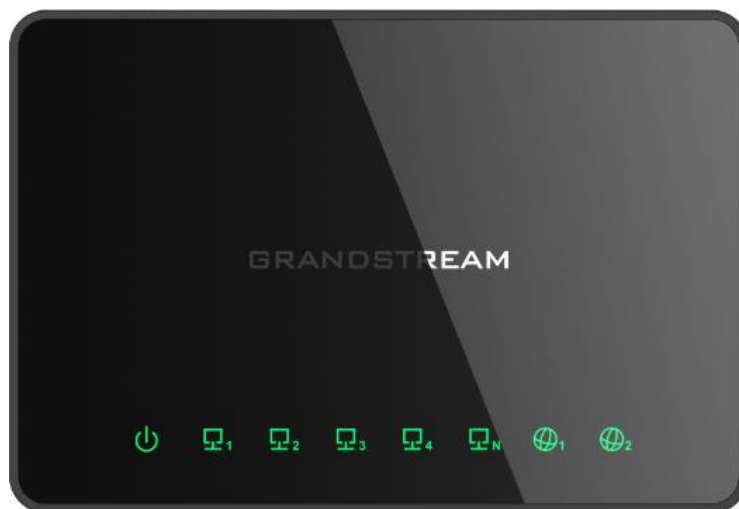


Grandstream Networks, Inc.

GWN7000

Enterprise Multi-WAN Gigabit VPN Router

User Manual



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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.



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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:

- [Product Overview](#)
- [Installation](#)
- [Getting Started](#)
- [Router Configuration](#)
- [Setting up a Wireless Network](#)
- [Clients Configuration](#)
- [VPN](#)
- [Firewall](#)
- [Captive Portal](#)
- [Bandwidth Rules](#)
- [Maintenance and Troubleshooting](#)
- [Upgrading and Provisioning](#)
- [Experiencing the GWN7000 Enterprise Router](#)



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 1.0.4.23

- Added support for enable/disable MPPE in both PPTP server and client. [MPPE]

Firmware Version 1.0.4.20

- Added support for Additional Routed Subnets. [Additional IPv4 Addresses][Additional IPv4 Static Address][Destination IP]
- Added support for Timed Client Disconnect and Enhanced Client Blocking. [Clients Access]
- Added support for Client Bridge (GWN76xx Access Point is required for this feature.). [Client Bridge]
- Added support for OpenApp ID for Deep Packet Inspection. [DPI]
- Added support for Syslog Server. [Logserver]
- Added support for PPTP Server. [PPTP CONFIGURATION]
- Added support for Smart Queue QoS. [Smart Queue]
- Added support for Configurable web UI access port.[Web WAN Access][Web HTTP Access][Web HTTPS Port]
- Added support for E-mail notifications. [Email/Notification]

Firmware Version 1.0.2.75

- Added support for Captive Portal [CAPTIVE PORTAL]
- Added support for Bandwidth Rules [BANDWIDTH RULES]
- Added support for Select Band per SSID [SSID Band]
- Added support for selectively enable 802.11b/g/n [Mode]
- Added option to enable/disable support for 802.11b devices [Allow Legacy Device(802.11b)]
- Added support for custom wireless power [Custom Wireless Power(dBm)]
- Added support for AP location using blinking LED [Access Point location]
- Added support for limit client count per SSID [Wireless Client Limit]
- Added support for better roaming decision [Enable Voice Enterprise]
- Added support for LEDs schedule [LED Schedule]
- Added support for Wi-Fi schedule [Wi-Fi Schedule]
- Added option to enable/disable DHCP option 66 & 43 override [Allow DHCP options 66 and 43 override]



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	<ul style="list-style-type: none"> • 2 x autosensing 10/100/1000 WAN Ports • 1 x autosensing 10/100/1000 configurable as LAN, WAN or VoIP port • 4 x autosensing 10/100/1000 LAN Ports
WAN	<ul style="list-style-type: none"> • DHCP • Static IP • PPPoE • Load balance & failover • Rule based routing
LAN	<ul style="list-style-type: none"> • DHCP server • DNS Cache • Multiple zones • VLAN
Auxiliary Ports	<ul style="list-style-type: none"> • 2 x USB 3.0 ports • 1 x Reset Pinhole
Routing Performance	Up to 1 million packets/second with 64-byte packet size
USB	<ul style="list-style-type: none"> • Printer sharing • File sharing
Network Protocols	<ul style="list-style-type: none"> • IPv4, IPv6, 802.1Q, 802.1p
VPN	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 802.3at PoE • Included Power Supply: 12V/2A • Max power consumption: 16W



Environmental	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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

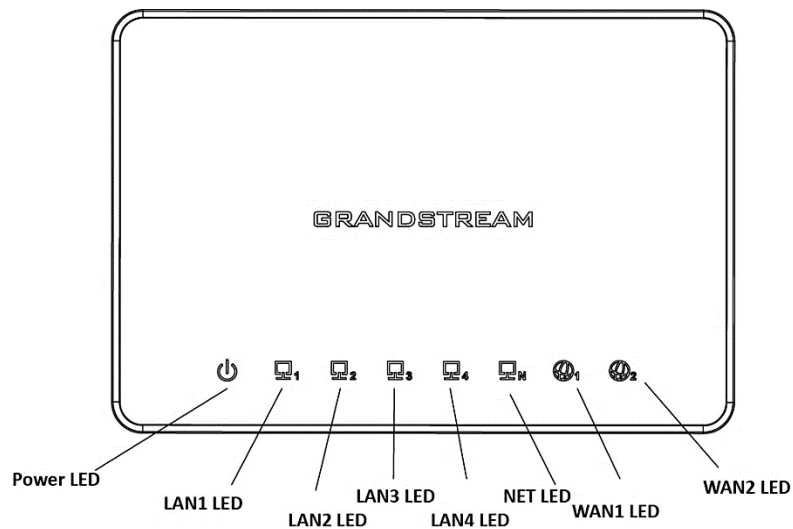


Figure 1: GWN7000 Front View



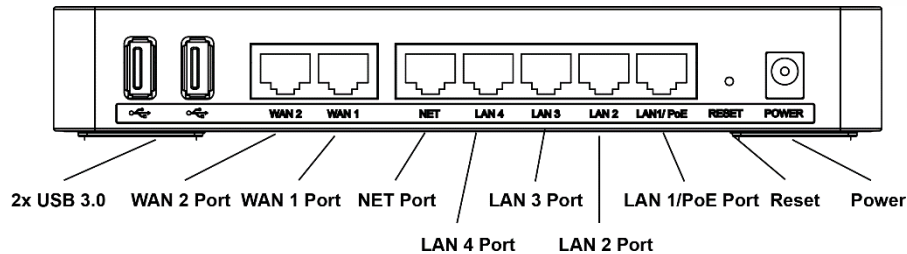


Figure 2: GWN7000 Back View

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.



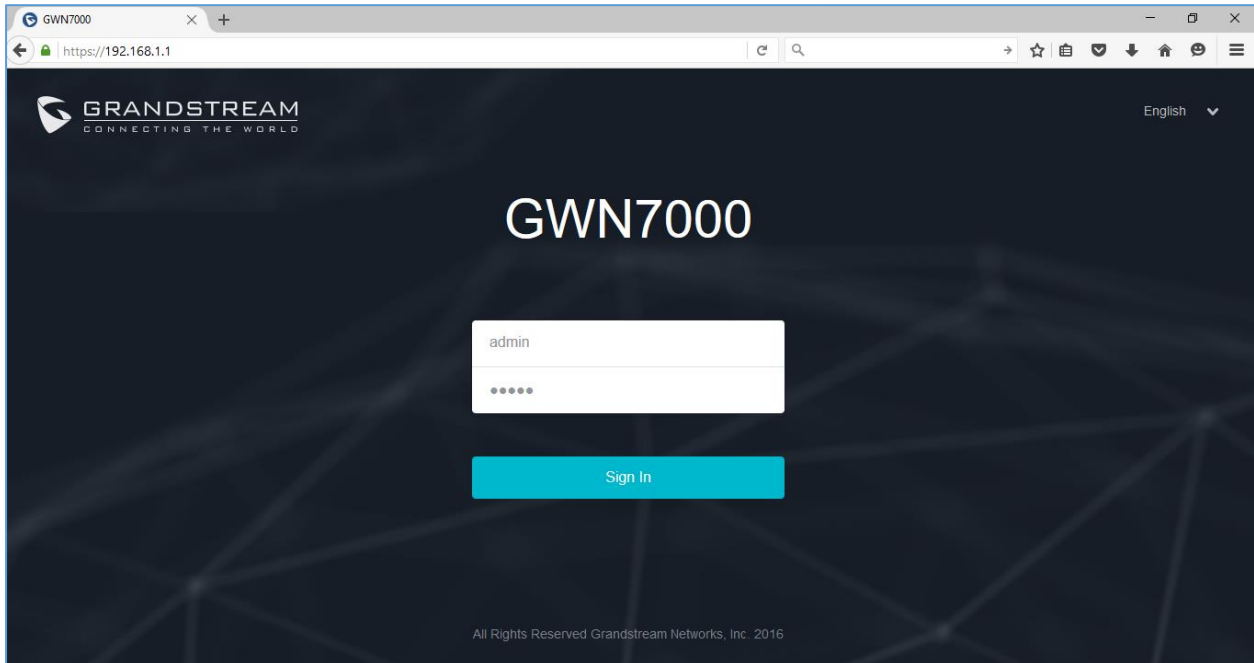


Figure 3: GWN7000 Web GUI Login Page

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.



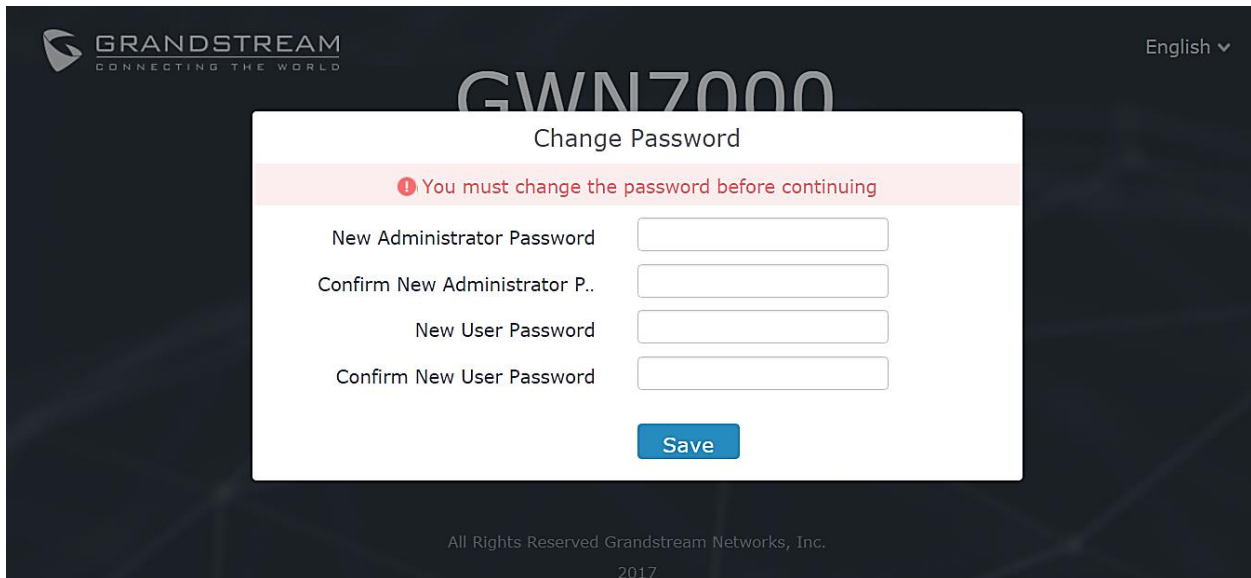



Figure 4: Change Password on first boot

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.

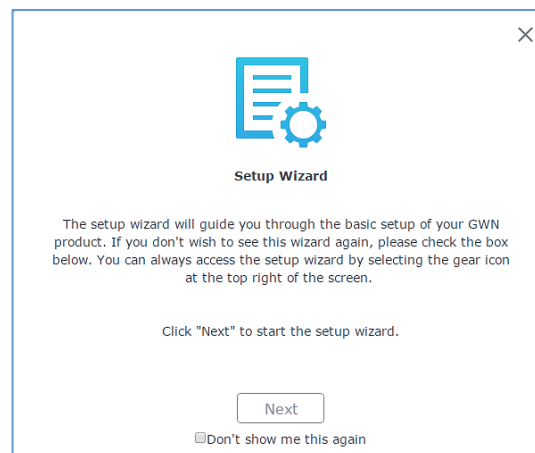


Figure 5: Setup Wizard

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.



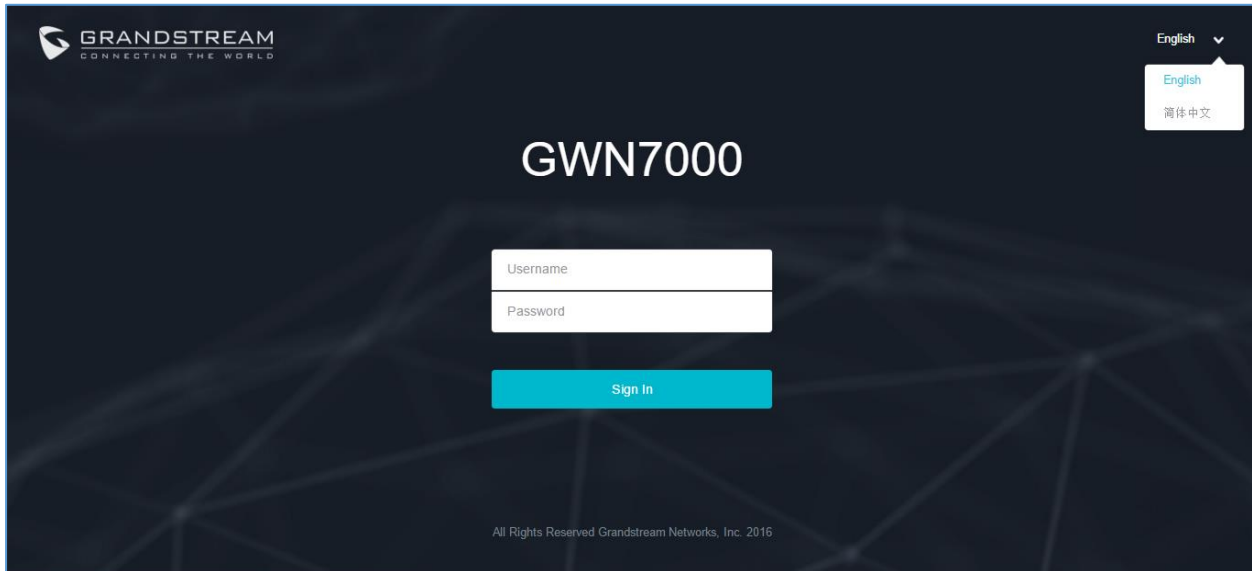


Figure 6: GWN7000 Web GUI Language



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.
- **Captive Portal:** Configuration settings for the captive portal feature.
- **Bandwidth Rules:** Configures the bandwidths rules that allows users to limit bandwidth utilization per SSID or client (MAC address or IP address).



- **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.

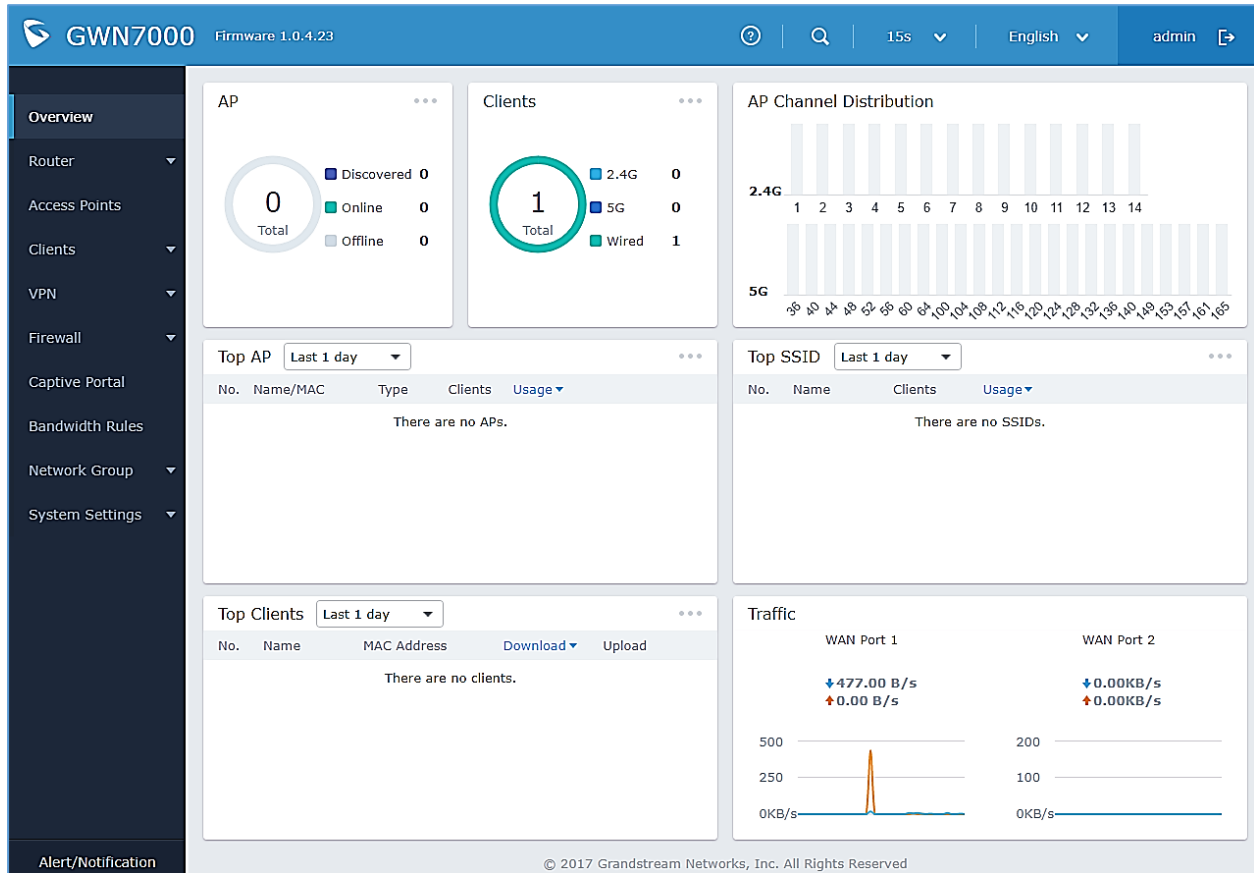







Figure 8: Overview Page


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.

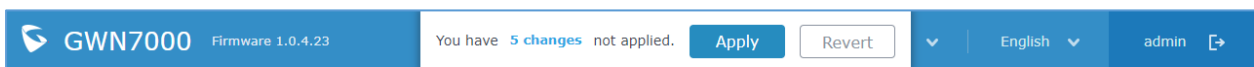


Figure 9: Apply Changes

Click on  button to apply changes, or  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 and also the application traffic.

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

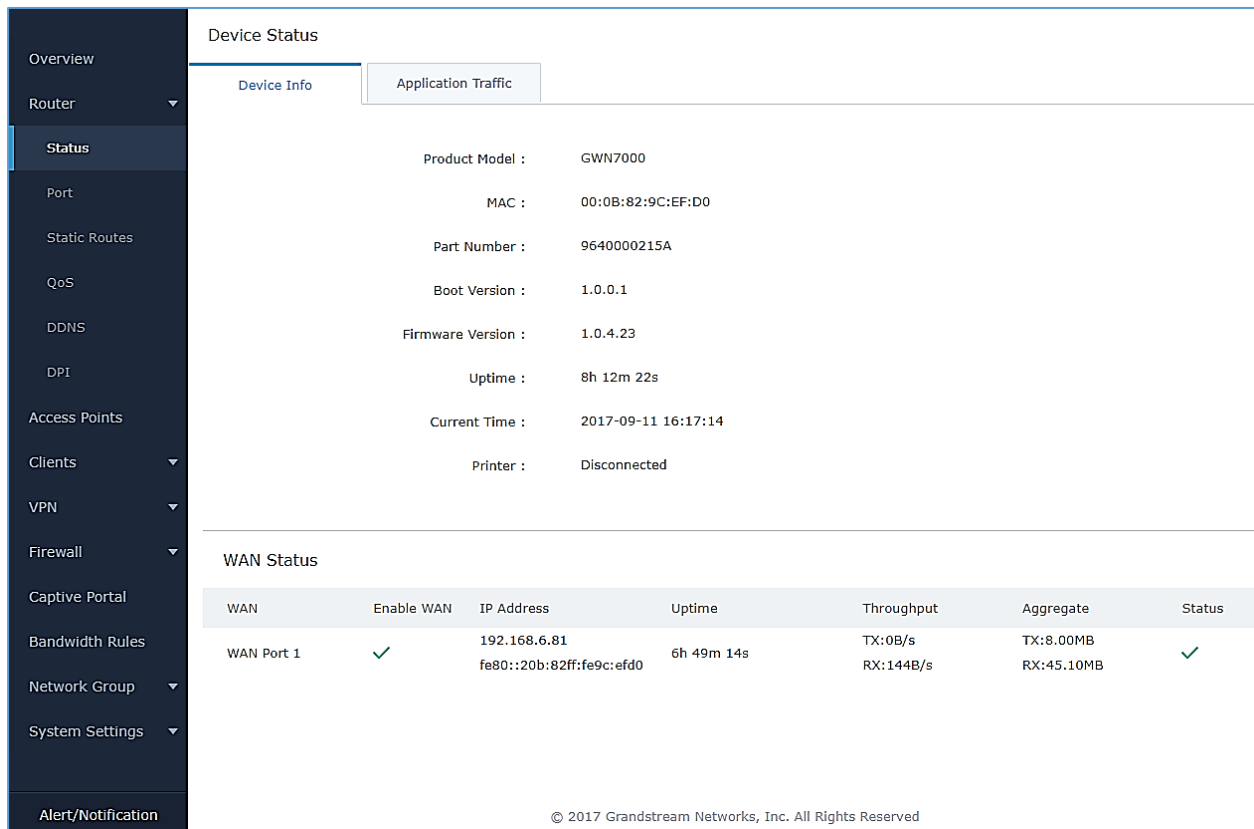


Figure 10: Router's Status

Note: Once DPI is enabled under Router feature. Users will be able to see their application traffics under **Application Traffic** section

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.
Name	Specify the port name.
WAN Address Type	<p>Select "DHCP", "Static" or "PPPoE" mode on the WAN interfaces of GWN7000. The default setting is "DHCP".</p> <ul style="list-style-type: none"> 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, IPv4 Subnet Mask, IPv4 Gateway and adding Additional IPv4 Addresses as well to communicate with the web interface, SSH, or other services running on the device. 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	<p>This option is appearing when enabling "Native IPv6" option.</p> <p>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:</p> <ul style="list-style-type: none"> IPv6 Address/Prefix Length Used to set an IPv6 address/Prefix length when using Static IPv6 option Example: <i>fec0:470:28:5b2::1/64</i> IPv6 Gateway Used to define the Gateway's IPv6 address. IPv6 Prefix/IPv6 Prefix Length Enter the IPv6 prefix and IPv6 prefix length. Example: <i>::1/64</i>



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: <ul style="list-style-type: none"> • 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 and 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	Specifies the operating mode for multi -WAN. Three options are available: <ul style="list-style-type: none"> • Disabled • Failover: Automatically switch to the connected WAN after failure. • Load Balance + Failover: Operating the load balance mode, at the same time automatically switch to the connected WAN after failure.
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  .

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.
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
NextHop	Enter the NextHop 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
NextHop	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.

QoS

Global
Upstream QoS
Policer
Smart Queue

Interface ▲	Enabled	Upstream	Downstream	Actions
WAN Port 1	✓	20Mbit	300Mbit	✎
WAN Port 2	✓	100Mbit	1000Mbit	✎

Enable QoS ?

The device will be rebooted when the master QoS enable/disable setting is changed

Save
Reset

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.
- **Smart Queue:** The smart queue is an integrated network system that performs better per-packet/per flow network scheduling, reduces the buffer bloat and keeps latency at acceptable levels.

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: <i>500Mbit</i> <i>100Kbit</i> <i>500</i>
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: <i>1000Mbit</i> <i>100Kbit</i> <i>500</i>

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: <i>100Mbit</i> <i>100Kbit</i> <i>500</i>

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 Destination 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.

Table 16: QoS Smart Queue

Enabled	Check this option in order to enable the feature on the WAN interface.
Qdisc	Select which Queuing discipline method to use for QoS: <ul style="list-style-type: none"> • fq_codel (Fair Queue with Controlled Delay) • Cake
Manager	Choose the type of the smart queue management: If fq_codel queuing discipline method is selected. <ul style="list-style-type: none"> • simple: Three-tier prioritization system. • simplest: HTB (Hierarchical Token Bucket) shaper with a single fq_codel queuing discipline. • simplest_tbf: TBF (Token Bucket Filter) shaper with a single fq_codel queuing discipline. If cake queuing discipline method is selected. <ul style="list-style-type: none"> • layer_cake: Three-tier prioritization system with cake as a replacement for HTB rate limiting. • piece_of_cake: Single queue with cake as a replacement for HTB rate limiting.
Link -layer Adaptation	Select the link-layer type for the WAN connection. This can be used to compensate for the link-layer overhead of certain types of WAN connections. <ul style="list-style-type: none"> • None (default). • Ethernet (should be selected for VDSL connections). • ATM (should be selected for ADSL connections).
Overhead	If the link-layer is set to something other than “none”, then the link-layer overhead setting can be used to specify how many bytes of overhead there are. Defaults are 8 for Ethernet, and 44 for ATM.
Advanced Qdisc Options	Check this option in order to show advanced Qdisc options to be used.
Squash DSCP on ingress	Select whether to squash or not the DSCP on ingress packets. By default, this option is disabled.



Ignore DSCP on ingress	Select whether to ignore DSCP on ingress packets or not. By default, this option is disabled.
ECN Status on Inbound packets	Select whether to set or not ECN status on inbound packets.

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.

DPI

DPI stands for Deep Packet Inspection which is an option that allows the GWN7000 to analyze the core of the packet to collect and report information at the Application-layer, such as traffic volume of an application used by the host.

Snort OpenApp ID allows the System Administrator to view the internet traffic of users. The GUI displays traffic data in a human-readable format, such as 'Streaming MP4 & Netflix - 31% of total traffic usage.' The data is accompanied by a graph.



GWN7000 is using Snort for packet inspection and displays traffic status under **Status→Application Traffic** as shown on the figure below.

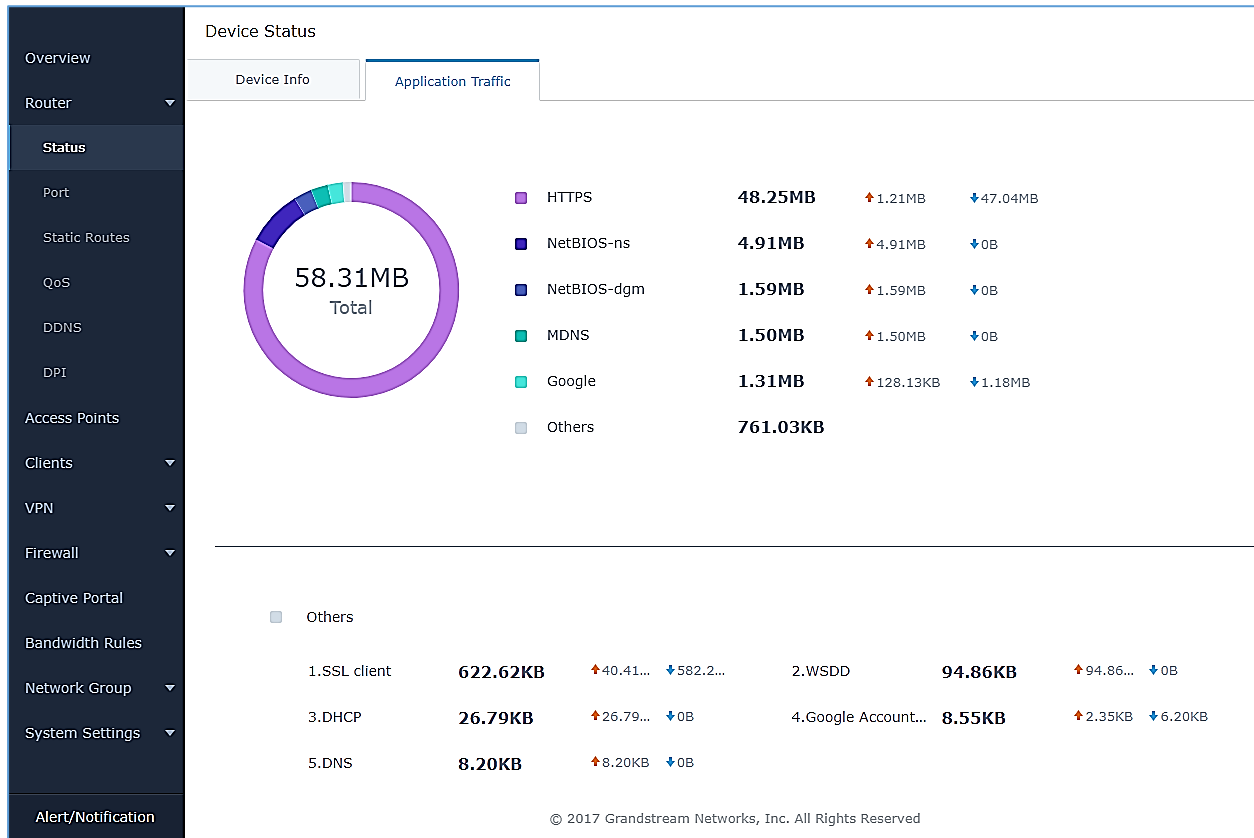


Figure 12: DPI Status

The following table contains the description of the DPI configuration settings.

Table 17: DPI Settings

Enable Application Tracking	Enables the application tracking. By default, it's disabled.
Interface	Select the interface on which the application tracking will be performed. By default, it's WAN Port 1.

Note: A reboot is required after enabling Depp packet inspection in order for the feature to take effect.



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**.

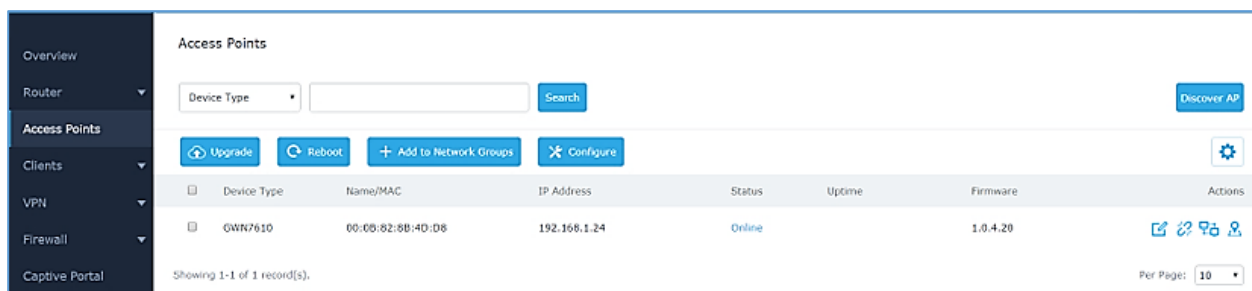




Figure 13: Discover AP



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








Discovered Devices				
Device Type	MAC	IP Address	Firmware	Actions
GWN7600	00:0B:82:8B:58:30	192.168.1.176	1.0.3.19	
GWN7610	00:0B:82:8B:4D:D8	192.168.1.24	1.0.4.20	

Showing 1-2 of 2 record(s). Per Page: 10



Figure 14: Discovered Devices

- Click on Pair  under Actions, to pair the discovered Access Point with the GWN7000.
- The paired GWN76xx will appear Online, Click on  to unpair it.

Upgrade Reboot Add to Network Groups Configure 							
<input type="checkbox"/>	Device Type	Name/MAC	IP Address	Status	Uptime	Firmware	Actions
<input type="checkbox"/>	GWN7610	00:0B:82:8B:4D:D8	192.168.1.24	Online	35m 52s	1.0.4.20	   

Showing 1-1 of 1 record(s). Per Page: 10

Figure 15: GWN7610 online

- 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.
- Click on  to configure client bridge on the selected access point. For more details about the client bridge feature, please refer to **Client Bridge**.

Refer to below table for Device Configuration tabs.

Table 18: 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.
Clients	Shows the Clients connected to the GWN76xx access point.
Configuration	<ul style="list-style-type: none"> 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”.
- **Allow Legacy Device(802.11b):** This feature appears when “Mode” option is set to “802.11g” or “802.11n”, it allows legacy devices not supporting “802.11g/n” mode to connect using the “802.11b” mode.
- **Custom Wireless Power(dBm):** allows users to set a custom wireless power for both 5GHz/2.4GHz band, the value of this field must be between 1 and 31.

Access Point location

GWN7000 router has an interesting feature to help users to locate different access points using blinking LED, to do so go under the access points page then click on button as shown on the below figure and the corresponding LED will start blinking its LEDs. This can help ease locating the Access points on a multi-deployment site.

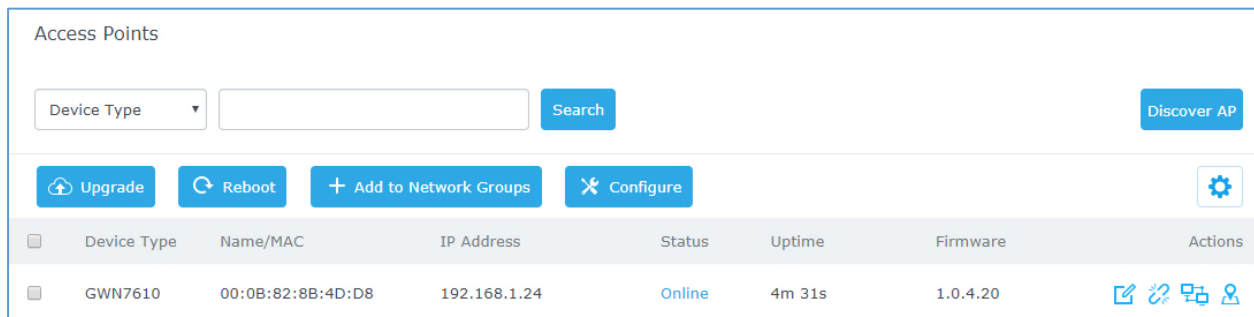


Figure 16: locating Access Points

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 supports 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**.








Name	Enabled	SSID	Enable Wi-Fi	WAN Membership	LAN Membership	VLAN ID	IP Address	Actions
Group_GS	✓	Wifi_GS	✓	WAN Port 1	lan0	2	192.168.2.1	 
group0	✓	GWN	✓	WAN Port 1			192.168.1.1	 

Figure 17: Network Group

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

Edit ✕

Basic
Wi-Fi
Device Membership
Schedule

Network Group Name ?

Enabled

WAN Membership ?

LAN Membership ?

VLAN

VLAN ID

Enable IPv4 ?

IPv4 Static Address

Additional IPv4 Static Addresses -

Add new item +

IPv4 Subnet Mask

DHCP Enabled for IPv4

DHCPv4 Relay Enabled

Enable IPv6 ?

Save
Cancel





Figure 18: 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 19: Basic

Network Group Name	Specifies the name for the network group.
Enabled	Check to activate the newly created 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.
Additional IPv4 Static Address	Set an additional 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".
DHCP 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
DHCP Gateway	Defines the IP address of the DHCP gateway.
DHCP Preferred DNS	Set the preferred DNS Servers via DHCP.
DHCP Alternate DNS	Set the alternate DNS Servers via DHCP.
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 IPv6	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 whether to enable IPv6 DHCP server for 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 20: Wi-Fi

Enable Wi-Fi	Check to enable Wi-Fi for the network group.
SSID	Set or modify the SSID name.
SSID Band	Select the Wi-Fi band the GWN will use, three options are available: <ul style="list-style-type: none"> • Dual-Band • 2.4GHz • 5Ghz
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.
Wireless Client Limit	Configure the limit for wireless client. If there's an SSID per-radio on a network group, each SSID will have the same limit. Setting a limit of 50 will limit each SSID to 50 users independently. If set to 0 the limit is disabled.
Enable Captive Portal	Click on the checkbox to enable the captive portal feature.
Captive Portal Policy	Select the captive portal policy already created on the "Captive portal" web page to be used in the created SSID.
Security Mode	Set the security mode for encryption. 5 options are available: <ul style="list-style-type: none"> • 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.



	<ul style="list-style-type: none"> • 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.
Client Bridge Support	<p>Configures the client bridge support to allows the access point to be configured as a client for bridging wired only clients wirelessly to the network. When an access point is configured in this way, it will share the WiFi connection to the LAN ports transparently. Once a Network Group has an Client Bridge Support enabled, the AP adopted in this Network Group can be turned in to Bridge Client mode by click the Bridge button.</p>
Client Time Policy	<p>Configures the client time policy. Default is None.</p>
Use MAC Filtering	<p>Choose Blacklist/Whitelist to specify MAC addresses to be excluded/included from connecting to the zone’s Wi-Fi. Default is Disabled.</p>
Client Isolation	<p>Client isolation feature blocks any connection between Wireless clients connected to GWN76xx’s Wi-Fi access point. Client isolation can be helpful to increase security for Guest networks/Public WiFi. Available modes are:</p> <ul style="list-style-type: none"> • Internet Mode: Wireless clients will be allowed to access only the internet services and they cannot access any of the management services, either on the router nor the GWN76xx access points. • Gateway MAC Mode: Wireless clients can only communicate with the gateway, the communication between Wireless clients is blocked and they cannot access any of the management services on the GWN76xx access points. • Radio Mode: Wireless clients can access to the internet services, GWN7000 router and the access points GWN76xx but they cannot communicate with other Wireless clients.



Gateway MAC Address	<p>This field is required when using Client Isolation, so users will not lose access to the Network (usually Internet).</p> <p>Type in the default LAN Gateway's MAC address (router's MAC address for instance) in hexadecimal separated by ":".</p> <p>Example: 00:0B:82:8B:4D:D8</p>
RSSI Enabled	<p>Check to enable RSSI function, this will lead the AP to disconnect users below the configured threshold in Minimum RSSI (dBm).</p>
Minimum RSSI (dBm)	<p>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".</p>
Enable Voice Enterprise	<p>Enable this feature to help clients of APs connected to the GWN7000 to perform better roaming decision.</p> <ul style="list-style-type: none"> The 802.11k standard helps clients to speed up the search for nearby APs that are available as roaming targets by creating an optimized list of channels. When the signal strength of the current AP weakens, your device will scan for target APs from this list. When your client device roams from one AP to another on the same network, 802.11r uses a feature called Fast Basic Service Set Transition (FT) to authenticate more quickly. FT works with both pre-shared key (PSK) and 802.1X authentication methods.
Enable 11R Enable 11K Enable 11V	<p>11R, 11V, 11K respectively represents the feature sets the three protocols 802.11r, 802.11v, 802.11k specifies, enterprise audio is a function based on these feature sets, and 11R is required, without this function, the enterprise audio will be unavailable.</p>
Upstream Rate	<p>Set a limitation of upload speed on the SSID.</p>
Downstream Rate	<p>Set a limitation of download speed on the SSID.</p>

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



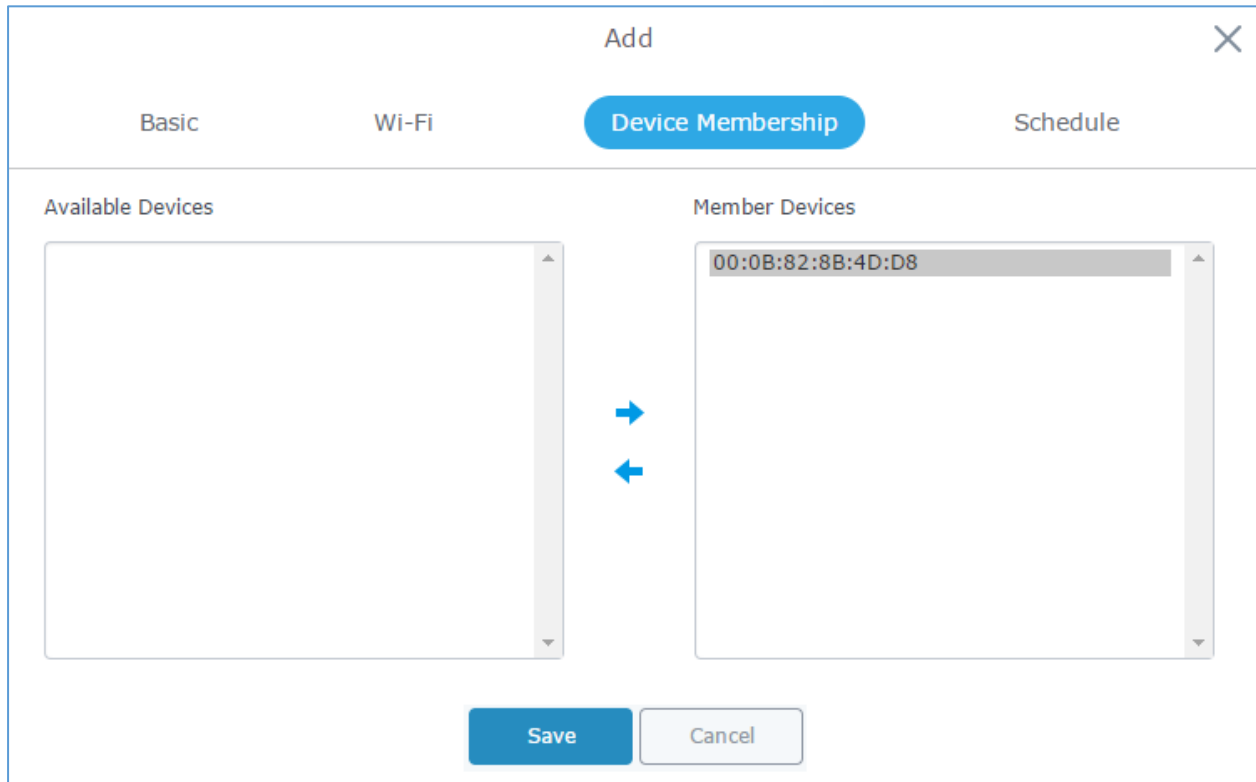


Figure 19: Device Membership

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

- **Wi-Fi Schedule:** Used to schedule the times when the Wi-Fi is ON or OFF.

In the below example, the Wi-Fi is scheduled to be active Monday starting from 8:00 AM until 5:00 PM.

Note: The hour field is in 24 format (from 0 to 23). Valid range for minutes is 0-59.



Add ✕

Basic
Wi-Fi
Device Membership
Schedule

Enable Wireless Schedule

Sunday

Monday

Schedule Start Time :

Schedule End Time :

Tuesday

Wednesday

Thursday

Friday

Saturday

Save
Cancel

Figure 20: Wi-Fi Schedule

Note:

The schedule feature is based on SSID and not network group, meaning that you can schedule the broadcasting of different SSID on different periods of the day.

Users can Also add a device to a Network Group from Access Points Page:

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



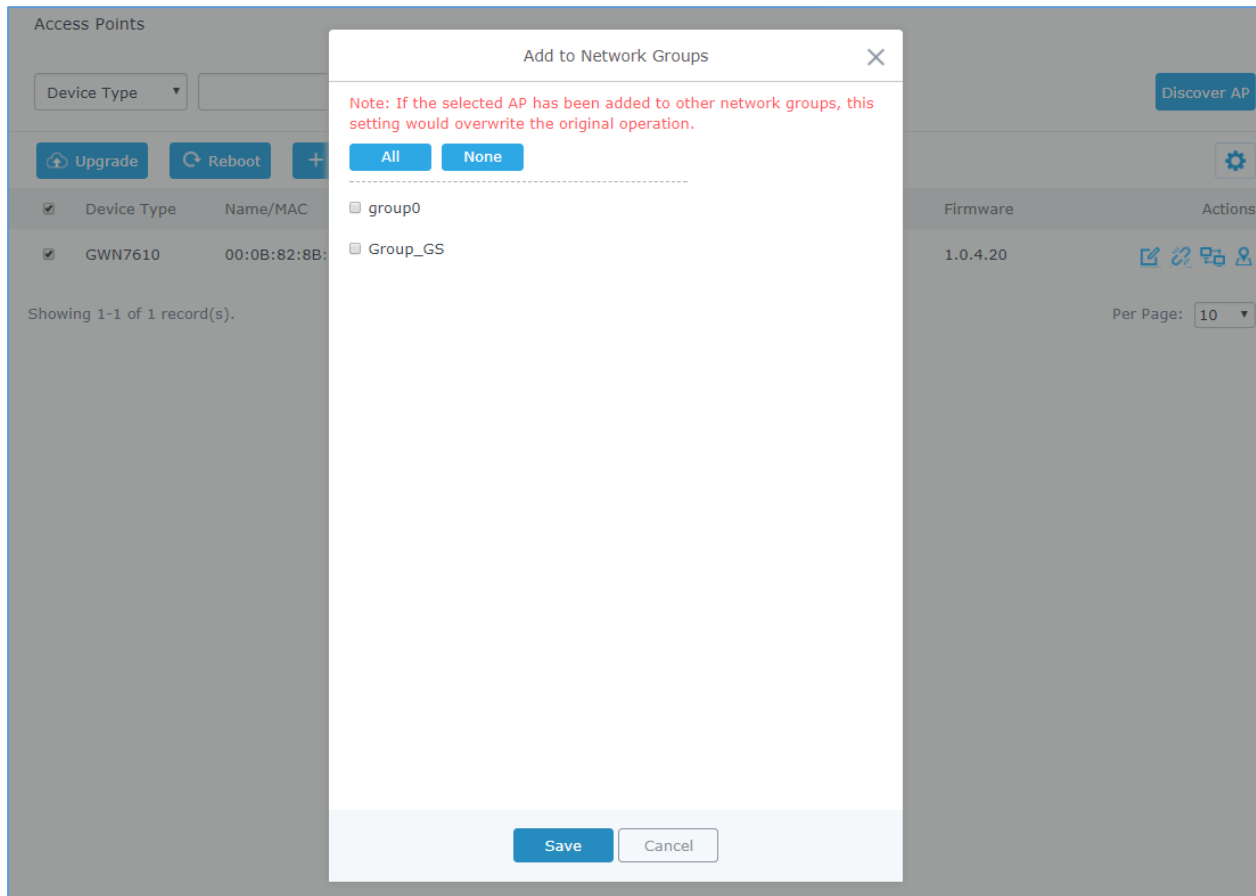


Figure 21: Add AP to Network Group from Access Points Page

- 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.



Add ✕

Basic
Wi-Fi
Device Membership
Schedule

Enable Wi-Fi

SSID ?

SSID Band

SSID Hidden

Wireless Client Limit ?

Enable Captive Portal

Security Mode

WPA Key Mode

WPA Encryption Type

WPA Pre-Shared Key ? 👁

Client Bridge Support

Client Time Policy

Use MAC Filtering

Client Isolation ?

Enable Minimum RSSI ?

Figure 22: Create an SSID

Refer to [Table 20: 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**.



Add ✕

Wi-Fi
Schedule

Enable Additional SSID

SSID ?

SSID Band

Network Group Membership

SSID Hidden

Wireless Client Limit ?

Enable Captive Portal

Security Mode

WPA Key Mode

WPA Encryption Type

WPA Pre-Shared Key ? 👁

Client Bridge Support

Client Time Policy

Use MAC Filtering

Client Isolation

Figure 23: 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 24: Additional SSID Created

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



Client Bridge

The Client Bridge feature allows an access point to be configured as a client for bridging wired only clients wirelessly to the network. When an access point is configured in this way, it will share the WiFi connection to the LAN ports transparently. This is not to be confused with a mesh setup. The client will not accept wireless clients in this mode.

Once a Network Group has an Client Bridge Support enabled, the AP adopted in this Network Group can be turned in to Bridge Client mode by click the Bridge button .

Please be noted that once an AP it turned into Client Bridge mode, it cannot be controlled by a Master anymore, and a factory reset is required to turn it back into normal AP mode.

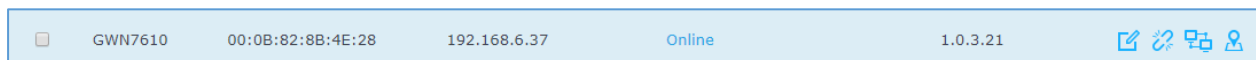


Figure 25: Client Bridge

Important Notes:

- The access point that will be operating on bridge mode, must be set with a fixed IP address before activating the bridge mode on the access point.
- Users must enable client bridge support option under network group or SSID WiFi settings in order to have it fully functional. See **[Client Bridge Support]**



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.

MAC	Hostname	Type	IP Address	Radio/Channel	Status	AP	Throughput	Aggregate	Actions
00:0B:82:76:F4:29		Wired	192.168.6.213		Offline	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
00:0B:82:75:21:20		Wired	192.168.6.141		Online	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
80:83:FE:6D:3C:C6		Wired	192.168.6.237		Online	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
00:0B:82:6B:10:52		Wired	192.168.6.145		Offline	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
00:0B:82:5E:66:D9		Wired	192.168.6.229		Offline	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
24:77:03:C8:72:90	DESKTOP-1A7...	Wireless	192.168.6.150	5GHz 36	Offline	00:0B:82:8B:4E:28	TX:515B/s RX:0b/s	TX:5.61MB RX:6.78MB	
24:77:03:F3:E4:14	DESKTOP-UDU...	Wireless	192.168.6.93	2.4GHz 1	Offline	00:0B:82:8B:4D:D4	TX:17.47KB/s RX:24.09KB/s	TX:34.95KB RX:48.18KB	
A4:1F:72:6B:FD:09	EMEA-PC.lan	Wired	192.168.6.74		Offline	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
88:51:FB:57:7D:B0	Surveillance-PC.	Wired	192.168.6.75		Online	Wired	TX:0b/s RX:0b/s	TX:0b RX:0b	
F0:9A:51:0B:82:33	android-c887b...	Wireless	192.168.6.29	2.4GHz 1	Offline	00:0B:82:8B:4D:D4	TX:0b/s RX:0b/s	TX:652.51KB RX:113.40KB	

Showing 61-70 of 123 record(s). ◀ 1 2 3 4 5 6 7 8 ... 12 13 ▶ Jump to: Go Per Page: 10 ▼

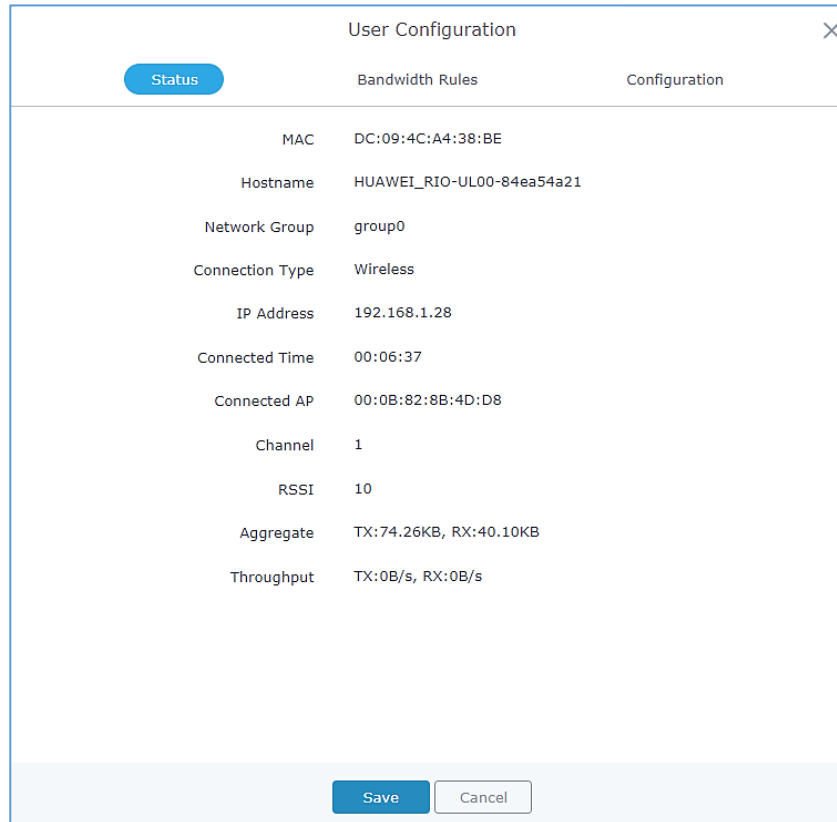
Figure 26: Clients

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.





The dialog box is titled "User Configuration" and has a close button (X) in the top right corner. It features three tabs: "Status" (selected), "Bandwidth Rules", and "Configuration". The "Status" tab displays the following information:

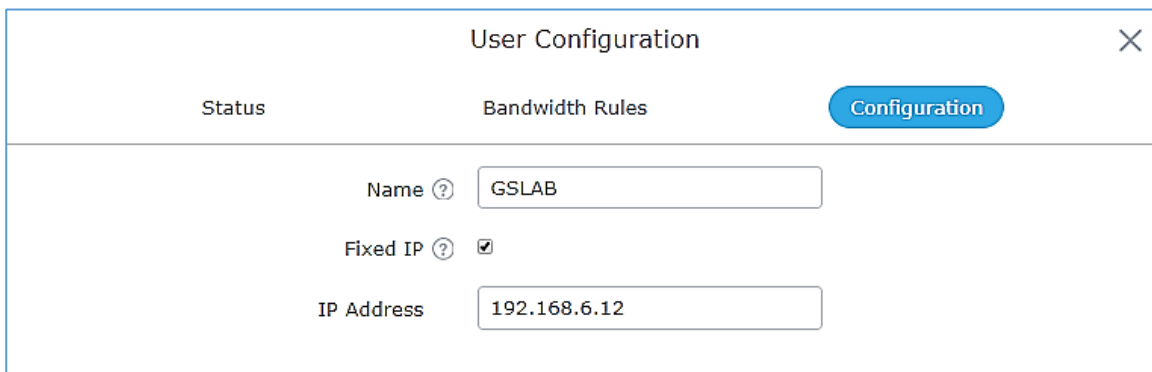
MAC	DC:09:4C:A4:38:BE
Hostname	HUAWEI_RIO-UL00-84ea54a21
Network Group	group0
Connection Type	Wireless
IP Address	192.168.1.28
Connected Time	00:06:37
Connected AP	00:0B:82:8B:4D:D8
Channel	1
RSSI	10
Aggregate	TX:74.26KB, RX:40.10KB
Throughput	TX:0B/s, RX:0B/s

At the bottom of the dialog, there are "Save" and "Cancel" buttons.

Figure 27: Client's Status

Edit IP and Name

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



The dialog box is titled "User Configuration" and has a close button (X) in the top right corner. It features three tabs: "Status", "Bandwidth Rules", and "Configuration" (selected). The "Configuration" tab displays the following configuration options:

- Name [?]:
- Fixed IP [?]:
- IP Address:

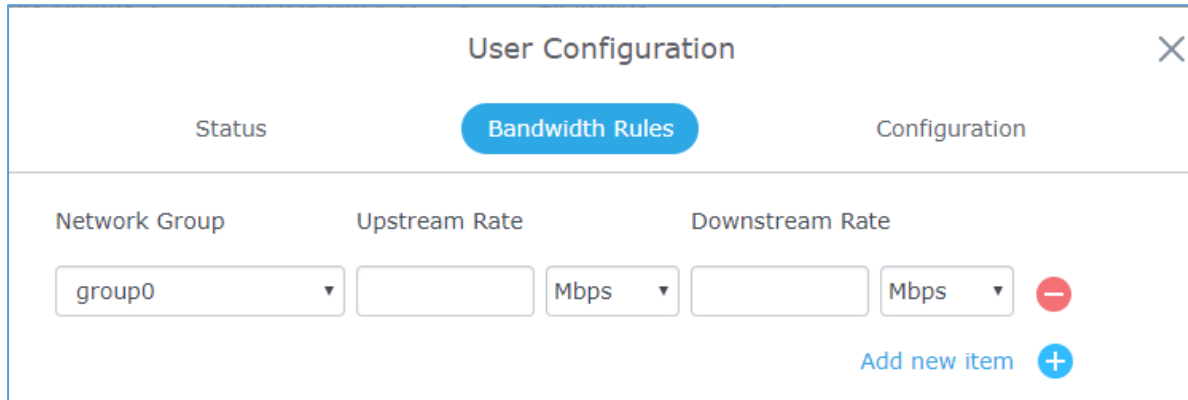
Figure 28: Client's Configuration

Bandwidth Rules

As mentioned on the **BANDWIDTH RULES** section, users can set bandwidth rules for upstream and downstream links per SSID, or per Client. For Clients users can set bandwidth rules by navigating to the menu **Client**→**Edit**→**Bandwidth Rules** then click add new item.




The following figure shows the settings:





The screenshot shows the 'User Configuration' window with the 'Bandwidth Rules' tab selected. It features three tabs: 'Status', 'Bandwidth Rules', and 'Configuration'. Below the tabs, there are three columns: 'Network Group', 'Upstream Rate', and 'Downstream Rate'. The 'Network Group' dropdown is set to 'group0'. The 'Upstream Rate' and 'Downstream Rate' fields are empty, with 'Mbps' selected for both. There are minus and plus icons for adjusting the rates, and an 'Add new item' button with a plus icon.

Figure 29: Client Bandwidth Rules

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**.

MAC	Hostname	Type	IP Address	Radio/Channel	Status	AP	Throughput	Aggregate	Actions
C8:38:70:3C:11:A6	android-ce522...	Wireless	192.168.1.32	2.4GHz 11	Online 00:06:38	00:0B:82:8B:4E:24	TX:844B/s RX:1.14KB/s	TX:93.06KB RX:73.33KB	 


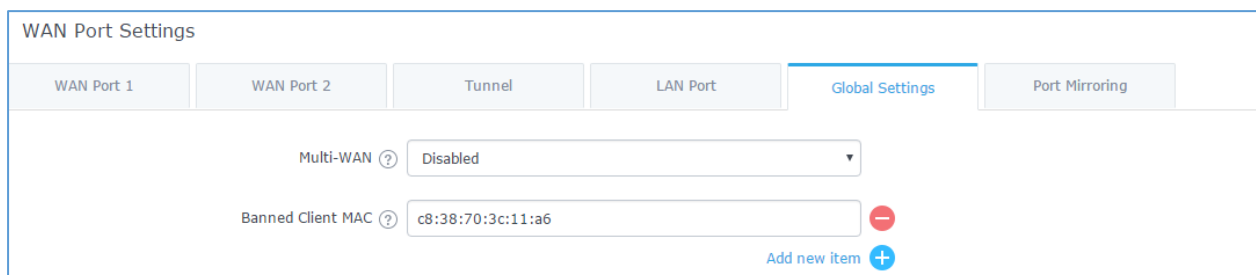
Showing 1-1 of 1 record(s) Per Page: 10 

Figure 30: Block a Client

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



The screenshot shows the 'WAN Port Settings' window with the 'Global Settings' tab selected. It includes tabs for 'WAN Port 1', 'WAN Port 2', 'Tunnel', 'LAN Port', 'Global Settings', and 'Port Mirroring'. The 'Multi-WAN' dropdown is set to 'Disabled'. The 'Banned Client MAC' field contains 'c8:38:70:3c:11:a6' and has a minus icon to the right. There is an 'Add new item' button with a plus icon.

Figure 31: Unban Client

Clients Access

From this menu, users can manage in global and way the blacklist of clients that will be blocked from accessing the WiFi network, click on **Client Access** to add or remove MAC addresses of client from global blacklist.





Name	MAC Addresses	Actions
Global Blacklist	(2) 48:4B:AA:08:3F:92, 48:4B:AA:08:3F:90	 

Figure 32: Global Blacklist

Edit

Name

MAC Addresses

-

-

Add new item +

Figure 33: Managing the Global Blacklist

A second option, is to add custom access lists that will be used as matching mechanism for MAC address filtering option under network groups and SSIDs to allow (whitelist) or disallow (blacklist) clients access to the WiFi network. Click on + Add in order to create new access list, then fill it with all MAC addresses to be matched. Once this is done, this access list can be used under network group or SSID WiFi settings to filter clients either using whitelist or blacklist mode.

EDIT

Basic
Wi-Fi
Device Membership
Schedule

SSID Hidden

Wireless Client Limit ?

Enable Captive Portal

Security Mode

Client Bridge Support

Client Time Policy

Use MAC Filtering

MAC Blacklist ACL1

Figure 34: Blacklist Access List

Time Policy

The timed client disconnect feature allows the system administrator to set a fixed time for which clients should be allowed to connect to the access point, after which the client will no longer be allowed to connect for a user configurable cool-down period. The configuration is based on a policy where the administrator can set the amount of time for which clients are allowed to connect to the WiFi and reconnect type and value after which they will be allowed to connect back after they have been disconnected.




In order to create a new policy, go under **Clients**→**Time Policy** and add new one., then the following parameters:

Table 21: Time Policy Parameters

Option	Description
Name	Enter the name of the policy
Enabled	Check the box to enable the policy
Limit Client Connection Time	Sets amount of time a client may be connected.
Client Reconnect Timeout Type	Select the method with which we will reset a client’s connection timer so they may reconnect again. Options are: <ul style="list-style-type: none"> • Reset Daily. • Reset Weekly. • Reset Hourly. • Timed Reset.
Client Reconnect Timeout	If ‘Timed Reset’ is selected, this is the period for which the client will have to wait before reconnecting.
Reset Day	If Reset Weekly is selected, this is the day the reset will be applied.
Reset Hour	If Reset Weekly or Reset Daily is select, this is the hour and day the reset will be applied.

Note: Time tracking shall be accounted for on a per-policy basis, such that a client connected to any SSID assigned the time tracking policy will accrue a common counter, regardless of which SSID they are connected to (as long as those SSIDs all share the same time tracking policy).

Banned Clients

Click on **Banned Clients** to view the list of the clients that have been banned after time disconnect feature has taken effect, these clients will not be allowed to connect back until timeout reset or you can unblock a client by clicking on the icon  .




Banned Clients			
MAC Addresses	Time Policy	Release Time	Actions
A0:CB:FD:F4:DF:FE	5minute	2017-08-24 11:40:00	
30:75:12:FF:37:89	5minute	2017-08-24 11:40:00	
DC:09:4C:A4:38:BE	5minute	2017-08-24 11:41:00	

Figure 35: Ban/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.



Add

Common Name	<input type="text" value="CATest"/>
Key Length	<input style="border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 100%;" type="text" value="2048"/>
Digest Algorithm	<input style="border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 100%;" type="text" value="SHA256"/>
Lifetime (days)	<input type="text" value="120"/>
Country Code	<input style="border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 100%;" type="text" value="MA"/>
State or Province	<input type="text" value="Casablanca"/>
City	<input type="text" value="Casablanca"/>
Organization	<input type="text" value="GS"/>
Organization Unit	<input type="text" value="Gs"/>
Email Address	<input type="text" value="grandstream@gmail.com"/>



Figure 36: Create CA Certificate

Table 22: 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: <ul style="list-style-type: none"> 1024: 1024-bit keys are no longer sufficient to protect against attacks. 2048: 2048-bit keys are a good minimum. (Recommended).



	<ul style="list-style-type: none"> • 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	<p>Choose the digest algorithm:</p> <ul style="list-style-type: none"> • 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)	<p>Enter the validity date for the CA certificate in days. In our example, set to “120”.</p>
Country Code	<p>Select a country code from the dropdown list. Example: “MA”.</p>
State or Province	<p>Enter a state name or province. Example: “Casablanca”.</p>
City	<p>Enter a city name. Example: “Casablanca”.</p>
Organization	<p>Enter the organization name. Example: “GS”.</p>
Organization Unit	<p>Enter the organization unit name. Example: “Gs”.</p>
Email Address	<p>Enter an email address. Example: “grandstream@gmail.com”</p>

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”.



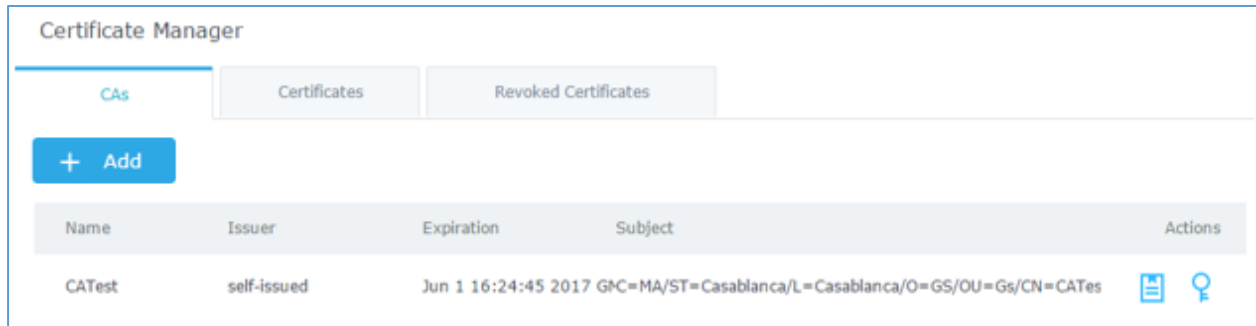



Figure 37: CA Certificate

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.



Add

Common Name	<input type="text" value="ServerCertificate"/>
CA Certificate	<input style="border-bottom: 1px solid #ccc;" type="text" value="CATest"/>
Certificate Type	<input style="border-bottom: 1px solid #ccc;" type="text" value="Server"/>
Key Length	<input style="border-bottom: 1px solid #ccc;" type="text" value="2048"/>
Digest Algorithm	<input style="border-bottom: 1px solid #ccc;" type="text" value="SHA256"/>
Lifetime (days)	<input type="text" value="120"/>
Country Code	<input style="border-bottom: 1px solid #ccc;" type="text" value="MA"/>
State or Province	<input type="text" value="Casablanca"/>
City	<input type="text" value="Casablanca"/>
Organization	<input type="text" value="GS"/>
Email Address	<input type="text" value="cert@grandstream.com"/>

Figure 38: Generate Server Certificates

Table 23: 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	<p>Choose the certificate type from the drop-down list. It can be either a client or a server certificate.</p> <p>Choose “Server” to generate server certificate.</p>
Key Length	<p>Choose the key length for generating the server certificate.</p> <p>Following values are available:</p> <ul style="list-style-type: none"> • 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	<p>Choose the digest algorithm:</p> <ul style="list-style-type: none"> • 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)	<p>Enter the validity date for the server certificate in days.</p> <p>In our example, set to “120”.</p>
Country Code	<p>Select a country code from the dropdown list.</p> <p>Example: “MA”.</p>
State or Province	<p>Enter a state name or province.</p> <p>Example: “Casablanca”.</p>
City	<p>Enter a city name.</p> <p>Example: “Casablanca”.</p>
Organization	<p>Enter the organization name.</p> <p>Example: “GS”.</p>
Email Address	<p>Enter an email address.</p> <p>Example: “Cert@grandstream.com”.</p>

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



Click on  button to export the server certificate file in “.cert” 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 (.cert and .key) will be used by the GWN7000 when acting as a server.
- The server certificates (.cert and .key) can be exported and used on another OpenVPN® server.

❖ **Creating Client Certificate**

To create client certificate, follow below steps:

1- Create Users

- Navigate to “**System Settings**→**User Manager**”.
- Click on  button. The following window will pop up.

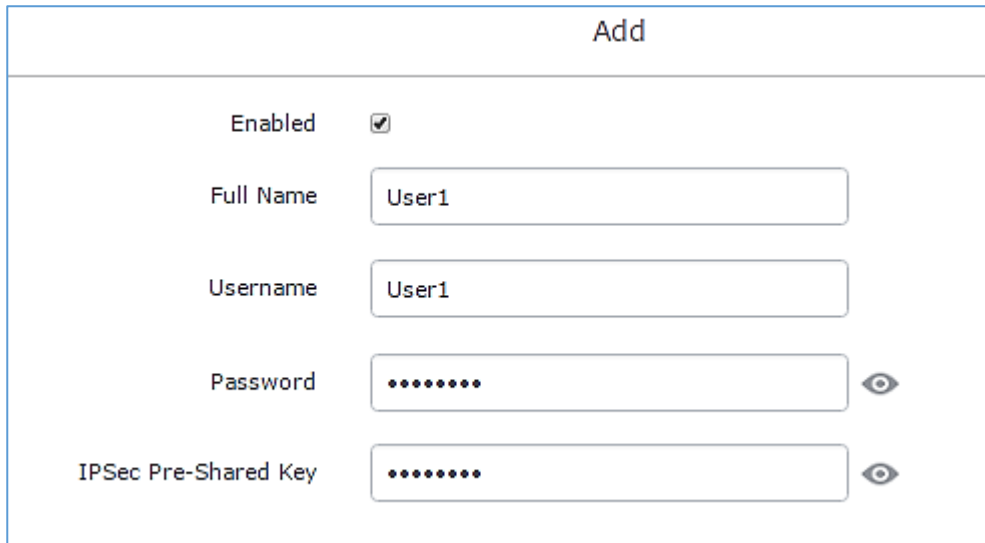


Figure 39: User Management

- 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.



Add

Common Name	<input type="text" value="ClientCertificate"/>
CA Certificate	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="CATest"/> ▼
Certificate Type	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="Client"/> ▼
Username	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="User1"/> ▼
Key Length	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="2048"/> ▼
Digest Algorithm	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="SHA256"/> ▼
Lifetime (days)	<input type="text" value="120"/>
Country Code	<input style="text-align: right; border-bottom: 1px solid #ccc; border-right: 1px solid #ccc; border-left: 1px solid #ccc; border-top: 1px solid #ccc; width: 20px; font-size: 0.8em; vertical-align: middle;" type="text" value="MA"/> ▼
State or Province	<input type="text" value="Casablanca"/>
City	<input type="text" value="Casablanca"/>
Organization	<input type="text" value="GS"/>
Email Address	<input type="text" value="user@grandstream.com"/>

Figure 40: Client Certificate


Table 24: Client Certificate


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	<p>Choose the key length for generating the client certificate.</p> <p>Following values are available:</p> <ul style="list-style-type: none"> • 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	<p>Choose the digest algorithm:</p> <ul style="list-style-type: none"> • 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)	<p>Enter the validity date for the client certificate in days.</p> <p>Example: "120".</p>
Country Code	<p>Select a country code from the dropdown list.</p> <p>Example: "MA".</p>
State or Province	<p>Enter a state name or province.</p> <p>Example: "Casablanca".</p>
City	<p>Enter a city name.</p> <p>Example: "Casablanca".</p>
Organization	<p>Enter the organization name.</p> <p>Example: "GS".</p>
Email Address	<p>Enter an email address.</p> <p>Example: "user@grandstream.com".</p>

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.



Add

Enabled

VPN Name

Server Mode

Protocol

Interface

Local Port

Encryption Algorithm

Digest Algorithm

TLS Authentication

Certificate Authority

Server Certificate

IPv4 Tunnel Network

Redirect Gateway

Automatic Firewall Rule

Auto Forward Group Traffic

LZO Compression

Allow Peer to Change IP

Figure 41: Create OpenVPN® Server

Table 25: 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:



	<ul style="list-style-type: none"> • 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  after completing all the fields.
3. Click  on top of the WebGUI in order to apply changes.

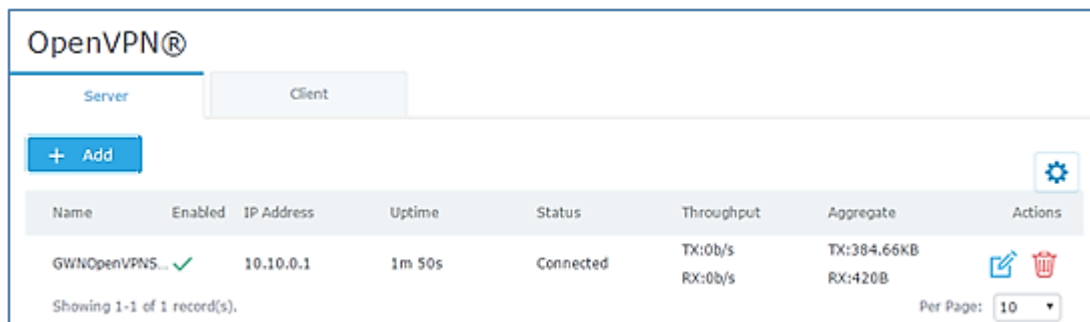



Figure 42: OpenVPN®



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.

Add

Enabled

VPN Name

Protocol

Interface

Local Port

Remote OpenVPN® Server

Remote OpenVPN® Server Port

Auth Mode

Encryption Algorithm


Digest Algorithm

TLS Authentication

Auto Forward Group Traffic

Network Group

group0

Routes 

Don't Pull Routes

Force Default Route through S...

IP Masquerading

LZO Compression

Allow Peer to Change IP

CA Certificate

Client Certificate

Client Private Key

Client Private Key Password

Figure 43: OpenVPN® Client



Table 26: 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	<p>Choose the server mode the OpenVPN® server will operate with, 4 modes are available:</p> <ul style="list-style-type: none"> • 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  after completing all the fields.
3. Click  on top of the webGUI in order to apply changes.

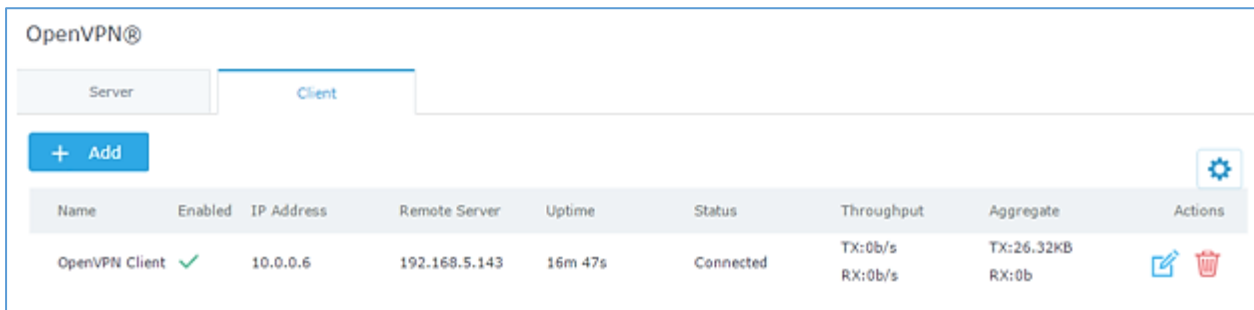



Figure 44: OpenVPN® Client

L2TP/IPSEC Configuration

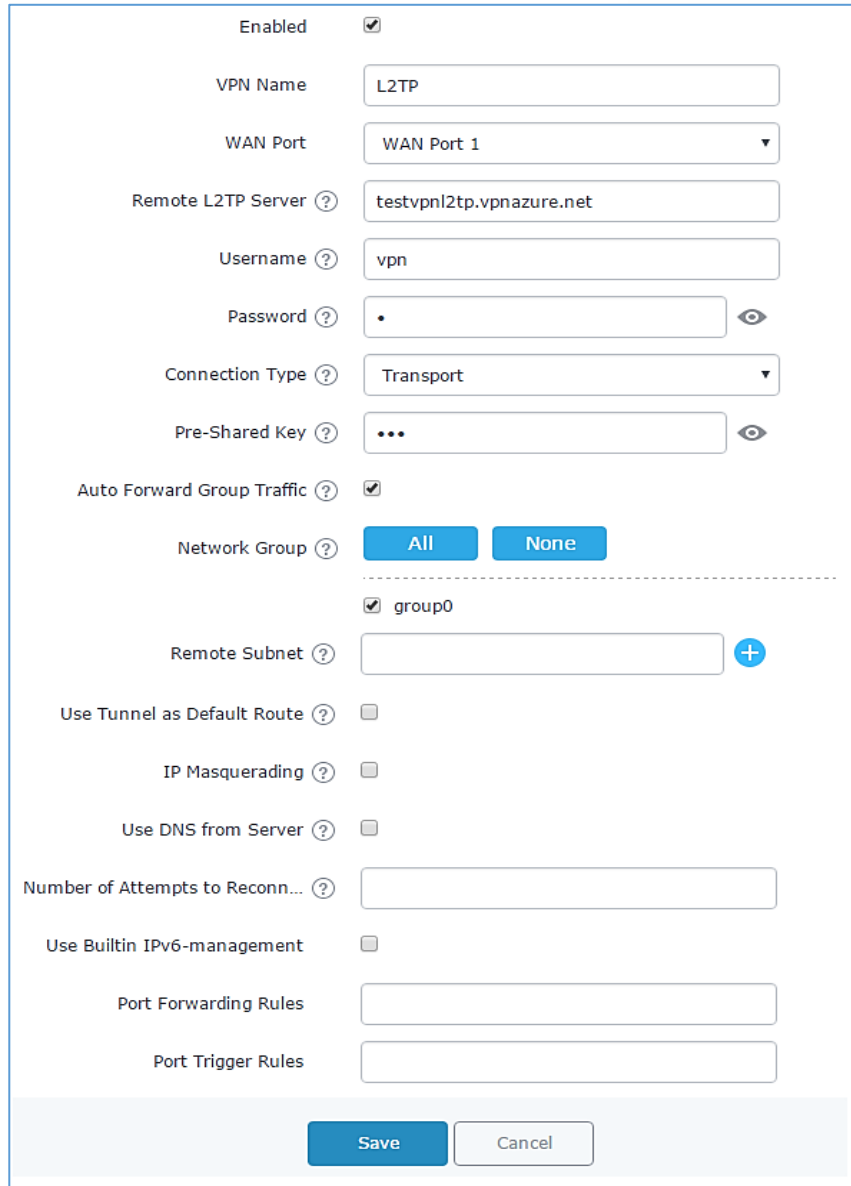
Layer 2 Tunneling Protocol (L2TP) is a tunneling protocol used to support virtual private networks (VPNs) or as part of the delivery of services by ISPs. It does not provide any encryption or confidentiality by itself. Rather, it relies on an encryption protocol that it passes within the tunnel to provide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





The screenshot shows the L2TP Client Configuration interface. It includes the following fields and controls:

- Enabled:**
- VPN Name:** L2TP
- WAN Port:** WAN Port 1
- Remote L2TP Server:** testvpn12tp.vpnazure.net
- Username:** vpn
- Password:** [Masked]
- Connection Type:** Transport
- Pre-Shared Key:** [Masked]
- Auto Forward Group Traffic:**
- Network Group:** All (selected), None
- Remote Subnet:** [Empty] (+)
- Use Tunnel as Default Route:**
- IP Masquerading:**
- Use DNS from Server:**
- Number of Attempts to Reconn...:** [Empty]
- Use Builtin IPv6-management:**
- Port Forwarding Rules:** [Empty]
- Port Trigger Rules:** [Empty]

Buttons: Save, Cancel

Figure 45: L2TP Client Configuration


Table 27: 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	<p>Select either Transport mode or Tunnel mode:</p> <ul style="list-style-type: none"> • 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	<p>Configures the remote subnet for the VPN.</p> <p>The format should be "IP/Mask" where IP could be either IPv4 or IPv6 and mask is a number between 1 and 32.</p> <p>For example: 192.168.5.0/24</p>
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  after completing all the fields.

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



Name	Enab...	IP Address	Remote Server	Username	Uptime	Status	Throughput	Aggregate	Actions
L2TP	✓	none	testvpn12tp.vpnazure.net	vpn		Connecting	TX:0b/s RX:0b/s	TX:83.77KB RX:0b	 

Showing 1-1 of 1 record(s). Per Page: 10 ▼


Figure 46: 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.




Add

Enabled

VPN Name

Remote PPTP Server

Username

Password 


Auto Forward Group Traffic

Network Group

WAN Port 1

WAN Port 2

group0

Subnet 

Use Tunnel as Default Route

IP Masquerading

Use DNS from Server

Number of Attempts to Reconnect

Use Builtin IPv6-management

MPPE

Port Forwarding Rules

Port Trigger Rules

Figure 47: PPTP Client Configuration


Table 28: 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.
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.
MPPE	Enable / disable the MPPE for data encryption. By default, it's disabled.
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  after completing all the fields.

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





+ Add 								
Name	Enabl...IP Address	Remote Server	Username	Uptime	Status	Throughput	Aggregate	Actions
PPTP VPN ✓	172.16.36.97	euro214.vpnbook.com	vpnbook	23m 31s	Connected	TX:0b/s RX:0b/s	TX:512B RX:616B	 
Showing 1-1 of 1 record(s). Per Page: 10 ▼								

Figure 48: PPTP Client



GWN7000 PPTP Server Configuration

To configure PPTP server on the GWN7000, go to “**VPN→PPTP→Server**” and set the following:

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

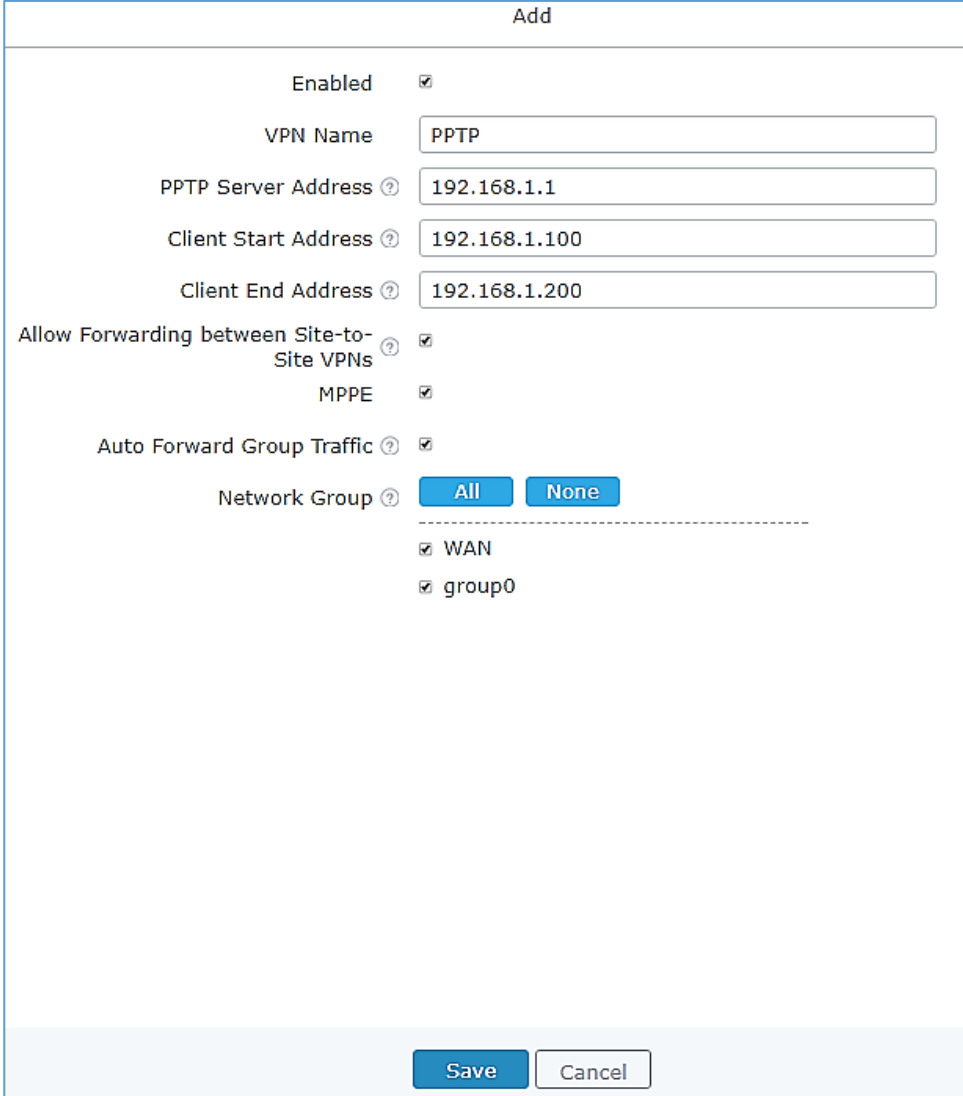




Figure 49: PPTP Server Configuration

Table 29: PPTP Server Configuration Parameters

Field	Description
Enable	Click on the checkbox to enable the PPTP VPN Server.
VPN Name	Enter a name for the PPTP Server.
PPTP Server Address	Configure the PPTP server local address (ex: 192.168.1.1).



Client Start Address	<p>Configure the remote client IP start address.</p> <p>Note: this address should be in the same subnet as the end address and PPTP server address.</p>
Client End Address	<p>Configure the remote client IP end address.</p> <p>Note: this address should be in the same subnet as the start address and PPTP server address.</p>
Allow Forwarding between Site-To-Site VPNs	<p>This option allows forwarding between multiple site-to-site VPNs. i.e. if there are multiple PPTP users configured with client subnet enabled, then this option allows one PPTP client subnet to access another PPTP client subnet through the server.</p> <p>Note: for this option to work more than one PPTP users with client subnet must be enabled.</p>
MPPE	<p>Enable / disable the MPPE for data encryption. By default, it's disabled.</p>
Auto Forward group traffic	<p>Configures if enable group traffic forwards to be automatic. If enabled, users should choose which groups they want to forward, if not, users can still do it manually via forwarding rules under firewall settings.</p> <p>Note: if cancel check, the previous group settings will be cleared, user need to re-configure the groups.</p>
Network Group	<p>Configure the network group to access VPN connection, you can choose more than one network group at the same time.</p>

- 2- Click  after completing all the fields.
- 3- Click  on top of the web GUI to apply changes.

After this step, you need to create user accounts under web GUI → **System Settings** → **User Manager** in order to connected to the configured PPTP server.



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




General Settings	Port Forward	DMZ	Inter-group Traffic Forwarding	UPnP Settings	UPnP Status
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <p>SYN Flood Protection <input checked="" type="checkbox"/></p> <p>SYN Flood Rate Limit (packets/second) <input style="width: 100%;" type="text" value="50"/></p> <p>SYN Flood Burst Limit <input style="width: 100%;" type="text" value="100"/></p> <p>Drop Invalid Packets <input checked="" type="checkbox"/></p> </div> </div>					

Figure 50: 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  .







Firewall Basic Settings								
General Settings	Port Forward	DMZ	Inter-group Traffic Forwarding	UPnP Settings	UPnP Status			
+ Add								
Name	Enabled	Protocol	Src Group	Src Port(s)	Dest Group	Dest IP	Dest Port(s)	Actions
HTTPs	✓	TCP/UDP	WAN Port 1	7777	group0	192.168.1.1	443	 
GWN7610	✓	TCP/UDP	WAN Port 1	8888	group0	192.168.1.76	443	 

Figure 51: Port Forward




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

Table 30: 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 .



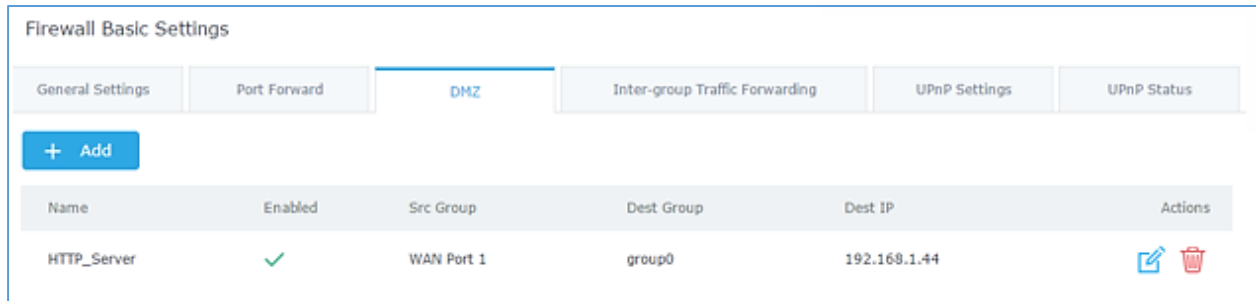


Figure 52: DMZ

Refer to below table for DMZ fields:

Table 31: 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.

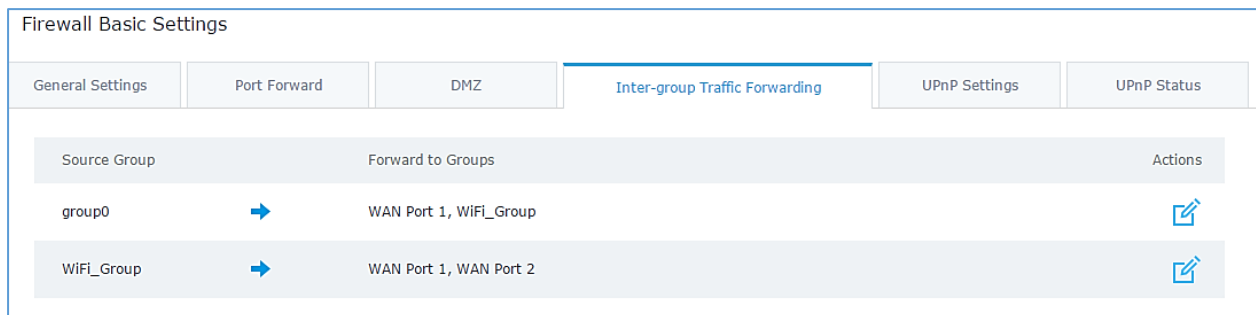





Figure 53: Inter-group Traffic Forwarding

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



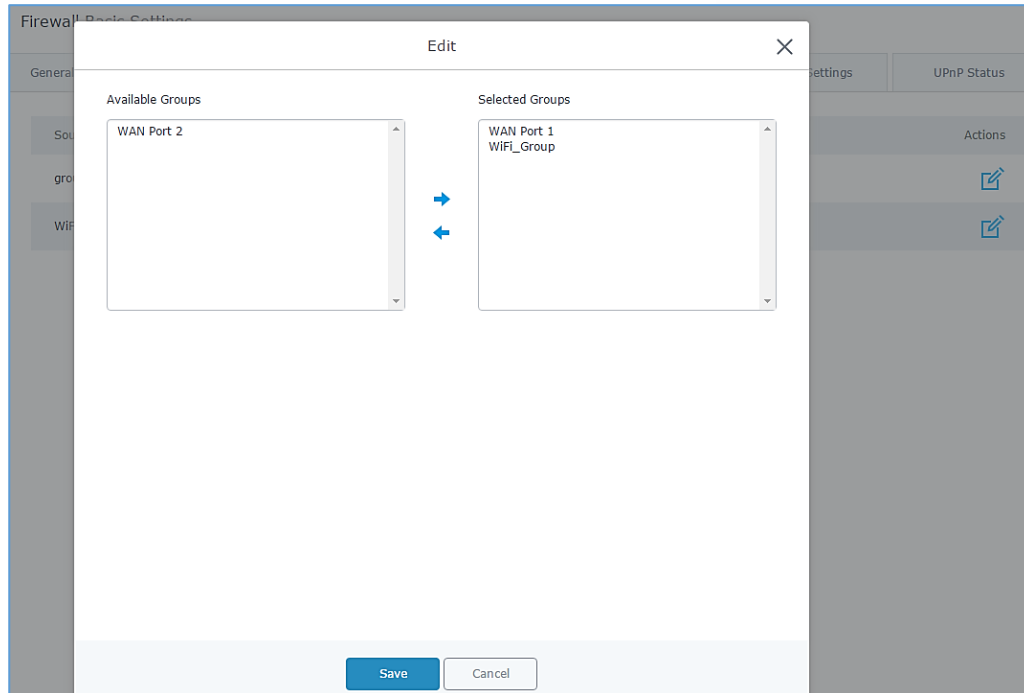


Figure 54: Enabling inter-group traffic

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 32: 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.

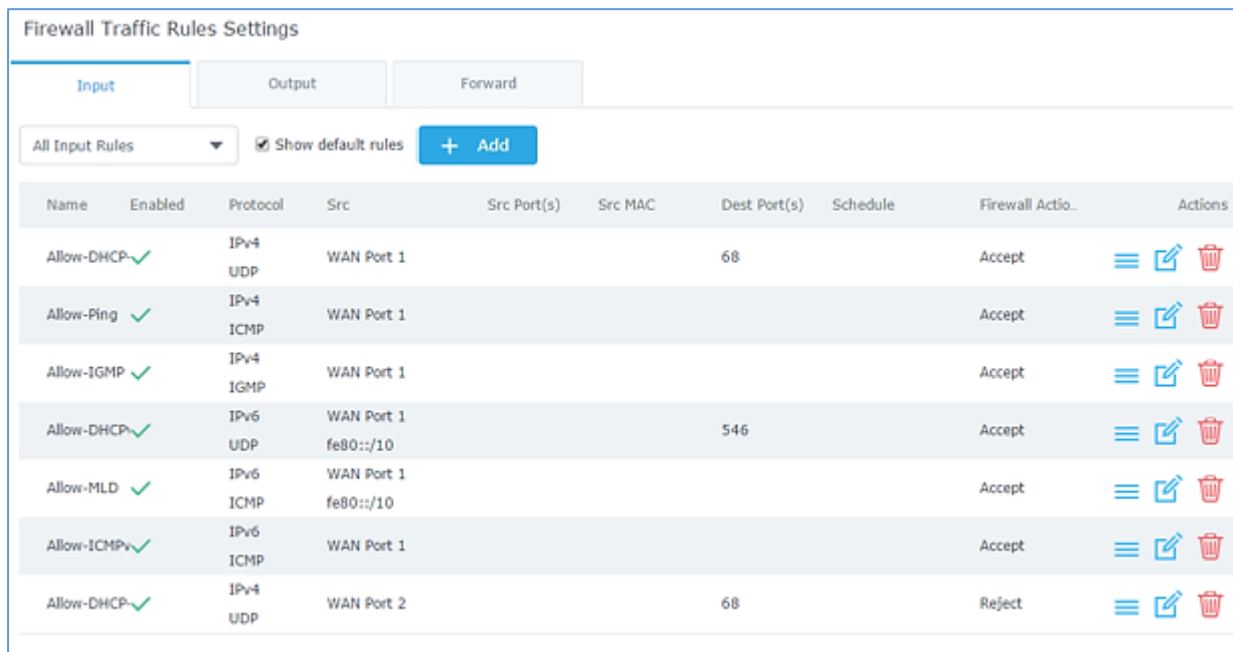


Traffic Rules Settings

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 .
- To edit a rule, Click on .
- To delete a rule, Click on .



The screenshot shows the 'Firewall Traffic Rules Settings' interface. It has three tabs: 'Input', 'Output', and 'Forward'. The 'Input' tab is active. Below the tabs, there is a dropdown menu set to 'All Input Rules', a checkbox for 'Show default rules' which is checked, and a '+ Add' button. The main area contains a table with the following columns: Name, Enabled, Protocol, Src, Src Port(s), Src MAC, Dest Port(s), Schedule, Firewall Actio..., and Actions.

Name	Enabled	Protocol	Src	Src Port(s)	Src MAC	Dest Port(s)	Schedule	Firewall Actio...	Actions
Allow-DHCP	✓	IPv4 UDP	WAN Port 1			68		Accept	☰ ✎ 🗑️
Allow-Ping	✓	IPv4 ICMP	WAN Port 1					Accept	☰ ✎ 🗑️
Allow-IGMP	✓	IPv4 IGMP	WAN Port 1					Accept	☰ ✎ 🗑️
Allow-DHCP	✓	IPv6 UDP	WAN Port 1		fe80::/10	546		Accept	☰ ✎ 🗑️
Allow-MLD	✓	IPv6 ICMP	WAN Port 1		fe80::/10			Accept	☰ ✎ 🗑️
Allow-ICMPv	✓	IPv6 ICMP	WAN Port 1					Accept	☰ ✎ 🗑️
Allow-DHCP	✓	IPv4 UDP	WAN Port 2			68		Reject	☰ ✎ 🗑️





Figure 55: Traffic Rules Settings

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

Table 33: 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.
Destination IP	Set the destination IP address, it can be an IPv4 or IPv6 address.
Destination Port(s)	Set the destination's port(s).
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 5 th , 10 th and 15 th 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 34: 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 35: 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 5 th , 10 th and 15 th 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  .
- 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 36: 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 5 th , 10 th and 15 th 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.



CAPTIVE PORTAL

Captive Portal feature on GWN7000 Router allows to define a Landing Page (Web page) that will be displayed on Wi-Fi clients' browsers when attempting to access Internet. Once connected to a GWN76xx AP paired with the router, Wi-Fi clients will be forced to view and interact with that landing page before Internet access is granted.

The Captive Portal feature can be configured from the GWN7000 Web page, by navigating to "Captive Portal".

The page contains three tabs: **Policy**, **Files** and **Clients**.

Policy Configuration Page

The policy configuration page contains options for authentication type used when enabling the captive portal feature. The following table describes all the settings on this page:

Table 37: Basic Configuration Page

Field	Description
Name	Enter a name to identify the created landing page.
Expiration	Enter the expiration time for the landing page, this field must contain an integer between from 60 to 604800 (in minutes). If this field is set to 0 the landing page will never expire.
Authentication Type	Choose the authentication type from dropdown list, three types of authentication are available: <ul style="list-style-type: none"> No Authentication: when choosing this option, the landing page feature will not provide any type of authentication, it will instead prompt users to accept the license agreement to gain access to internet. RADIUS Server: choosing this option will allow users to set a RADIUS server to authenticate clients connected to the router. WeChat: choosing this option will allow users to log in using WeChat app.
RADIUS Server Address	Enter the IP address or the FQDN of the RADIUS server used for authenticating clients.
RADIUS Server Port	Enter the RADIUS server port, by default tis 1812.



RADIUS Server Secret	Enter the shared key between authenticator and RADIUS server.
ShopId	Enter the ShopId for WeChat.
AppId	Enter the AppId for WeChat.
SecretKey	Enter the SecretKey for WeChat authentication.
Portal Page Customization	<p>This option provides users to choose the landing page that will be shown once a client tries to connect to the GWN, two pages are available:</p> <ul style="list-style-type: none"> • Portal Default: This page is used when no authentication is specified, users will only need to accept license agreement to gain access to internet. • Portal Pass: This option provides authentication textbox when using RADIUS authentication mode, in order to enter username and identity stored in RADIUS database.

Files Configuration Page

Files configuration page allows users to view and upload HTML pages and related files (images...).

The captive portal uses two HTML pages using authentication scenarios, either **portal_default.html** which doesn't provide authentication and is only accepting license agreement, while **portal_pass.html** provides textboxes for authentication, Wired or Wi-Fi clients will be redirected to one of these pages before accessing Internet.

The following figure shows **portal_default.html** page:



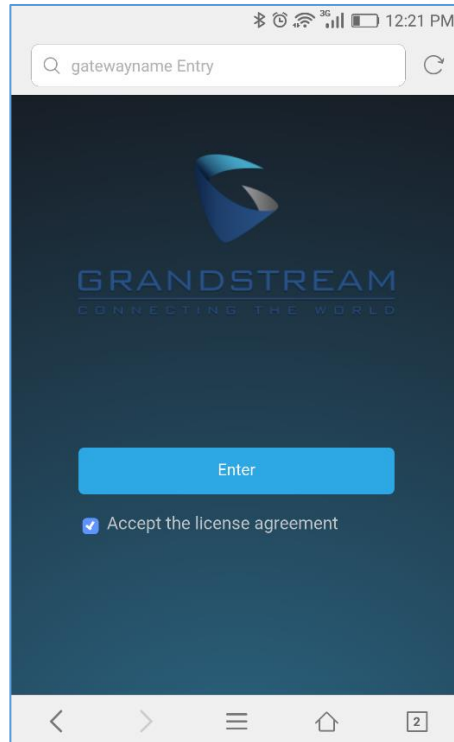


Figure 56: portal_default.html page

The following figure shows **portal_pass.html** page:

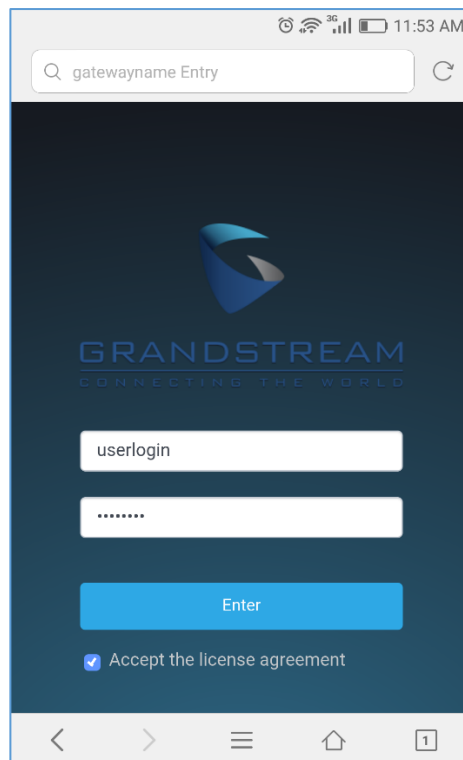


Figure 57: portal_pass.html page



The following figure shows default files used for Captive Portal:

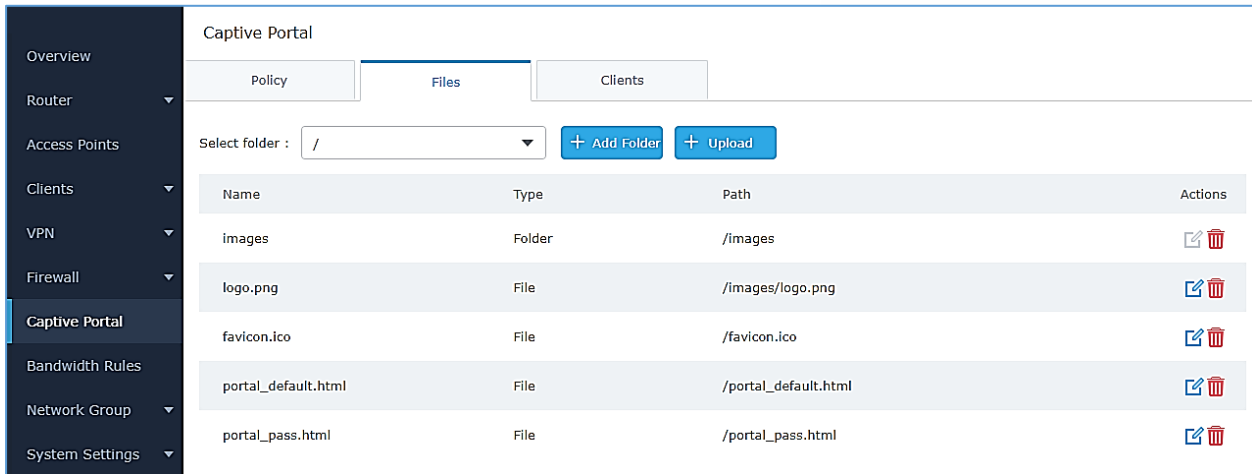
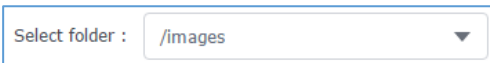


Figure 58: Files Settings Page

- Click to upload a new Web page.
- Click to add a new folder.
- Click to upload files to the selected folder.

- Folder can be selected from the dropdown list 

Clients Page

Clients page lists MAC addresses of authenticated devices using captive portal.

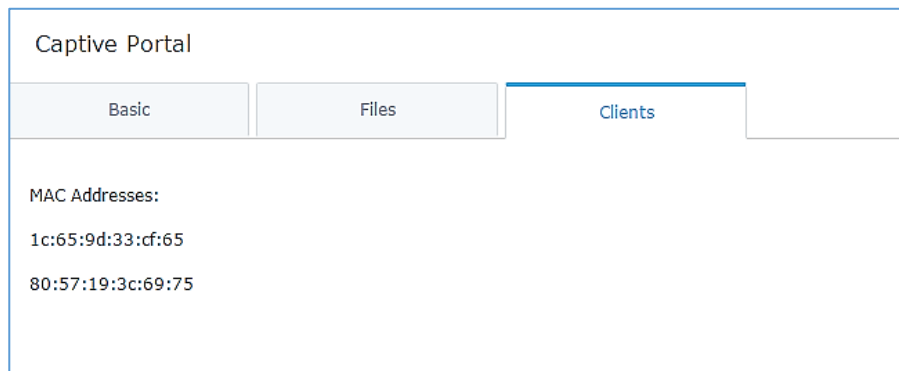


Figure 59: Client Web Page



BANDWIDTH RULES

The bandwidth rule is a GWN7000 feature that allows users to limit bandwidth utilization per SSID, MAC address or IP address.

This option can be configured from the GWN7000 WebGUI under “Bandwidth Rules”.


Click  to add a new rule, the following table provides an explanation about different options for bandwidth rules.

Table 38: Bandwidth Rules

Field	Description
Type	Choose the type of rules to apply for bandwidth utilization from the dropdown list, three options are available: <ul style="list-style-type: none"> SSID: Set a bandwidth limitation on the SSID level. MAC: Set a bandwidth limitation per MAC address. IP Address: Set a bandwidth limitation per IP address.
SSID	Select the SSID to which the limitation will be applied, this option appears only when SSID type is selected.
MAC	Enter the MAC address of the device to which the limitation will be applied, this option appears only when MAC type is selected.
IP address	Enter the IP address of the device to which the limitation will be applied, this option appears only when IP Address type is selected.
Network Group	Choose the network group to which belongs the device, this option is available when choosing either MAC or IP address type.
Upstream Rate	Specify the limit for the upload bandwidth using Kbps or Mbps.
Downstream Rate	Specify the limit for the download bandwidth using Kbps or Mbps.

The following figure shows an example of MAC address rule limitation.



Add ✕

Type	<input type="text" value="MAC"/>	
MAC	<input type="text" value="00:0b:82:15:af:19"/>	
Network Group	<input type="text" value="group0"/>	
Upstream Rate	<input type="text" value="10"/>	<input type="text" value="Mbps"/>
Downstream Rate	<input type="text" value="75"/>	<input type="text" value="Mbps"/>

Figure 60: MAC Address Bandwidth rule

The following figure shows examples of bandwidth rules:

+ Add					
Type	SSID/MAC/IP Address	Network Group	Upstream Rate	Downstream Rate	Actions
SSID	GWN		500Kbps	12Mbps	✎ ✖
MAC	00:0B:82:15:AF:19	group0	10Mbps	75Mbps	✎ ✖
IP Address	192.168.1.155	group0	100Kbps	100Kbps	✎ ✖

Figure 61: Bandwidth Rules



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 39: Maintenance

Basic	
Web WAN Access	Enable the web WAN access. By default, it's disabled
Web HTTP Access	Enable the web HTTP Access. By default, it's disabled.
Web HTTPS Port	Specifies the HTTPS port. By default, is 443.
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.

Logserver

The logserver page allows the user to configure syslog server on GWN7000 in order to save log messages on connected external USB drive.

First connect a USB drive to the Access point, then configure the parameters and make sure to start the server in order to collect messages from devices sending syslog to GWN.

Following table gives description for configuration parameters of GWN Logserver:

Option	Description
Enable WAN Firewall Rule	Enable WAN Firewall rules to allow incoming syslog messages to the router.
Logrotate File Size	Select the size of file to trigger rotation, if left empty, then the router will use only the Logrotate frequency rules to trigger rotation.
Logrotate File Count	Select the Maximum number of rotates files to keep. Default is 56 files.
Logrotate Mode	Choose the time rotation frequency mode (default every 3 hours). <ul style="list-style-type: none"> • Every X hours (0-23) • Every X Minutes (0-59).



	<ul style="list-style-type: none"> • X hour of day (0-23). • X day of week (Sunday-Saturday) + X hour of day (0-23).
Hours	Enter the number of hours period after which trigger file rotation.
Minutes	Enter the number of Minutes period after which trigger file rotation.
Hour of the day	Enter the hour of day at which trigger file rotation.
Day of the week	Enter Day of the week + hour of day, at which trigger file rotation.
Devices	Select the path (a USB partition) to store collected logs. Required.
Enable Logserver	Enables the logserver

After settings up the logserver and saving the settings, users need to connect a USB external storage and press Start button in order to start collecting logs.

All log messages from all devices will be put on one single file, and the router will keep rotating and creating new files based on the configured rotation policy.



Maintenance

Basic Upgrade Access Syslog **Logserver**

Enable the WAN Firewall Rule WAN Port 1
 WAN Port 2

Logrotate File Size M

Logrotate File Count

Logrotate Mode

Hours

Devices

Enable Logserver

Status: Active

Syslog File List

Device

File Name	File Size	Last Modified	Actions
logserver.log	71 B	08-30-2017 09:56:11	<input type="button" value="Download"/> <input type="button" value="Delete"/>

Showing 1-1 of 1 record(s). Per Page:

Figure 62: Logserver Configuration

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

Click on 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.

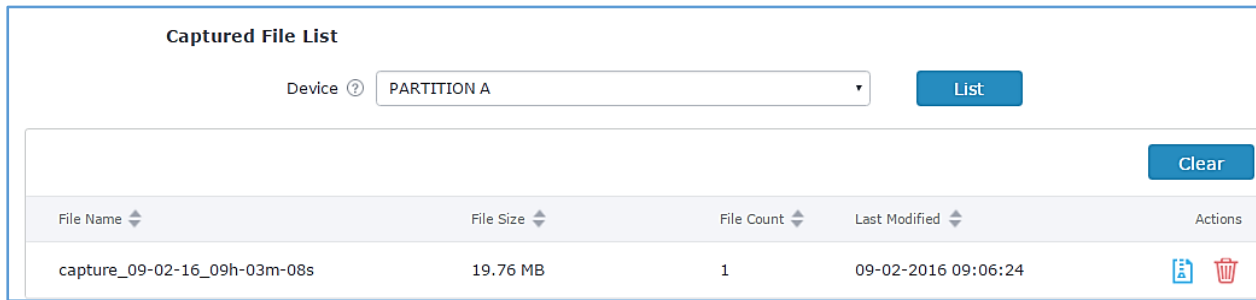


Figure 63: Capture Files

The below table will show different fields used on capture page

Table 40: Debug-Capture

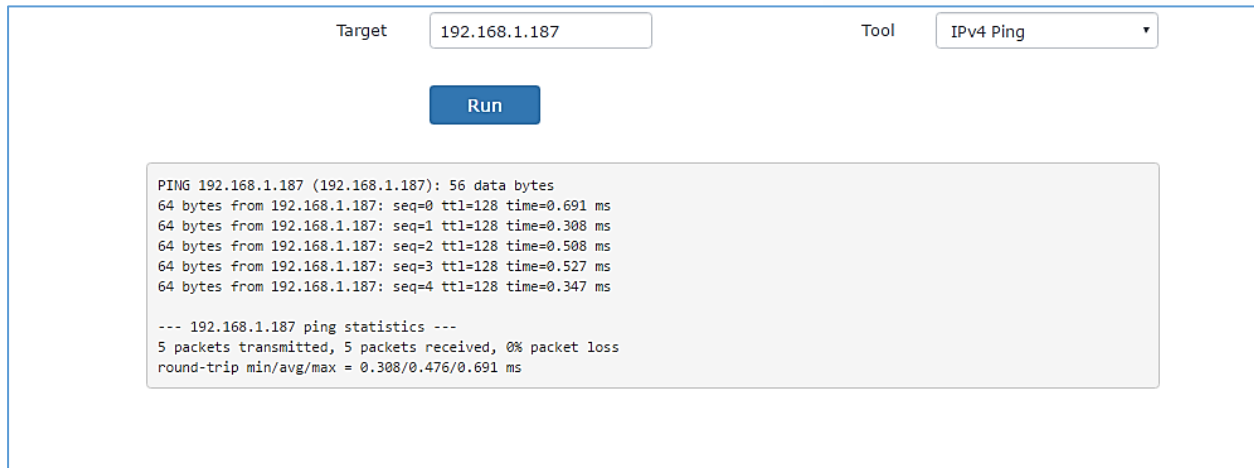
File Name	Enter the name of the capture file that will be generated.
Interface	Choose an Interface (WAN port1 or 2, or a network group) from where to begin the capture.
Device	Choose a device plugged to USB port to save the capture once started.
File Size	Set a File size that the capture will not exceed (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 chosen 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**.



```
PING 192.168.1.187 (192.168.1.187): 56 data bytes
64 bytes from 192.168.1.187: seq=0 ttl=128 time=0.691 ms
64 bytes from 192.168.1.187: seq=1 ttl=128 time=0.308 ms
64 bytes from 192.168.1.187: seq=2 ttl=128 time=0.508 ms
64 bytes from 192.168.1.187: seq=3 ttl=128 time=0.527 ms
64 bytes from 192.168.1.187: seq=4 ttl=128 time=0.347 ms

--- 192.168.1.187 ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 0.308/0.476/0.691 ms
```

Figure 64: 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**.



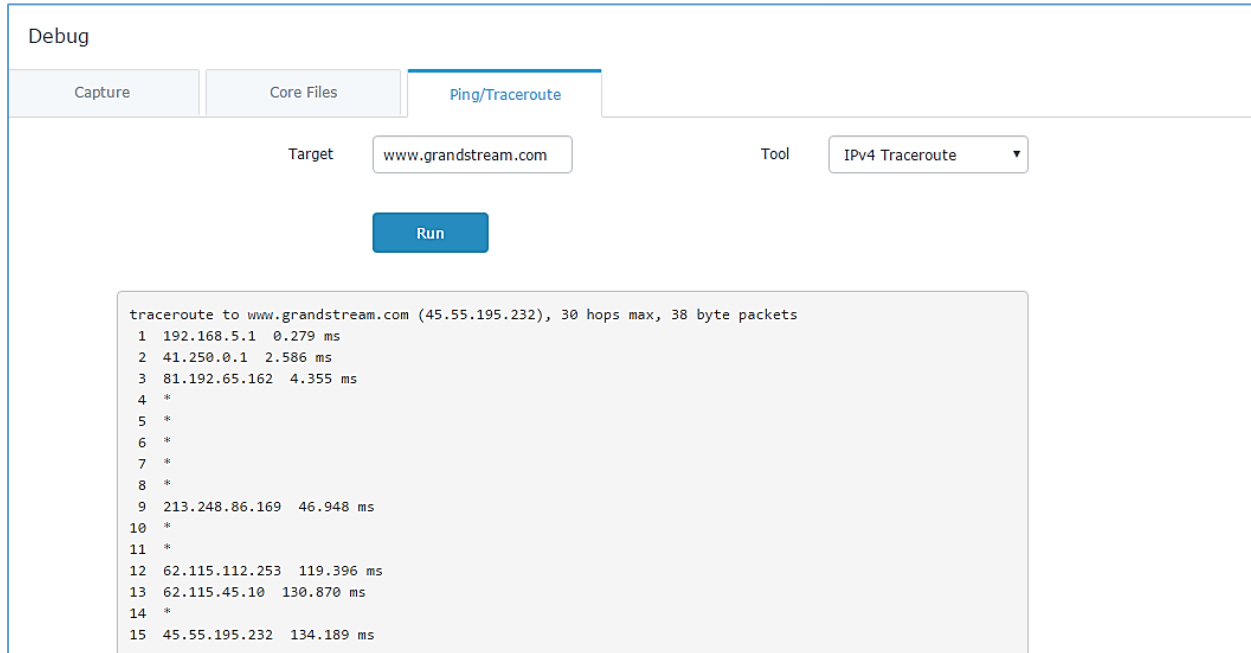


Figure 65: Traceroute

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**.



- Overview
- Router
- Access Points
- Clients
- VPN
- Firewall
- Captive Portal
- Bandwidth Rules
- Network Group
- System Settings
- Maintenance
- Debug
- Email/Notification
- LEDs
- Cert. Manager
- File Sharing
- SNMP

Debug

Capture
Core Files
Ping/Traceroute
Syslog
NAT Table

1. Mon Sep 11 16:06:42 2017 user.debug syslog: nbrd: rcv nbrcom data len=296 from 00:0b:82:8b:4d:d4, send to module 2
2. Mon Sep 11 16:06:42 2017 user.debug syslog: DBG: module_id=002, socket=5, dst=/var/run/unix_domain_hostapd.sock
3. Mon Sep 11 16:06:42 2017 user.debug syslog: DBG: gs_msg_sendto: socket=5
4. Mon Sep 11 16:06:42 2017 user.err syslog: DBG: Sending packet failed: sockfd=5, send_len=-1, err=No such file or directory
5. Mon Sep 11 16:06:44 2017 user.debug syslog: nbrd: parse_data_l2: ap_msg=0x5
6. Mon Sep 11 16:06:44 2017 user.debug syslog: nbrd: rcv nbrcom data len=296 from 00:0b:82:8b:4d:d4, send to module 2
7. Mon Sep 11 16:06:44 2017 user.debug syslog: DBG: module_id=002, socket=5, dst=/var/run/unix_domain_hostapd.sock
8. Mon Sep 11 16:06:44 2017 user.debug syslog: DBG: gs_msg_sendto: socket=5
9. Mon Sep 11 16:06:44 2017 user.err syslog: DBG: Sending packet failed: sockfd=5, send_len=-1, err=No such file or directory
10. Mon Sep 11 16:06:44 2017 user.debug syslog: nbrd: parse_data_l2: ap_msg=0x5
11. Mon Sep 11 16:06:44 2017 user.debug syslog: nbrd: rcv nbrcom data len=296 from 00:0b:82:8b:4d:d4, send to module 2
12. Mon Sep 11 16:06:44 2017 user.debug syslog: DBG: module_id=002, socket=5, dst=/var/run/unix_domain_hostapd.sock
13. Mon Sep 11 16:06:44 2017 user.debug syslog: DBG: gs_msg_sendto: socket=5
14. Mon Sep 11 16:06:44 2017 user.err syslog: DBG: Sending packet failed: sockfd=5, send_len=-1, err=No such file or directory
15. Mon Sep 11 16:06:45 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
16. Mon Sep 11 16:06:45 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
17. Mon Sep 11 16:06:45 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
18. Mon Sep 11 16:06:45 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
19. Mon Sep 11 16:06:50 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
20. Mon Sep 11 16:06:50 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0
21. Mon Sep 11 16:06:50 2017 daemon.debug controller: ifstat_read: 0 - 0 = 0

Figure 66: Syslog

NAT Table

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



Capture	Core Files	Ping/Traceroute	Syslog	NAT Table			
IPv4 Connections							
Protocol	Expires	Source	Destination	Source Port	Dest Port	TX / RX Packets	TX / RX Bytes
TCP	9	192.168.5.106	192.168.5.139	49886	443	6 / 6	409B / 828B
TCP	60	192.168.5.106	192.168.5.139	49912	443	7 / 7	1.07KB / 1.62KB
TCP	90	192.168.5.106	192.168.5.139	49935	443	4 / 6	317B / 828B
TCP	60	192.168.5.106	192.168.5.139	49901	443	6 / 6	409B / 828B
UDP	30	127.0.0.1	127.0.0.1	52441	53	1 / 1	53B / 53B
TCP	75	192.168.5.106	192.168.5.139	49926	443	8 / 8	1.58KB / 1.65KB
UDP	45	127.0.0.1	127.0.0.1	47074	53	1 / 1	53B / 53B
TCP	103	192.168.5.106	192.168.5.139	49943	443	7 / 7	1.07KB / 1.64KB
TCP	90	192.168.5.106	192.168.5.139	49936	443	8 / 8	1.58KB / 1.65KB
UDP	0	127.0.0.1	127.0.0.1	59067	53	1 / 1	53B / 53B
IPv6 Connections							
Protocol	Expires	Source	Destination	Source Port	Dest Port	TX / RX Packets	TX / RX Bytes
Showing 1-10 of 140 record(s). 1 2 3 4 5 6 7 8 ... 13 14 ▶ Jump to: <input type="text"/> Go Per Page: <input type="text" value="10"/>							

Figure 67: NAT table

Email/Notification

The Email/Notification page allows the administrator to select a predefined set of system events and to send notifications upon the change of the set events.

Note: A reboot is required in order to activate email notification feature.

Table 41: Email Setting

Filed	Description
Enabled	Enable/disable the email settings. By default, it's disabled
Host	Configures the SMTP Email Server IP or Domain Name.
Port	Specifies the Port number used by server to send email.
Username	Specifies sender's User ID or account ID in the email system used.
Password	Specifies sender's password of the email account.
Email Address	Specifies the email address of the administer where to receive notifications.



The following table describe the notifications configuration settings.

Table 42: Email Events

Filed	Description
Enabled	Enable/disable the notification. By default, it's disabled
Memory Usage	Configures whether to send notification if memory usage is greater than the configured threshold. By default, it's disabled.
Memory Usage Threshold (%)	Specifies the Memory Usage Threshold (%). Must be integer between 1 and 100.
CPU Usage	Configures whether to send notification if CPU usage is greater than the configured threshold. By default, it's disabled.
CPU Usage Threshold (%)	Specifies the CPU Usage Threshold (%). Must be integer between 1 and 100.
Firmware upgrade	Configures whether to send notification on firmware upgrade. Default is disabled.
Add/Remove Network Group	Configures whether to send notification when network groups has been added/removed.
Additional SSID	Configures whether to send notification if any additional SSID is enabled. Default is disabled.
Time Zone Change	Configures whether to send notification on time zone change. Default is disabled.
Administrator Password Change	Configures whether to send notification on admin password change. Default is disabled.
AP Offline	Configures whether to send notification when AP going offline. Default is disabled.

LED Schedule

GWN7000 supports the LED schedule feature. This feature is used to set the timing of the LEDs to stay ON and when they will go OFF at customer's convenience. This can be useful for example when the LEDs become disturbing during some periods of the day. This way with the LED schedule, you can set the timing so that the LEDs turn off at night after specific hours and maintain the Wi-Fi service for other clients without shutting down the AP.

To configure LED schedule, on the GWN7000 WebGUI navigate to "**System Settings**→**LEDs**".

Following options are available:

Table 43: LED Schedule settings

Option	Description
LEDs Always off	Turn off completely the LEDs.



Schedule Start Hour	Configure the hour when LEDs will be automatically turned on.
Schedule Start Minute	Configure the minute when LEDs will be automatically turned on.
Schedule Stop Hour	Configure the hour when LEDs will be automatically turned off.
Schedule Stop Minute	Configure the minute when LEDs will be automatically turned off.
Schedule weekdays list	Choose the days for which you want to schedule the LEDs.

Following example set the LEDs to be turned on from 8am till 8pm every day:

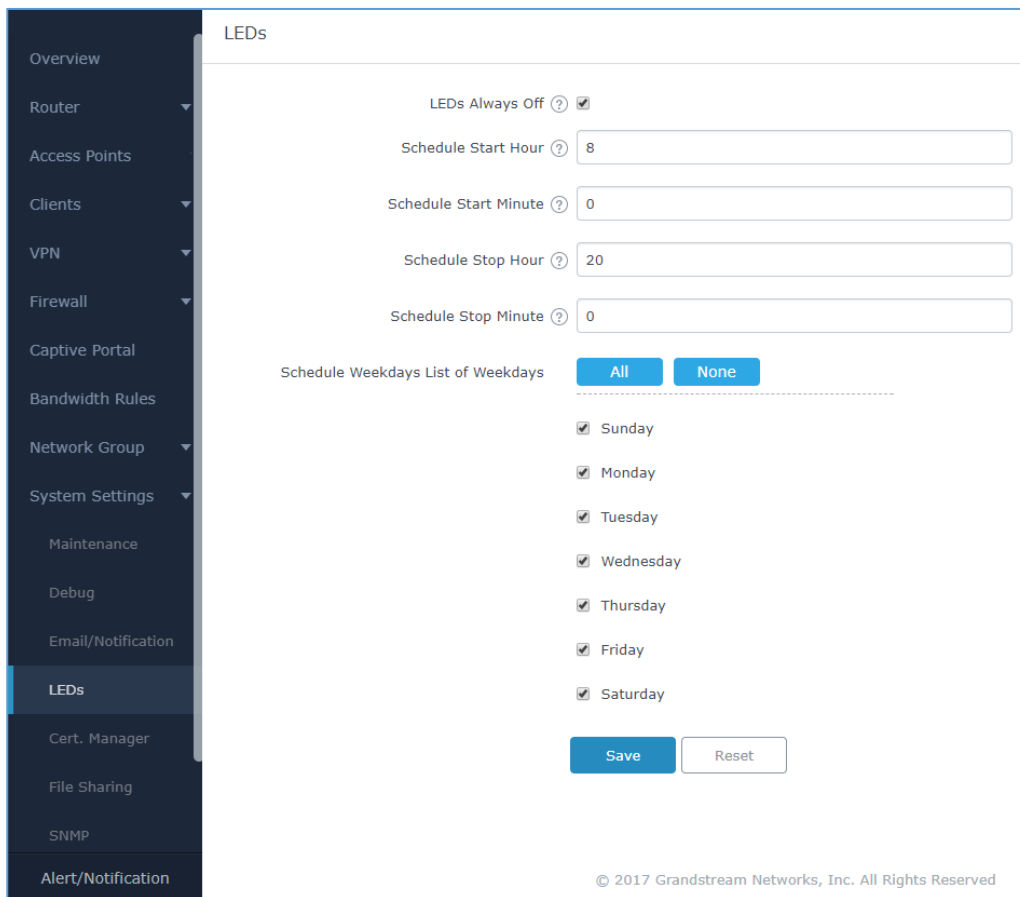


Figure 68: LED Schedule

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.



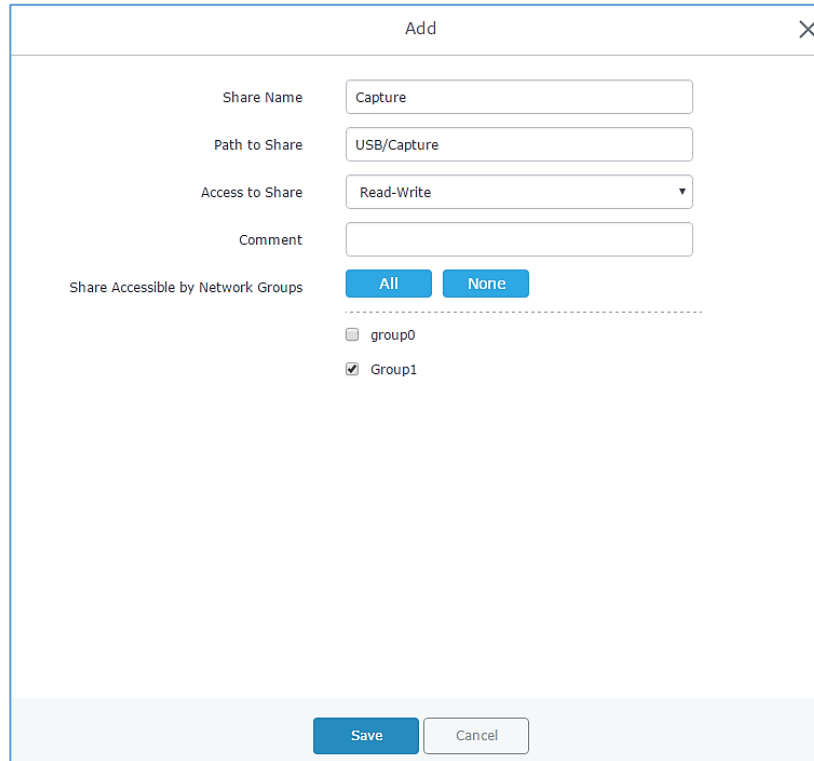




Figure 69: Add a New File to Share

Table 44: 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 



Share Name	Path to Share	Access to Share	Comment	Actions
Captures	PARTITION A/captures/	Read/Write		 

Figure 70: 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.



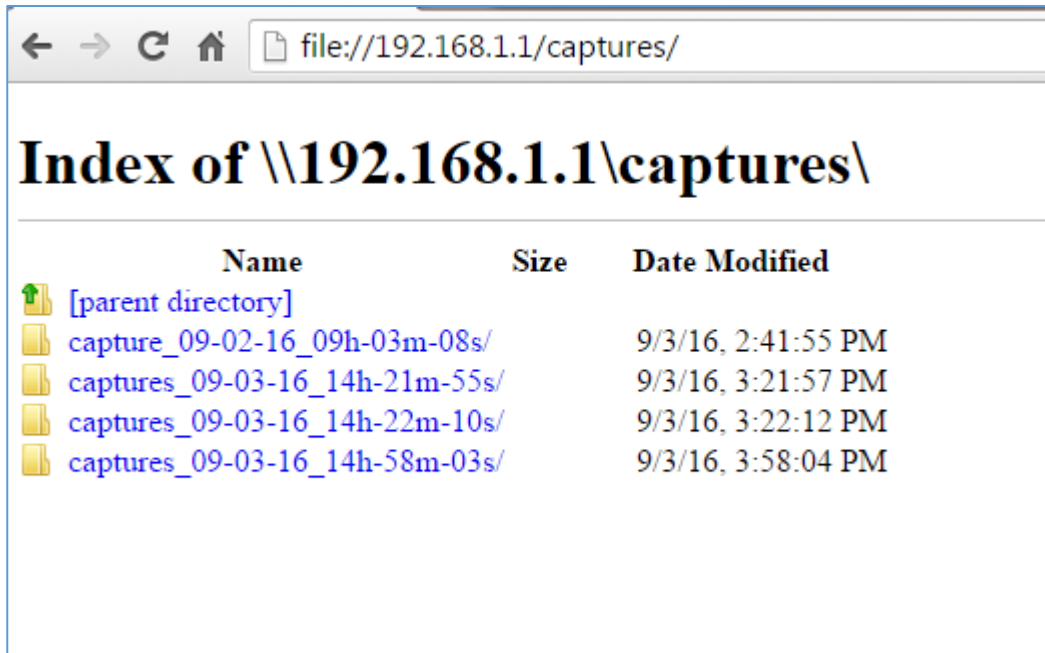


Figure 71: Access File Share

SNMP

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 45: SNMP Basic Page

System Location	Set the System Location information, for example: <i>SNMP-Server Lobby GWN.</i>
System Contact	Set the System Contact information, for example: Contact <i>Supervisor_GWN via extension is 1000.</i>
System Name	Set the System Name information, for example: <i>Supervisor_GWN.</i>
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 46: SNMP Advanced Page

SNMP Service Listening on	<p>Click on  to add an SNMP Service Listening on:</p> <ul style="list-style-type: none"> • 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	<p>Click on  to add an SNMPv3 User:</p> <ul style="list-style-type: none"> • 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.

User Manager

Under this section, administrator can generate or create user accounts that will be used for VPN connection authentication, click on  in order to create a new user account.

The following table summarizes the configuration parameters:



Table 47: VPN User Parameters

Option	Description
Enabled	Check this option to enable/disable the user account.
PPTP Server	Check this option to enable the user connection to the PPTP server.
Full Name	Enter user full name. When using PPTP it defaults to pptpd.
Username	Enter user Username.
Password	Enter user password.
IPSec Pre-Shared Key	Set user pre-shared key for authentication.
Enabled PPTP Client Subnet	Check this option when using PPTP, and enter the client subnet.
Client Subnet	Configured to which subnet this client belongs to (ex: 192.168.1.0/24).
OpenVPN Subnet	Configures OpenVPN user subnet (ex: 192.168.1.0/24).



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 48: Network Upgrade Configuration

Upgrade Via	Choose the firmware upgrade method: TFTP, HTTP or HTTPS.
Firmware Server	Define the server path for the firmware server.
Check/Download New Firmware and Config at Boot	Allows the device to check if there is a firmware from the configured firmware server at boot.
Allow DHCP options 66 and 43 override	Configure whether to allow DHCP options 66 and 43 to override upgrade and provisioning settings.
Automatic Upgrade	Specify the time to check for firmware upgrade (in minutes).
Upgrade Now	Click on  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  button.

 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

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