with that config server file.

Reset and reboot

Used to reboot and reset the device to factory functions under **Web GUI**->

Router->**Maintenance->Upgrade** by clicking on Reboot button.

Reset Will restore all the online GWN76xx as well as well as the GWN7000 itself to factory settings.

EXPERIENCING THE GWN7000 ENTERPRISE ROUTER

Please visit our website: http://www.grandstream.com to receive the most up- to-date updates on firmware releases, additional features, FAQs, documentation and news on new products.

We encourage you to browse our product related documentation, FAQs and User and Developer Forum for answers to your general questions. If you have purchased our products through a Grandstream Certified Partner or Reseller, please contact them directly for immediate support.

Our technical support staff is trained and ready to answer all of your questions. Contact a technical support member or submit a trouble ticket online to receive in-depth support.

Thank you again for purchasing Grandstream GWN7000 Enterprise Multi-WAN Gigabit VPN Router, it will be sure to bring convenience and color to both your business and personal life