Vigor2928 Series

Dual-WAN Security Router

User's Guide

Version: 1.0

Firmware Version: V5.4.0

Date: 11 March 2026

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Safety Instructions and Approval

Safety Instructions

- Read the installation guide thoroughly before you set up the router.
- The router is a complicated electronic unit that may be repaired only be authorized and qualified personnel. Do not try to open or repair the router yourself.
- Do not place the router in a damp or humid place, e.g. a bathroom.
- The router should be used in a sheltered area, within a temperature range of 0 to +40 Celsius.
- Do not expose the router to direct sunlight or other heat sources. The housing and electronic components may be damaged by direct sunlight or heat sources.
- Do not deploy the cable for LAN connection outdoor to prevent electronic shock hazards.
- Do not power off the device when saving configurations or firmware upgrades. It may damage the data in a flash. Please disconnect the Internet connection on the router before powering it off when a TR-069/ ACS server manages the router.
- Keep the package out of reach of children.
- When you want to dispose of the router, please follow local regulations on conservation of the environment.

Warranty

We warrant to the original end user (purchaser) that the router will be free from any defects in workmanship or materials for a period of two (2) years from the date of purchase from the dealer. Please keep your purchase receipt in a safe place as it serves as proof of date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, we will, at our discretion, repair or replace the defective products or components, without charge for either parts or labor, to whatever extent we deem necessary tore-store the product to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be offered solely at our discretion. This warranty will not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions. The warranty does not cover the bundled or licensed software of other vendors. Defects which do not significantly affect the usability of the product will not be covered by the warranty. We reserve the right to revise the manual and online documentation and to make changes from time to time in the contents hereof without obligation to notify any person of such revision or changes.

Be a Registered Owner

Web registration is preferred. You can register your Vigor router via https://myvigor.draytek.com.

Firmware & Tools Updates

Due to the continuous evolution of DrayTek technology, all modems will be regularly upgraded. Please consult the DrayTek web site for more information on newest firmware, tools and documents.
https://www.draytek.com

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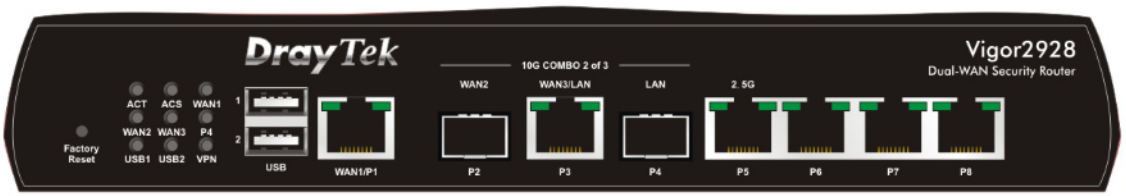
I-1 Introduction

This is a generic International version of the user guide. Specification, compatibility and features vary by region. For specific user guides suitable for your region or product, please contact local distributor.

I-1-1 LED Indicators and Connectors for Vigor2928

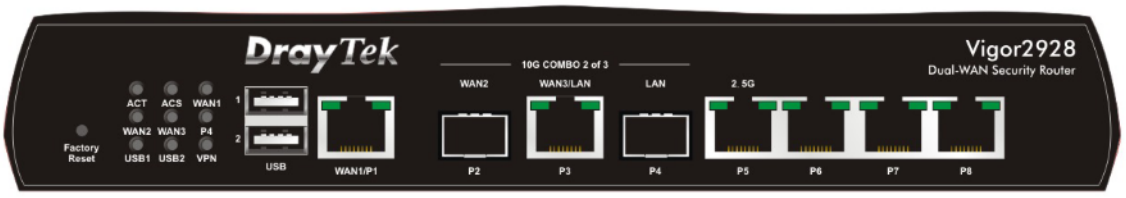
Before you use the Vigor modem, please get acquainted with the LED indicators and connectors first.

LED



LED	Status	Explanation
ACT	Off	The router is powered off.
	Blinking	The router is powered on and running normally.
ACS	On	The router has registered and connected to VigorACS server.
	Off	The router has not connected to VigorACS server.
WAN1~3	On	The interface is enabled on Configuration>>WAN Connections.
	Off	Internet connection is not ready.
	Blinking	The data is transmitting.
USB1~2	On	The interface is enabled on Configuration>>WAN Connections.
	Off	No USB device is connected.
	Blinking	The data is transmitting.
P4	On	The LAN port is connected.
	Off	The LAN port is disconnected.
	Blinking	The data is transmitting.
VPN	On	The VPN tunnel is active.
	Off	VPN services are disabled
	Blinking	Traffic is passing through VPN tunnel.
WAN1/P1		
Left LED	On	The port is connected.
	Off	The port is disconnected.

	Blinking	The data is transmitting.
Right LED	On	The port is connected with 1000 Mbps.
	Off	The port is connected with 10/100 Mbps.
WAN3/LAN/P3		
Left LED	On	The port is connected.
	Off	The port is disconnected.
	Blinking	The data is transmitting.
Right LED	On	The port is connected with 2.5/5/10 Gbps.
	Off	The port is connected with 100/1000 Mbps.
LAN P5		
Left LED	On	The port is connected.
	Off	The port is disconnected.
	Blinking	The data is transmitting.
Right LED	On	The port is connected with 2.5 Gbps.
	Off	The port is connected with 100/1000 Mbps
LAN P6-P8		
Left LED	On	The port is connected.
	Off	The port is disconnected.
	Blinking	The data is transmitting.
Right LED	On	The port is connected with 1000 Mbps.
	Off	The port is connected with 10/100 Mbps



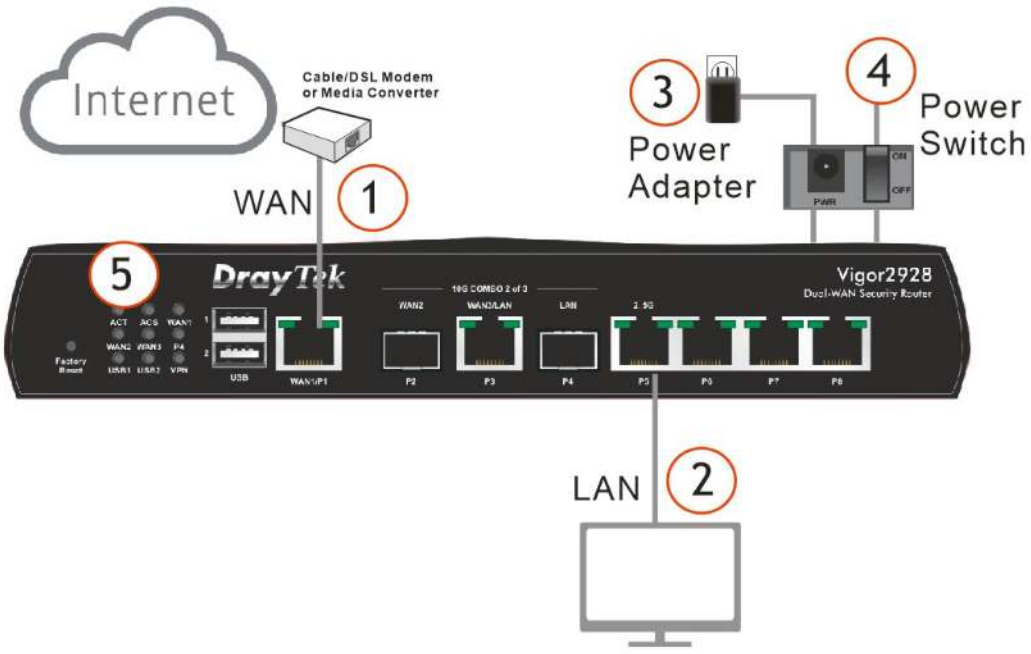
Interface	Explanation
Factory Reset	Restore the default settings. Usage: Turn on the router (ACT LED is blinking). Press the hole and keep for more than 5 seconds. When you see the ACT LED begins to blink rapidly than usual, release the button. Then the router will restart with the factory default configuration.
USB1~2	Connecter for a USB device (for 3G/4G USB Modem or printer).
WAN1 / P1	Connecter for the modem for accessing the Internet.
10G COMBO 2 of 3	Select any two ports to be the WAN port (either SPF+ or Ethernet) and the LAN port. In this configuration, P2(SPF+) is designated as the WAN port, and P4(SPF+) is designated as the LAN port. Only P3 is a switchable Ethernet port, which can be used for either WAN or LAN connections. For example, Selecting P2/P3: P2 is WAN2 port; P3 is LAN port. Selecting P3/P4: P3 is WAN3 port; P4 is LAN port. WAN# - Connecter for a modem for accessing the Internet. LAN - Connecter for the local network device.
LAN P5~P8	Connecters for the local network devices. In which, only P5 is available for 2.5G connection.
PWR	Connecter for a power adapter.
ON/OFF	Power Switch.

I-2 Hardware Installation

This section will guide you to install the Vigor2928 through a hardware connection and configure the device's settings through the web browser.

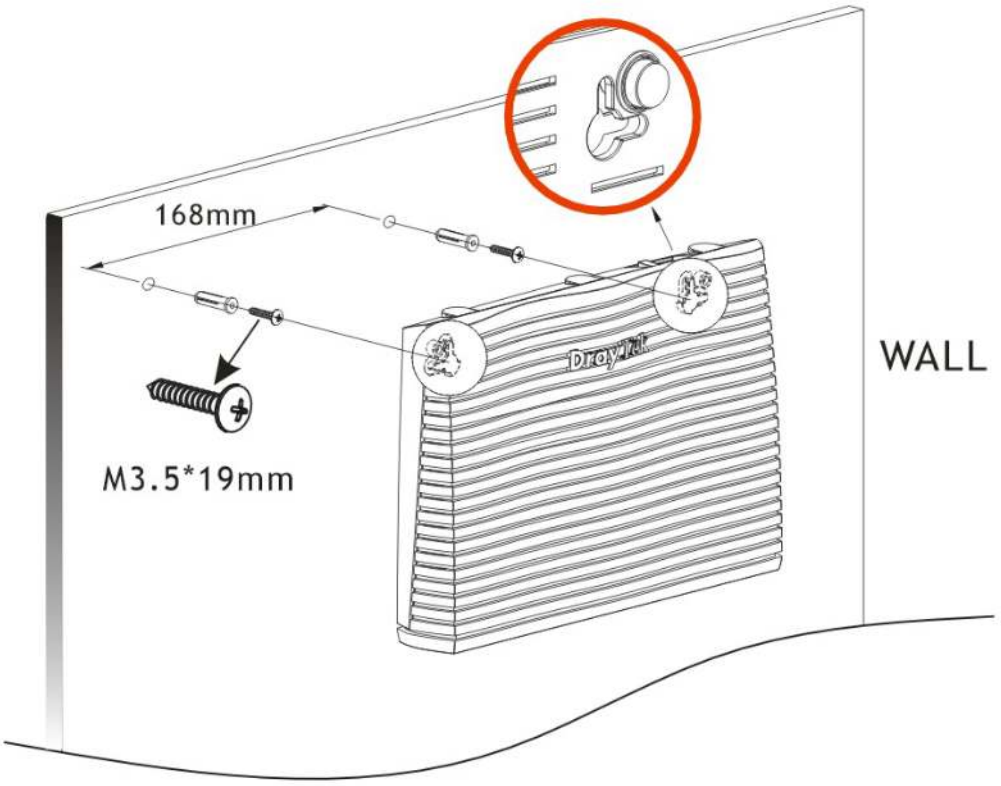
I-2-1 Network Connection

1. Connect the cable Modem/DSL Modem/Media Converter to any WAN port of router with Ethernet cable (RJ-45).
2. Connect one end of an Ethernet cable (RJ-45) to one of the LAN ports of the router and the other end of the cable (RJ-45) into the Ethernet port on your computer.
3. Connect one end of the power adapter to the router's power port on the rear panel, and the other side into a wall outlet.
4. Power on the device by pressing down the power switch on the rear panel.
5. The system starts to initiate. After completing the system test, the ACT LED will light up and start blinking.



I-2-2 Wall-Mounted Installation

1. Drill the holes on the wall according to the recommended instruction.
2. Fit screws into the wall using the appropriate type of wall plug.
3. With the screws installed, the router can be slotted into place.



Note

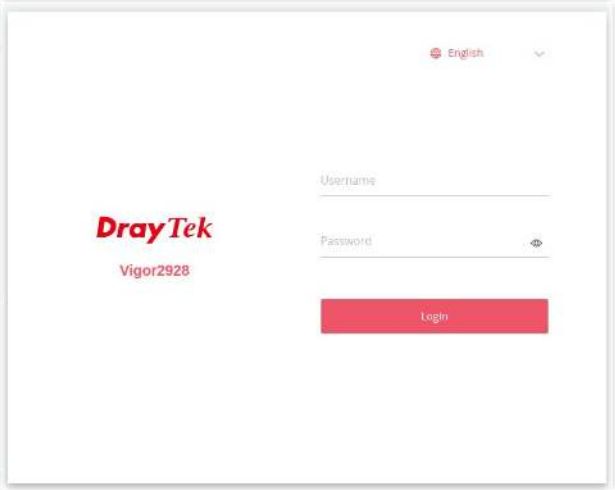
The recommended drill diameter shall be 6.5mm (1/4").

4. When you finished the above procedure, the modem has been mounted on the wall firmly.

I-3 Accessing to Web User Interface

All functions and settings of this access point must be configured via the web user interface. Please start your web browser (e.g., Firefox).

1. Make sure your PC connects to the Vigor router correctly.
2. Open a web browser on your PC and type http://192.168.1.1. A pop-up window will open to ask for a username and password. Pease type "admin/admin" on Username/Password and click Login.



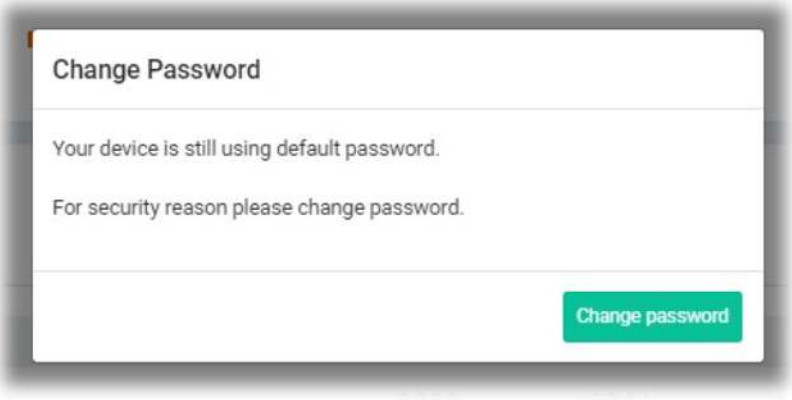
Note:

You may either simply set up your computer to get IP dynamically from the router or set up the IP address of the computer to be the same subnet as the default IP address of Vigor router 192.168.1.1.

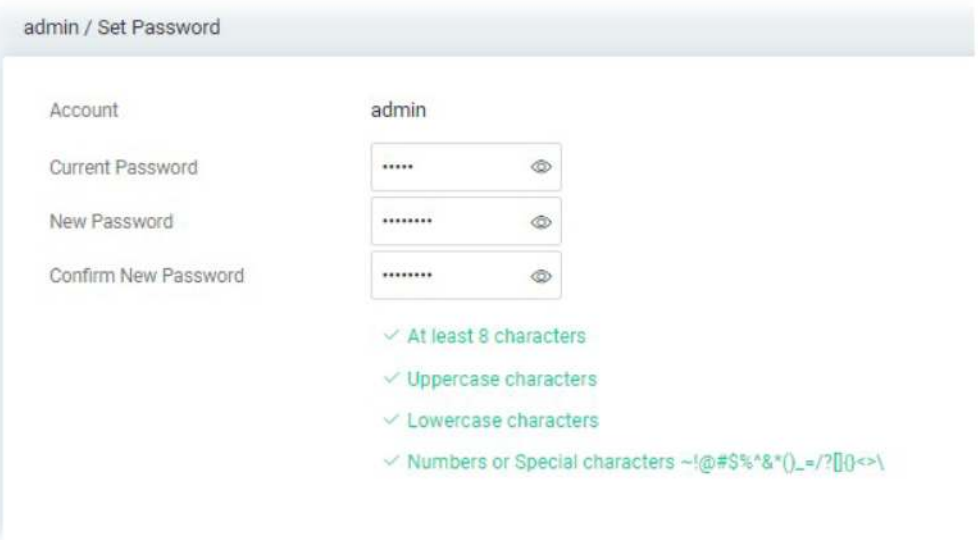
If you fail to access the web configuration, please go to "Trouble Shooting" for detecting and solving your problem.

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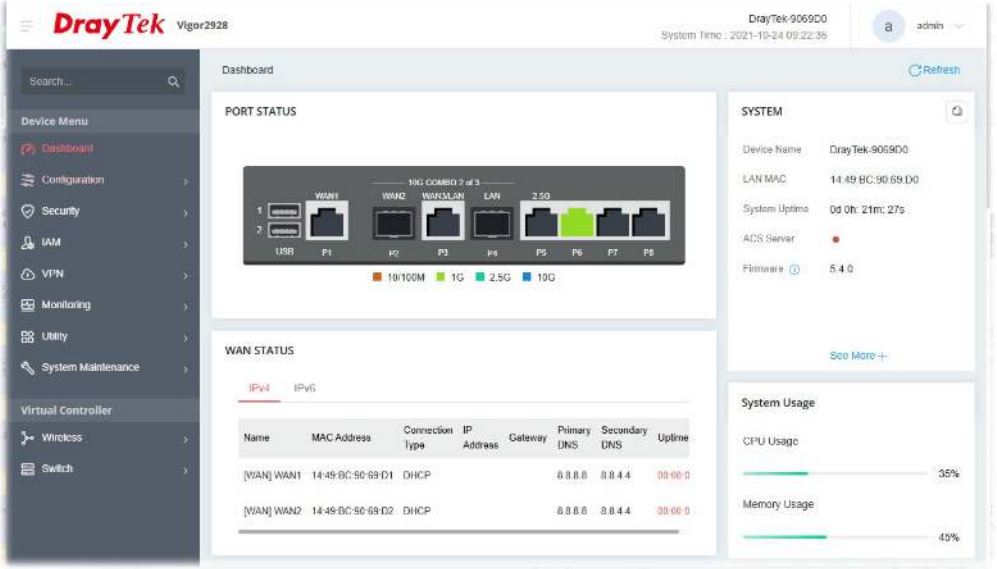
3. Next, the page will appear to guide you change the login password.



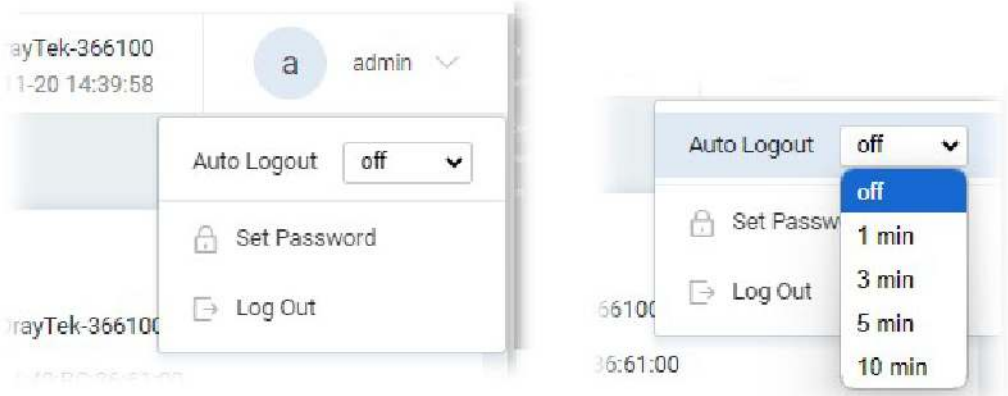
4. You MUST change the login password before accessing the web user interface. Please set a new password for network security.



5. After clicking **Apply**, the Main Screen will pop up.



6. The web page can be logged out by clicking **Log Out** on the top right of the web page. Or, logout the web user interface according to the chosen condition. The default setting is **Auto Logout**, which means the web configuration system will log out after 5 minutes without any operation. Change the setting of auto-logout if you want.



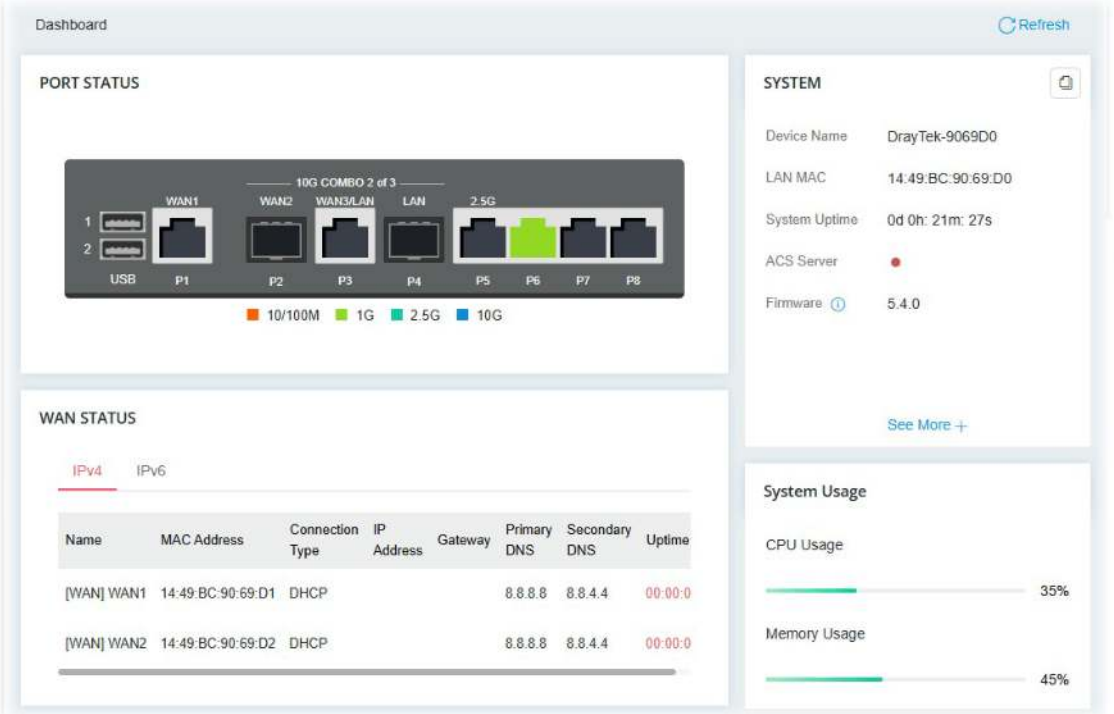
Note:

For using the device properly, it is necessary for you to change the password of web configuration for security and adjust primary basic settings.

I-4 Dashboard

Dashboard shows port status, LAN status, system status, LAN/WAN Usage and DSL information.

Click **Dashboard** from the main menu on the left side of the main page.



Note:

Switch these two icons by clicking on them.

 - means “Enable”.

 - means “Disable”.

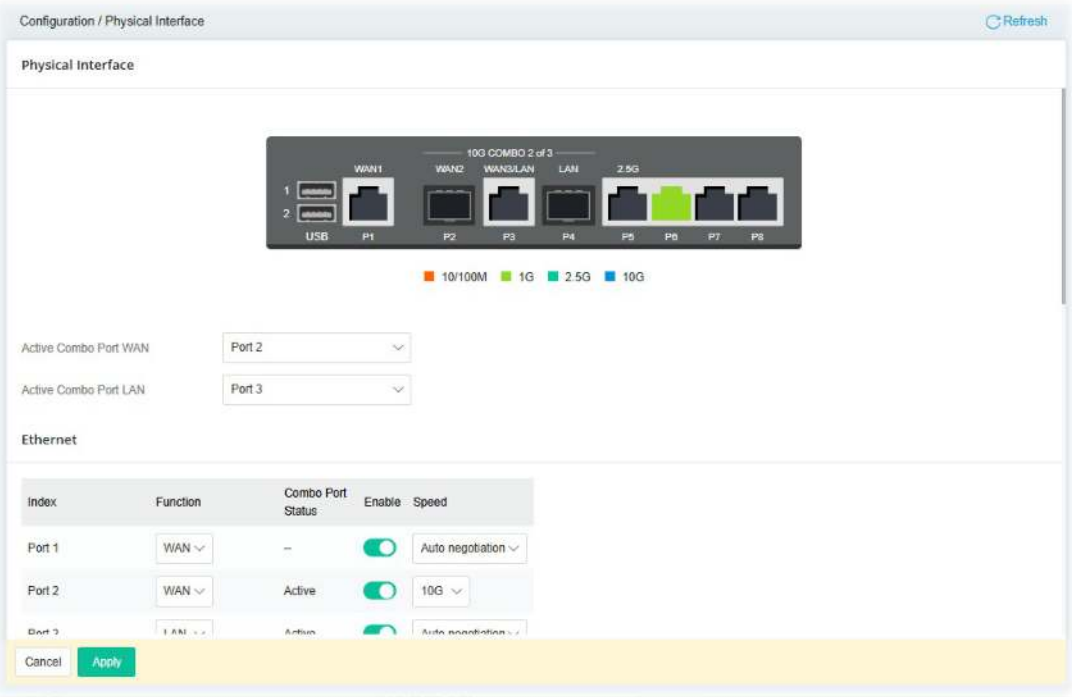
Chapter II Connectivity



II-1 Configuration

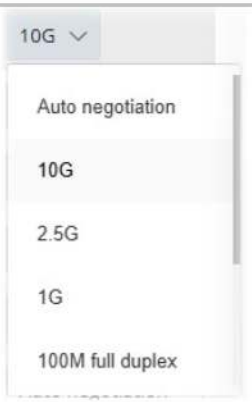
II-1-1 Physical Interface

Configure the general settings for available interfaces. Open Configuration >> Physical Interface.



Available settings are explained as follows:

Item	Description
Active Combo Port WAN & Active Combo Port LAN	Select any two ports to be the WAN port (either SPF+ or Ethernet) and the LAN port. In this configuration, Port 2(SPF+) is designated as the WAN port, and Port 4(SPF+) is designated as the LAN port. Only Port 3 is a switchable Ethernet port, which can be used for either WAN or LAN connections.
Ethernet	
Index	Displays the available interfaces of this device.
Function	Displays the type (WAN or LAN) of the interface.
Enable	Switch the toggle to enable or disable the interface.
Speed	Set the port speed capabilities for each interface.



For Port 2 and 4



For Port 5



For Port 1, 6 to 8

Port speed capabilities:

Auto negotiation - Auto speed with all capabilities.

10G - Force speed with 10G ability.

2.5G - Force speed with 2.5G ability.

1G - Force speed with 1G ability.

10M half duplex - Force speed with 10M ability.

10M full duplex - Force speed with 10M ability.

100M half duplex - Force speed with 100M ability.

100M full duplex - Force speed with 100M ability.

Selecting Auto (auto-negotiation) allows one port to negotiate with a peer port automatically to obtain the connection speed and duplex mode that both ends support. When auto-negotiation

	is turned on, a port on the switch negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer port does not support auto-negotiation or turns off this feature, the switch determines the connection speed by detecting the signal on the cable and using half duplex mode. When the switch's auto-negotiation is turned off, a port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer port are the same in order to connect.
USB	
Interface	Displays the available USB interface of this device.
Enable	Switch the toggle to enable or disable the interface.
LED	
Interface	Indicate all LEDs on the front panel.
LED Sleep Schedule	The LED can be turned on or off based on the settings configured in the selected schedule (defined under Configuration>>Objects) profile to fulfill specific requirements. When LED is slept, it can be woken up by pressing one of the following buttons: • Factory Reset on the front panel • Wake up LED on this configuration page Note that if the schedule is set with repeat type and applied here, the LED on the device will be turned on and turned off at specified time periodically and automatically.
Enable	In default, the LED on the device will be always on. However, the LED can be turned on or off after a specified number of minutes has elapsed to meet certain requirements. For this, switch the toggle to enable this setting.
Button	
Interface	Displays the available buttons (Reset) of this device.
Enable	Switch the toggle to enable or disable the function of the buttons.

Note:

Switch these two icons by clicking on them.

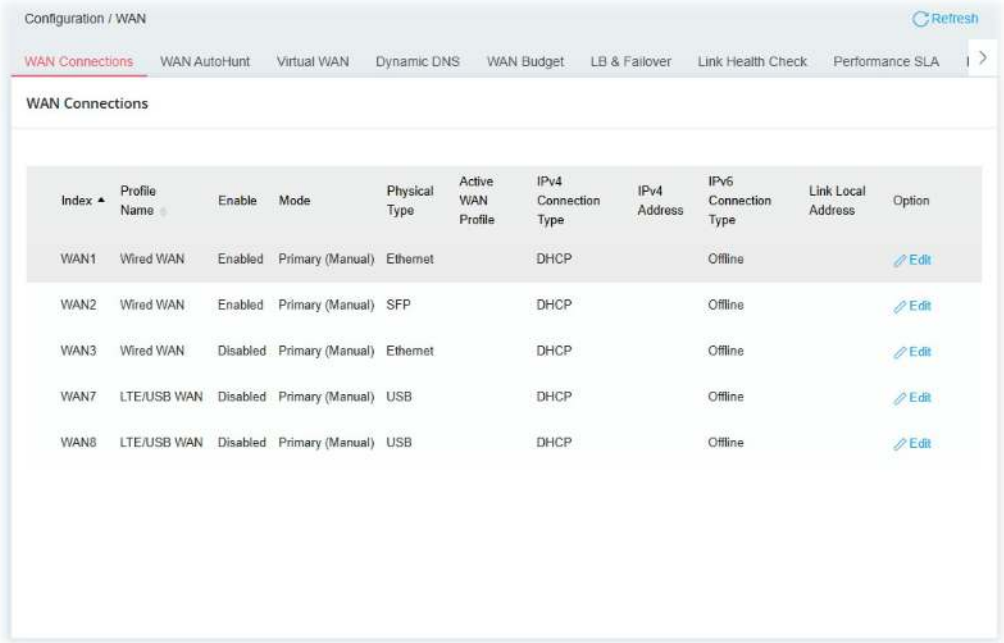
 - means "Enable".

 - means "Disable".

II-1-2 WAN

II-1-2-1 WAN Connections

This page is to configure the general settings for WAN connection.



Available settings are explained as follows:

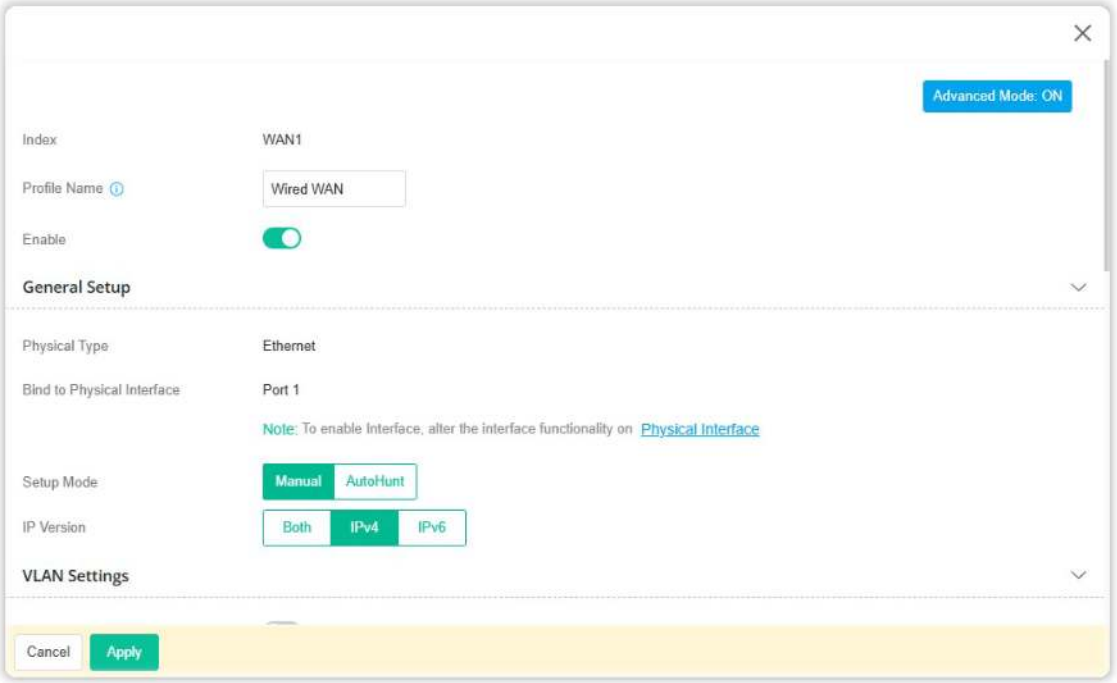
Item	Description
Profile Name	Displays the name of the interface.
Enable	Displays if the WAN interface is enabled or disabled.
Mode	Displays if the WAN interface is primary or failover interface.
Physical Type	Displays the physical type (e.g., Ethernet, SFP or USB) of the WAN interface.
IPv4 Connection Type	Displays the IPv4 connection type (e.g, Static IP, DHCP and etc.) used by the WAN interface.
IPv4 Address	Displays the IP address assigned by the DHCP server or the static IP address specified manually.
IPv6 Connection Type	Displays the IPv6 connection type used by the WAN interface.
Link Local Address	Displays the IPv6 address for the IPv6 connection type – Static.
Option	Edit - Click to modify the interface name and physical mode.

To configure the detailed settings (varied by physical type) for the selected WAN interface, click the Edit link to the right side of the WAN interface.

For Physical Type with Ethernet

For static IP access mode, you usually receive a fixed public IP address or a public subnet, namely multiple public IP addresses from your Cable ISP service providers. In most cases, a Cable service provider will offer a fixed public IP. If you have a public subnet, you could assign an IP address or many IP address to the WAN interface.

Click the **Edit** link for WAN1/WAN3 to open the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode:ON/OFF	Click to show or hide the advanced settings (IP Alias and WAN MAC Address) for the WAN interface.
Index	Displays current WAN interface.
Profile Name	Displays the name of the profile.
Enable	Switch the toggle to enable or disable the function.
	General Setup
Physical Type	Displays the physical type used by this interface.
Bind to Physical Interface	Displays the port number.
Setup Mode	Determine the WAN connection established on the settings page or automatically based on the AutoHunt profiles, processed one by one. Manual – If selected, the WAN connection will be performed according to the settings configured in this page. AutoHunt – The Vigor router will automatically connect to Ethernet WAN connection. Once connected and powered on, the router will run through a list of network connection settings (based on the autohunt profiles) to determine if it can establish a connection. If it

	is unable to connect, the mechanism will proceed to the next ISP setting until it receives an IP address. If Auto Hunt is selected, configure the following: • AutoHunt Profile – Select the AutoHunt profile(s). • +Add – Click to specify the autohunt profile(s).
IP Version	Set the protocol (IPv4 or IPv6 or both) that this WAN interface used.
VLAN Settings	
Customer VLAN	Switch the toggle to enable or disable 802.1Q VLAN tagging for the WAN connection. When enabled, the WAN traffic will be tagged with the specified VLAN ID, which is often required by the ISP for internet connectivity. Tag - Enter the VLAN ID number required by your ISP. The range is from 1 to 4094. Priority - Enter the 802.1p packet priority number. The range is from 0 to 7.
Service VLAN	Switch the toggle to enable or disable Service VLAN (QinQ) tagging. When enabled, the device adds an outer VLAN tag (S-TAG) on top of the Customer VLAN tag, encapsulating traffic for ISP or upstream carrier network transport. Tag - Enter the Service VLAN ID number. The range is from 1 to 4094 Priority - Enter the packet priority number for the Service VLAN. The range is from 0 to 7.
IPv4	
IPv4 Connection Type	It is available when Both or IPv4 is selected as IP Version. PPPoE – Set the access mode as PPPoE. • Username – Username provided by the ISP for PPPoE authentication. • Password – Password provided by the ISP for PPPoE authentication. • Service Name – PPP service name tag. Required by some ISPs. Leave blank unless instructed otherwise by your ISP. This feature is available only when Advanced Mode is activated. • PPP Authentication – The protocol used for PPP authentication. PAP or CHAP- Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use. This feature is available only when Advanced Mode is activated. • IP Assignment –This feature is available only when Advanced Mode is activated. It is available when PPPoE is selected as IPv4 Connection Type. DHCP - WAN IP address is dynamically allocated. Static IP - ISP has assigned a fixed WAN IP address. Enter an IP address. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. DHCP – The router receives IP configuration information from a

	DHCP server. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. Static IP – Set the access mode as Static IP. • IP Address – WAN IP address assigned by the ISP. • Subnet Mask – WAN subnet mask. • Gateway IP – IP address of the WAN Gateway. • IPv4 Primary DNS –IP address of primary DNS server. • IPv4 Secondary DNS - IP address of secondary DNS server. Outbound DNS Query IP - This feature is available only when Advanced Mode is activated. Specify the source IP address which will be used by the router to send out the DNS query. • Default IP – The query IP is set by Vigor router automatically. • Alias IP – Enter a user-defined IP for DNS query.
WAN Connection Detection	
Mode	Configures how the WAN connection is monitored. Available modes depend on the IPv4 Connection Type selected. Always On - The router assumes the WAN connection is always active. ARP Detect - The router broadcasts an ARP request every 5 seconds. If no response is received within 30 seconds, the WAN connection is deemed to have failed. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request based on the ping interval setting to the host, whose address is specified in the Ping Gateway IP field, to verify the WAN connection. If the remote host does not respond within certain seconds (defined in the ping interval), the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Ping Gateway IP - Switch the toggle to enable/ use the current WAN gateway IP address for pinging. With the IP address(es) pinging, Vigor router can check if the WAN connection is on or off. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
IP Alias	IPv4 Alias - If you have multiple public IP addresses and would like to utilize them on the WAN interface, please use WAN IP Alias. You can set up to 8 public IP addresses other than the current one you are using. +Add – Click to add an IPv4 address as the IPv4 alias.
IPv6	

IPv6 Connection Type	It is available when Both or IPv6 is selected as IP Version. Offline – When Offline is selected, the IPv6 connection will be disabled. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv6 Primary DNS –IP address of primary DNS server. IPv6 Secondary DNS - IP address of secondary DNS server. PPP – IPv6 WAN address is assigned along with the IPv4 WAN address during PPPoE negotiation. This IPv6 access mode requires that the IPv4 uses PPPoE. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv6 Primary DNS – IP address of primary DNS server. IPv6 Secondary DNS - IP address of secondary DNS server. Static – Configure an ISP-assigned static IPv6 setup. • +Add – Click it to add the values in the IPv6 Address and Prefix Length fields to the Global Address Table. • IPv6 Global Address – WAN IPv6 address assigned by the ISP. • Prefix Length – Length of the IPv6 prefix. • Gateway Address - IPv6 address of the ISP gateway. • IPv6 Primary / Secondary DNS – IPv6 address of primary / secondary DNS server. DHCPv6 – Use DHCPv6 protocol to obtain IPv6 address from server. • DUID – Displays the DHCP unique ID used by this WAN interface. • IAID – Unique integer that identifies this WAN interface. • Authentication Protocol - This protocol will be used for the client to be authenticated by DHCPv6 server before accessing into Internet. There are three types can be specified, Reconfigure Key, Delayed and None. - None - In general, the default setting is None. - Reconfigure Key – During the connection process, DHCPv6 server will authenticate the client automatically. - Delayed - During the connection process, DHCPv6 server will authenticate and identify the client based on the key ID, realm and secret information specified in these fields. Key ID – Type a value (range from 1 to 65535) which will be used to generate HMAC-MD5 value. Realm – The name (1 to 31 characters) typed here will identify the key which generates HMAC-MD5 value. Secret – Type a text (1 to 31 characters) as s a unique identifier for each client on each DHCP server. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv6 Primary DNS – IP address of primary DNS server. IPv6 Secondary DNS - IP address of secondary DNS server. TSPC - Tunnel setup protocol client (TSPC) is an application which

could help you to connect to IPv6 network easily.

Please make sure your IPv4 WAN connection is OK and apply one free account from hexago (http://gogonet.gogo6.com/page/freenet6-account) before you try to use TSPC for network connection. TSPC would connect to tunnel broker and requests a tunnel according to the specifications inside the configuration file. It gets a public IPv6 IP address and an IPv6 prefix from the tunnel broker and then monitors the state of the tunnel in background.

After getting the IPv6 prefix and starting router advertisement daemon (RADVD), the PC behind this router can directly connect to IPv6 the Internet.

- Tunnel Broker Address – Enter the address for the tunnel broker IP, FQDN or an optional port number.
- Username – It is suggested for you to apply another username and password for http://gogonet.gogo6.com/page/freenet6-account.
- Password - Enter the password assigned with the user name.
- WAN DNS – Select Auto or Manual.

  If Manual is selected, specify the primary and secondary DNS servers.

  IPv6 Primary DNS – IP address of primary DNS server.

  IPv6 Secondary DNS - IP address of secondary DNS server.

6in4 – Setup 6in4 Static Tunnel for WAN interface.

However, 6in4 offers a prefix outside of 2002::0/16. So, you can use a fixed endpoint rather than any cast endpoint. The mode has more reliability.

- Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6in4 connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through.
- Remote Endpoint IPv4 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Prefix Length – WAN IPv6 prefix length assigned by the tunnel provider.
- LAN Routed Prefix – LAN IPv6 address prefix.
- LAN Routed Prefix Length – LAN IPv6 address prefix length.
- Tunnel TTL – Time to live value, which is the maximum number of hops allowed to the endpoint.
- WAN DNS – Select Auto or Manual.

  If Manual is selected, specify the primary and secondary DNS servers.

  IPv6 Primary DNS – IP address of primary DNS server.

  IPv6 Secondary DNS - IP address of secondary DNS server.

6rd - Setup 6rd for WAN interface.

- Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6rd connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through.
- Mode – Two options, Auto and Static. Auto - Used in

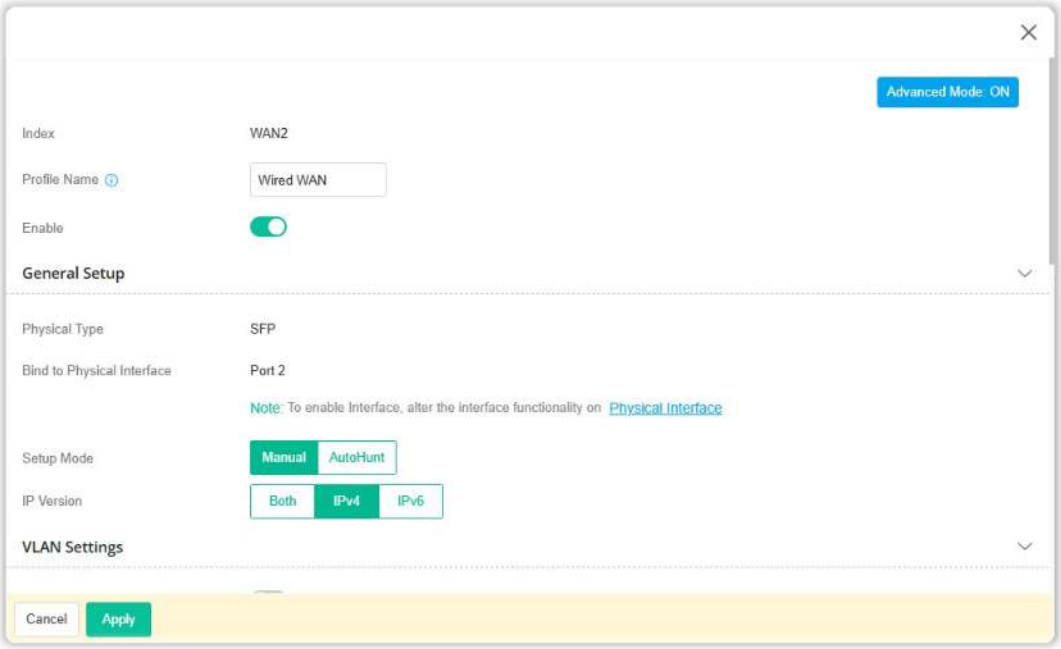
	conjunction with DHCPv4, the router automatically provisions IPv6 using option 212. **Static** - IPv6 configuration information is manually entered. • **IPv4 Border Relay** – Enter the IPv4 addresses of the 6rd Border Relay for a given 6rd domain. • **6rd Prefix** – Enter the 6rd IPv6 address. • **6rd Prefix Length** - Enter the IPv6 prefix length for the 6rd IPv6 prefix in number of bits. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv6 Primary DNS – IP address of primary DNS server. IPv6 Secondary DNS - IP address of secondary DNS server.
IPv6 WAN Connection Detection	
Mode	Configures how the WAN connection is monitored. **Always On** - The router assumes the WAN connection is always active. **NS Detect** - The router verifies connectivity by issuing Neighbor Solicitation packets. **Ping Detect** - The router sends an ICMP (Internet Control Message Protocol) echo request based on the ping interval setting to the host, whose address is specified in the Ping IP field, to verify the WAN connection. If the remote host does not respond within certain seconds (defined in the ping interval), the WAN connection is deemed to have failed. If you choose **Ping Detect** as the detection mode, you have to enter required settings for the following items. • **Primary Ping IP** – Enter an IPv6 address in this field for pinging. • **Secondary Ping IP** - Enter an IPv6 address in this field for pinging. • **TTL** –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • **Ping Interval (Sec, 10-3600)** – Enter the interval for the system to execute the PING operation. • **Ping Retry** - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
MTU	
MTU	Maximum Transmission Unit, the size of the largest packet, in bytes, that can be transmitted to the WAN. The maximum value is 1500. For PPPoE connections, there is always an 8-byte overhead, so the maximum valid MTU value for PPPoE is 1492.
WAN MAC Address	
Mode	This feature is available only when Advanced Mode is activated. **Default** – Use the default MAC address for the WAN port. **Customized** - Select this option if your ISP authenticates by MAC addresses. • **MAC** - Specify a MAC address for the WAN Ethernet port.
MAC	Displays the MAC address of this device.

Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

For Physical Type with SFP

Click the **Edit** link for WAN2 to open the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode:ON/OFF	Click to show or hide the advanced settings (WAN MAC Address) for the WAN interface.
Index	Displays current WAN interface.
Profile Name	Displays the name of the profile.
Enable	Switch the toggle to enable or disable the settings of the function.
	General Setup
Physical Type	Displays the physical type (SFP) used by this interface.
Bind to Physical Interface	Displays the port number.
Setup Mode	Determine the WAN connection established on the settings page or automatically based on the AutoHunt profiles, processed one by one. Manual – If selected, the WAN connection will be performed according to the settings configured in this page. AutoHunt – The Vigor router will automatically connect to Ethernet WAN connection. Once connected and powered on, the router will run through a list of network connection settings (based on the autohunt profiles) to determine if it can establish a connection. If it is unable to connect, the mechanism will proceed to the next ISP setting until it receives an IP address. If Auto Hunt is selected, configure the following: • AutoHunt Profile – Select the AutoHunt profile(s). • +Add – Click to specify the autohunt profile(s).

IP Version	Set the protocol (IPv4 or IPv6 or both) that this WAN interface used.
	VLAN Settings
Customer VLAN	Switch the toggle to enable or disable 802.1Q VLAN tagging for the WAN connection. When enabled, the WAN traffic will be tagged with the specified VLAN ID, which is often required by the ISP for internet connectivity. Tag - Enter the VLAN ID number required by your ISP. The range is from 1 to 4094. Priority - Enter the 802.1p packet priority number. The range is from 0 to 7.
Service VLAN	Switch the toggle to enable or disable Service VLAN (QinQ) tagging. When enabled, the device adds an outer VLAN tag (S-TAG) on top of the Customer VLAN tag, encapsulating traffic for ISP or upstream carrier network transport. Tag - Enter the Service VLAN ID number. The range is from 1 to 4094 Priority - Enter the packet priority number for the Service VLAN. The range is from 0 to 7.
	IPv4
IPv4 Connection Type	It is available when Both or IPv4 is selected as IP Version. PPPoE – Set the access mode as PPPoE. • Username – Username provided by the ISP for PPPoE authentication. • Password – Password provided by the ISP for PPPoE authentication. • Service Name – PPP service name tag. Required by some ISPs. Leave blank unless instructed otherwise by your ISP. This feature is available only when Advanced Mode is activated. • PPP Authentication – The protocol used for PPP authentication. PAP or CHAP- Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use. This feature is available only when Advanced Mode is activated. • IP Assignment –This feature is available only when Advanced Mode is activated. It is available when PPPoE is selected as IPv4 Connection Type. DHCP - WAN IP address is dynamically allocated. Static IP - ISP has assigned a fixed WAN IP address. Enter an IP address. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. DHCP – The router receives IP configuration information from a DHCP server. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv6 Primary DNS – IP address of primary DNS server.

	IPv6 Secondary DNS - IP address of secondary DNS server. Static IP – Set the access mode as Static IP. • IP Address – WAN IP address assigned by the ISP. • Subnet Mask – WAN subnet mask. • Gateway IP – IP address of the WAN Gateway. • IPv4 Primary DNS – IP address of primary DNS server. • IPv4 Secondary DNS - IP address of secondary DNS server.
	WAN Connection Detection
Mode	Configures how the WAN connection is monitored. Always On - The router assumes the WAN connection is always active. ARP Detect - The router broadcasts an ARP request every 5 seconds. If no response is received within 30 seconds, the WAN connection is deemed to have failed. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request based on the ping interval setting to the host, whose address is specified in the Ping Gateway IP field, to verify the WAN connection. If the remote host does not respond within certain seconds (defined in the ping interval), the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Ping Gateway IP - Switch the toggle to enable/ use the current WAN gateway IP address for pinging. With the IP address(es) pinging, Vigor router can check if the WAN connection is on or off. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
IP Alias	IPv4 Alias - If you have multiple public IP addresses and would like to utilize them on the WAN interface, please use WAN IP Alias. You can set up to 8 public IP addresses other than the current one you are using. +Add – Click to add an IPv4 address as the IPv4 alias.
	MTU
MTU	Maximum Transmission Unit, the size of the largest packet, in bytes, that can be transmitted to the WAN. The maximum value is 1500. For PPPoE connections, there is always an 8-byte overhead, so the maximum valid MTU value for PPPoE is 1492.
	WAN MAC Address
Mode	This feature is available only when Advanced Mode is activated. Default – Use the default MAC address for the wireless WAN. Customized - Select this option to use customized MAC addresses. • MAC - Specify a MAC address for the wireless WAN.

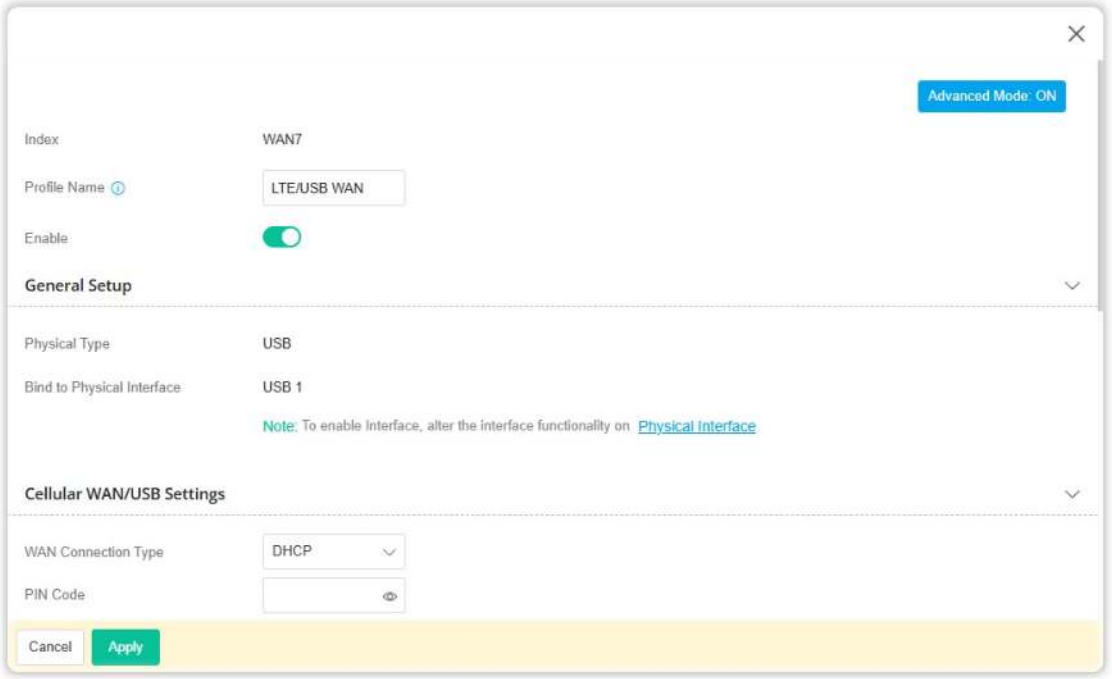
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

For Physical Type with USB

It is available for USB modem only. USB WAN uses the embedded module to access internet.

Click the **Edit** link for WAN7 or WAN8 to open the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode:ON/OFF	Click to show or hide the advanced settings (WAN MAC Address) for the WAN interface.
Profile Name	Displays current WAN interface.
Enable	Switch the toggle to enable or disable the access mode.
	General Setup
Physical Type	Displays the physical type used by this interface.
Bind to Physical Interface	Displays which USB port is used.
	Cellular WAN /USB Settings
USB Mode	DHCP – Dynamic Host Configuration Protocol is used to establish a connection. • PIN Code - PIN code of the SIM card in the modem. The maximum length of the PIN is 15 characters. • Enable Username/Password Authentication - Switch the toggle to enable or disable the function. Authentication – Select the protocol used for PPP authentication.

PAP only – Only PAP (Password Authentication Protocol) is used.
PAP or CHAP – Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use.
Username – Username provided by the ISP for authentication (optional).
Password - Password provided by the ISP for authentication (optional).

- Auto APN Name - Switch the toggle to enable / disable the function. If enabling this function, the Vigor system will use the APN Name based on the country code and the ISP.
  APN Name - Access Point Name to be used for the connection. Please contact your ISP or carrier for the appropriate value.
- Network Mode - Force Vigor router to connect Internet with the mode specified here. If you choose 5G/4G/3G as network mode, the router will choose a suitable one according to the actual wireless signal automatically.

PPP - Point-to-Point Protocol is used to establish a connection.

- PIN Code - PIN code of the SIM card in the modem. The maximum length of the PIN is 15 characters.
- Enable Username/Password Authentication - Switch the toggle to enable or disable the function.

  Authentication – Select the protocol used for PPP authentication.
  - PAP only – Only PAP (Password Authentication Protocol) is used.
  - PAP or CHAP – Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use.

  Username – Username provided by the ISP for authentication (optional).

  Password - Password provided by the ISP for authentication (optional).
- Generate Modem Initial String by – Select the method to generate the modem initial string.

  Following APN Name – Use the APN name as the modem initial string.

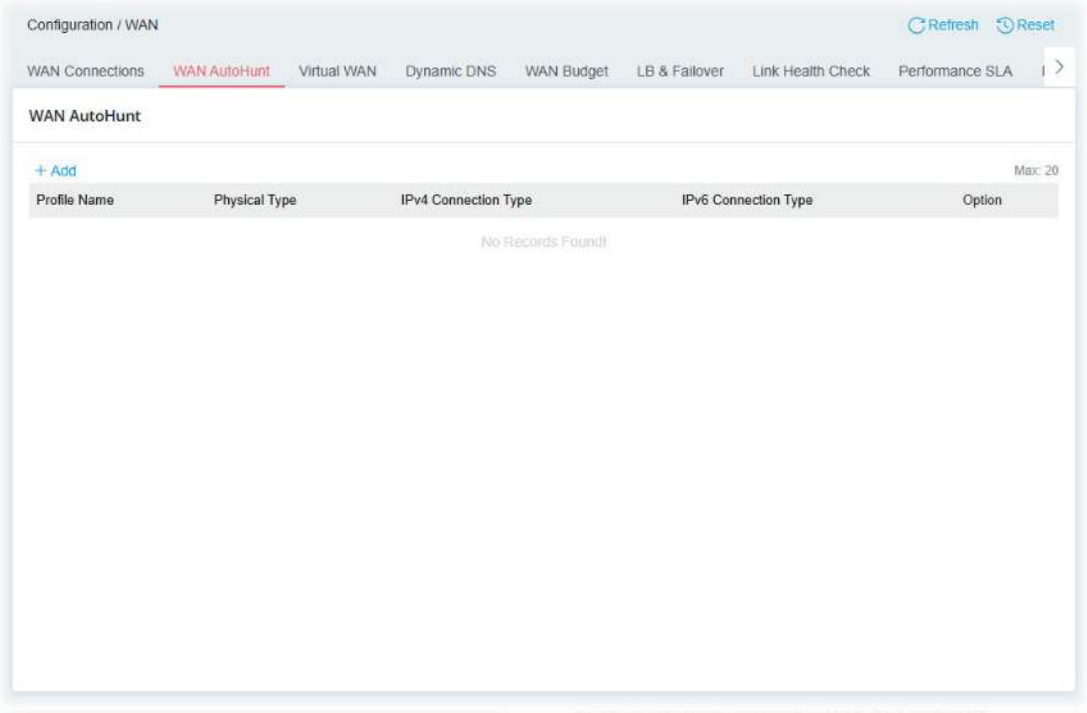
  Customized String – Set a string as the modem initial string.
  - Modem Initial String (Optional) – It is used to initialize USB modem. Please contact to your ISP.
- Auto APN Name - Switch the toggle to enable / disable the function. If enabling this function, the Vigor system will use the APN Name based on the country code and the ISP.
  APN Name - Access Point Name to be used for the connection. Please contact your ISP or carrier for the appropriate value.
- Modem Initial String2 (Optional) – The initial string 1 is shared with APN. In some cases, user may need another initial AT command to restrict 3G band or do any special settings.
- Modem Dial String (Optional) - It is used to dial through USB

	mode. Please use the default value. If you have any question, please contact to your ISP. • Service Name (Optional) – PPP service name tag. Required by some ISPs. Leave blank unless instructed otherwise by your ISP. This feature is available only when Advanced Mode is activated.
IPv4 - WAN Connection Detection	
WAN DNS	Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. • IPv4 Primary DNS –IP address of primary DNS server. • IPv4 Secondary DNS - IP address of secondary DNS server.
Mode	Configures how the WAN connection is monitored. PPP Detect – A method which detects if PPP connection between the router and the ISP is successful or not. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request based on the ping interval setting to the host, whose address is specified in the Ping Gateway IP field, to verify the WAN connection. If the remote host does not respond within certain seconds (defined in the ping interval), the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Ping Gateway IP - Switch the toggle to enable/ use the current WAN gateway IP address for pinging. With the IP address(es) pinging, Vigor router can check if the WAN connection is on or off. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
MTU	
MTU	Maximum Transmission Unit, the size of the largest packet, in bytes, that can be transmitted to the WAN. The maximum value is 1500. For PPPoE connections, there is always an 8-byte overhead, so the maximum valid MTU value for PPPoE is 1492.
WAN MAC Address	
Mode	This feature is available only when Advanced Mode is activated. Default – Use the default MAC address for the WAN port. Customized - Select this option if your ISP authenticates by MAC addresses. • MAC - Specify a MAC address for the WAN Ethernet port.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-2-2 WAN AutoHunt

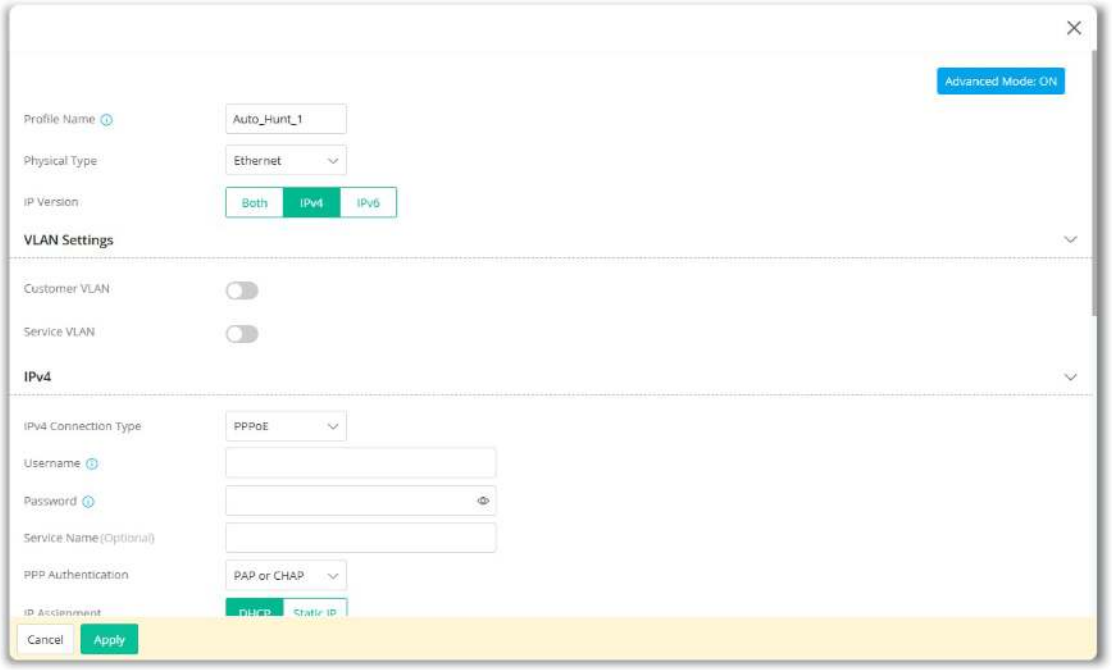
The Vigor router will automatically build the WAN connection. Once connected and powered on, the router will run through a list of network connection settings (based on the autohunt profiles) to determine if it can establish a connection. If it is unable to connect, the mechanism will proceed to the next ISP setting until it receives an IP address.



Item	Description
Reset	Click to clear all profiles to factory settings.
+Add	Click to bring up the configuration page of the virtual WAN profile (max. 20).

AutoHunt with Physical Type of Ethernet

To add a new autohunt profile, click the +Add link. Select Ethernet as the Physical Type. Refer to the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode:ON/OFF	Click to show or hide the advanced settings (IP Alias and WAN MAC Address) for the WAN interface.
Physical Type	Displays the physical type used by this interface.
IP Version	Set the protocol (IPv4 or IPv6 or both) that this WAN interface used.
	VLAN Settings
Customer VLAN	Switch the toggle to enable or disable 802.1Q VLAN tagging for the WAN connection. When enabled, the WAN traffic will be tagged with the specified VLAN ID, which is often required by the ISP for internet connectivity. Tag - Enter the VLAN ID number required by your ISP. The range is from 1 to 4094. Priority - Enter the 802.1p packet priority number. The range is from 0 to 7.
Service VLAN	Switch the toggle to enable or disable Service VLAN (QinQ) tagging. When enabled, the device adds an outer VLAN tag (S-TAG) on top of the Customer VLAN tag, encapsulating traffic for ISP or upstream carrier network transport. Tag - Enter the Service VLAN ID number. The range is from 1 to 4094 Priority - Enter the packet priority number for the Service VLAN. The range is from 0 to 7.
	IPv4
IPv4 Connection Type	It is available when Both or IPv4 is selected as IP Version. PPPoE – Set the access mode as PPPoE. • Username – Username provided by the ISP for PPPoE authentication. • Password – Password provided by the ISP for PPPoE authentication. • Service Name (Optional)– PPP service name tag. Required by

	some ISPs. Leave blank unless instructed otherwise by your ISP. • PPP Authentication – The protocol used for PPP authentication. PAP or CHAP - Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use. • IP Assignment – It is available when PPPoE is selected as IPv4 Connection Type. DHCP - WAN IP address is dynamically allocated. Static IP - ISP has assigned a fixed WAN IP address. Enter an IP address. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. DHCP – The router receives IP configuration information from a DHCP server. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. Static IP – Set the access mode as Static IP. • IP Address – WAN IP address assigned by the ISP. • Subnet Mask – WAN subnet mask. • Gateway IP – IP address of the WAN Gateway. • IPv4 Primary DNS –IP address of primary DNS server. • IPv4 Secondary DNS - IP address of secondary DNS server. Outbound DNS Query IP - This feature is available only when Advanced Mode is activated. Specify the source IP address which will be used by the router to send out the DNS query. • Default IP – The query IP is set by Vigor router automatically. • Alias IP – Enter a user-defined IP for DNS query.
WAN Connection Detection	
Mode	Configures how the WAN connection is monitored. The available modes will be varied according to the selected IPv4 Connection Type. Select PPP Detect or Ping Detect or Always On. PPP Detect – A method which detects if PPP connection between the router and the ISP is successful or not. Always On - The router assumes the WAN connection is always active. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request every second to the host, whose address is specified in the Ping IP field, to verify the WAN connection. If the remote host does not respond within 30 seconds, the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to

	enter required settings for the following items. • Ping Gateway IP - Switch the toggle to enable/ use the current WAN gateway IP address for pinging. With the IP address(es) pinging, Vigor router can check if the WAN connection is on or off. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
IP Alias	IPv4 Alias - If you have multiple public IP addresses and would like to utilize them on the WAN interface, please use WAN IP Alias. You can set up to 8 public IP addresses other than the current one you are using. +Add – Click to add an IPv4 address as the IPv4 alias.
	IPv6
IPv6 Connection Type	It is available when Both or IPv6 is selected as IP Version. Offline – When Offline is selected, the IPv6 connection will be disabled. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS – IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. PPP – IPv6 WAN address is assigned along with the IPv4 WAN address during PPPoE negotiation. This IPv6 access mode requires that the IPv4 uses PPPoE. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. Static – Configure an ISP-assigned static IPv6 setup. • +Add –Click it to add the values in the IPv6 Address and Prefix Length fields to the Global Address Table. IPv6 Global Address – WAN IPv6 address assigned by the ISP. Prefix Length – Length of the IPv6 prefix. • Gateway Address - IPv6 address of the ISP gateway. • IPv6 Primary DNS – IPv6 address of primary DNS server. • IPv6 Secondary DNS – IPv6 address of secondary DNS server. DHCPv6 – Use DHCPv6 protocol to obtain IPv6 address from server. • IAID – Unique integer that identifies this WAN interface. • Authentication Protocol - This protocol will be used for the client to be authenticated by DHCPv6 server before accessing into Internet. There are three types can be specified, Reconfigure Key, Delayed and None. None - In general, the default setting is None.

Reconfigure Key – During the connection process, DHCPv6 server will authenticate the client automatically.

Delayed - During the connection process, DHCPv6 server will authenticate and identify the client based on the key ID, realm and secret information specified in these fields.

- Key ID – Type a value (range from 1 to 65535) which will be used to generate HMAC-MD5 value.
- Realm – The name (1 to 31 characters) typed here will identify the key which generates HMAC-MD5 value.
- Secret – Type a text (1 to 31 characters) as s a unique identifier for each client on each DHCP server.

- WAN DNS – Select Auto or Manual.

  If Manual is selected, specify the primary and secondary DNS servers.

  IPv4 Primary DNS –IP address of primary DNS server.

  IPv4 Secondary DNS - IP address of secondary DNS server.

TSPC - Tunnel setup protocol client (TSPC) is an application which could help you to connect to IPv6 network easily.

Please make sure your IPv4 WAN connection is OK and apply one free account from hexago (http://gogonet.gogo6.com/page/freenet6-account) before you try to use TSPC for network connection. TSPC would connect to tunnel broker and requests a tunnel according to the specifications inside the configuration file. It gets a public IPv6 IP address and an IPv6 prefix from the tunnel broker and then monitors the state of the tunnel in background.

After getting the IPv6 prefix and starting router advertisement daemon (RADVD), the PC behind this router can directly connect to IPv6 the Internet.

- Tunnel Broker Address – Enter the address for the tunnel broker IP, FQDN or an optional port number.
- Username – It is suggested for you to apply another username and password for http://gogonet.gogo6.com/page/freenet6-account.
- Password - Enter the password assigned with the user name.
- WAN DNS – Select Auto or Manual.

  If Manual is selected, specify the primary and secondary DNS servers.

  IPv4 Primary DNS –IP address of primary DNS server.

  IPv4 Secondary DNS - IP address of secondary DNS server.

6in4 – Setup 6in4 Static Tunnel for WAN interface.

However, 6in4 offers a prefix outside of 2002::0/16. So, you can use a fixed endpoint rather than any cast endpoint. The mode has more reliability.

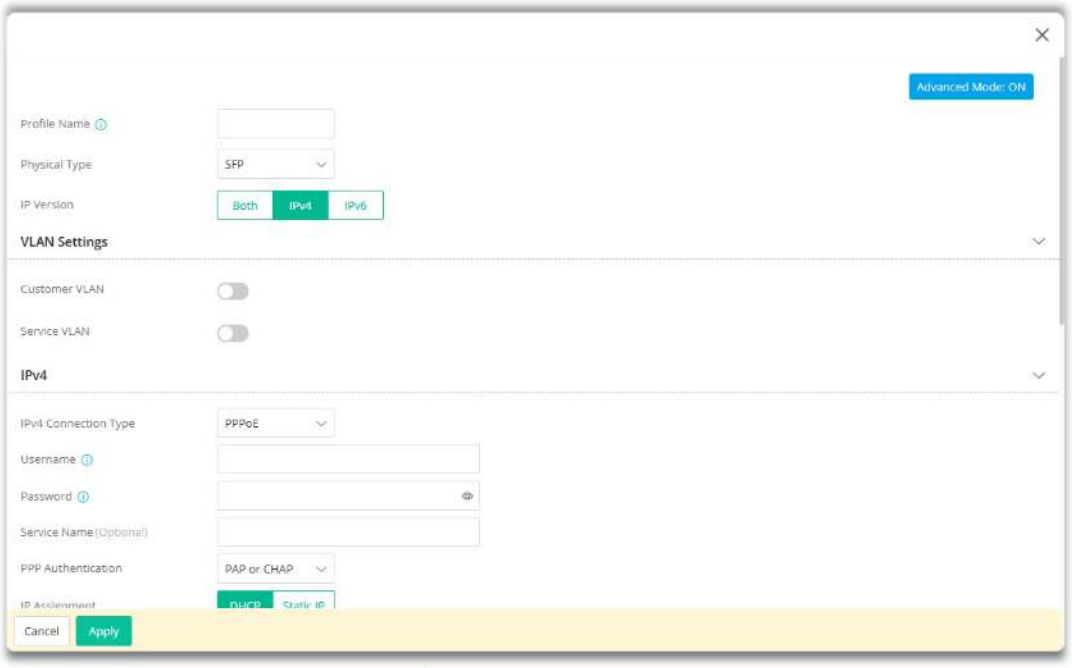
- Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6in4 connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through.
- Remote Endpoint IPv4 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Prefix Length – WAN IPv6 prefix length assigned by

	the tunnel provider. • LAN Routed Prefix – LAN IPv6 address prefix. • LAN Routed Prefix Length – LAN IPv6 address prefix length. • Tunnel TTL – Time to live value, which is the maximum number of hops allowed to the endpoint. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. 6rd - Setup 6rd for WAN interface. • Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6rd connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through. • Mode – Two options, Auto and Static. Auto - Used in conjunction with DHCPv4, the router automatically provisions IPv6 using option 212. Static - IPv6 configuration information is manually entered. • IPv4 Border Relay – Enter the IPv4 addresses of the 6rd Border Relay for a given 6rd domain. • 6rd Prefix – Enter the 6rd IPv6 address. • 6rd Prefix Length - Enter the IPv6 prefix length for the 6rd IPv6 prefix in number of bits. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS – IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server.
IPv6 WAN Connection Detection	
Mode	Configures how the WAN connection is monitored. Always On - The router assumes the WAN connection is always active. NS Detect - The router verifies connectivity by issuing Neighbor Solicitation packets. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request every second to the host, whose address is specified in the Ping IP field, to verify the WAN connection. If the remote host does not respond within 30 seconds, the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Primary Ping IP – Enter an IP address in this field for pinging. • Secondary Ping IP - Enter an IP address in this field for pinging. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN

	disconnection is judged.
MTU	
MTU	Maximum Transmission Unit, the size of the largest packet, in bytes, that can be transmitted to the WAN. The maximum value is 1500. For PPPoE connections, there is always an 8-byte overhead, so the maximum valid MTU value for PPPoE is 1492.
WAN MAC Address	
Mode	This feature is available only when Advanced Mode is activated. Default – Use the default MAC address for the WAN port. Customized - Select this option if your ISP authenticates by MAC addresses. • MAC - Specify a MAC address for the WAN Ethernet port.
MAC	Displays the MAC address of this device.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

AutoHunt with Physical Type of SFP

To add a new autohunt profile with physical type of DSL, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode:ON/OFF	Click to show or hide the advanced settings (IP Alias and WAN MAC Address) for the WAN interface.
Physical Type	Displays the physical type used by this interface.
IP Version	Set the protocol (IPv4 or IPv6 or both) that this WAN interface used.
VLAN Settings	

Customer VLAN	Switch the toggle to enable or disable 802.1Q VLAN tagging for the WAN connection. When enabled, the WAN traffic will be tagged with the specified VLAN ID, which is often required by the ISP for internet connectivity. Tag - Enter the VLAN ID number required by your ISP. The range is from 1 to 4094. Priority - Enter the 802.1p packet priority number. The range is from 0 to 7.
Service VLAN	Switch the toggle to enable or disable Service VLAN (QinQ) tagging. When enabled, the device adds an outer VLAN tag (S-TAG) on top of the Customer VLAN tag, encapsulating traffic for ISP or upstream carrier network transport. Tag - Enter the Service VLAN ID number. The range is from 1 to 4094 Priority - Enter the packet priority number for the Service VLAN. The range is from 0 to 7.
IPv4	
IPv4 Connection Type	It is available when Both or IPv4 is selected as IP Version. PPPoE – Set the access mode as PPPoE. • Username – Username provided by the ISP for PPPoE authentication. • Password – Password provided by the ISP for PPPoE authentication. • Service Name (Optional) – PPP service name tag. Required by some ISPs. Leave blank unless instructed otherwise by your ISP. • PPP Authentication – The protocol used for PPP authentication. PAP or CHAP - Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use. • IP Assignment – It is available when PPPoE is selected as IPv4 Connection Type. DHCP - WAN IP address is dynamically allocated. Static IP - ISP has assigned a fixed WAN IP address. Enter an IP address. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. DHCP – The router receives IP configuration information from a DHCP server. • WAN DNS – Select Auto or Manual. If Manual is selected, specify the primary and secondary DNS servers. IPv4 Primary DNS –IP address of primary DNS server. IPv4 Secondary DNS - IP address of secondary DNS server. Static IP – Set the access mode as Static IP. • IP Address – WAN IP address assigned by the ISP.

	• Subnet Mask – WAN subnet mask. • Gateway IP – IP address of the WAN Gateway. • IPv4 Primary DNS – IP address of primary DNS server. • IPv4 Secondary DNS - IP address of secondary DNS server.
	WAN Connection Detection
Mode	Configures how the WAN connection is monitored. Select ARP Detect, PPP Detect or Ping Detect or Always On according to the IPv4 Connection Type. ARP Detect - A method which detects if a WAN interface is active by sending the ARP requests to the gateway. PPP Detect – A method which detects if PPP connection between the router and the ISP is successful or not. Always On - The router assumes the WAN connection is always active. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request every second to the host, whose address is specified in the Ping IP field, to verify the WAN connection. If the remote host does not respond within 30 seconds, the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Ping Gateway IP - Switch the toggle to enable/ use the current WAN gateway IP address for pinging. With the IP address(es) pinging, Vigor router can check if the WAN connection is on or off. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
IP Alias	IPv4 Alias - If you have multiple public IP addresses and would like to utilize them on the WAN interface, please use WAN IP Alias. You can set up to 8 public IP addresses other than the current one you are using. +Add – Click to add an IPv4 address as the IPv4 alias.
	IPv6
IPv6 Connection Type	It is available when Both or IPv6 is selected as IP Version. Offline – When Offline is selected, the IPv6 connection will be disabled. PPP – IPv6 WAN address is assigned along with the IPv4 WAN address during PPPoE negotiation. This IPv6 access mode requires that the IPv4 uses PPPoE. Static – Configure an ISP-assigned static IPv6 setuvgp. • +Add –Click this button to add the values in the IPv6 Address and Prefix Length fields to the Global Address Table. • IPv6 Global Address – WAN IPv6 address assigned by the ISP. • Prefix Length – Length of the IPv6 prefix. • Gateway Address - IPv6 address of the ISP gateway. DHCPv6 – Use DHCPv6 protocol to obtain IPv6 address from

server.

- IAID – Unique integer that identifies this WAN interface.
- Authentication Protocol - This protocol will be used for the client to be authenticated by DHCPv6 server before accessing into Internet. There are three types can be specified, Reconfigure Key, Delayed and None.

  None - In general, the default setting is None.

  Reconfigure Key – During the connection process, DHCPv6 server will authenticate the client automatically.

  Delayed - During the connection process, DHCPv6 server will authenticate and identify the client based on the key ID, realm and secret information specified in these fields.

  Key ID – Type a value (range from 1 to 65535) which will be used to generate HMAC-MD5 value.

  Realm – The name (1 to 31 characters) typed here will identify the key which generates HMAC-MD5 value.

  Secret – Type a text (1 to 31 characters) as s a unique identifier for each client on each DHCP server.

TSPC - Tunnel setup protocol client (TSPC) is an application which could help you to connect to IPv6 network easily.

Please make sure your IPv4 WAN connection is OK and apply one free account from hexago (http://gogonet.gogo6.com/page/freenet6-account) before you try to use TSPC for network connection. TSPC would connect to tunnel broker and requests a tunnel according to the specifications inside the configuration file. It gets a public IPv6 IP address and an IPv6 prefix from the tunnel broker and then monitors the state of the tunnel in background.

After getting the IPv6 prefix and starting router advertisement daemon (RADVD), the PC behind this router can directly connect to IPv6 the Internet.

- Tunnel Broker Address – Enter the address for the tunnel broker IP, FQDN or an optional port number.
- Username – It is suggested for you to apply another username and password for http://gogonet.gogo6.com/page/freenet6-account.
- Password - Enter the password assigned with the user name.

6in4 – Setup 6in4 Static Tunnel for WAN interface.

However, 6in4 offers a prefix outside of 2002::0/16. So, you can use a fixed endpoint rather than any cast endpoint. The mode has more reliability.

- Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6in4 connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through.
- Remote Endpoint IPv4 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Address – WAN IPv6 address assigned by the tunnel provider.
- 6in4 IPv6 Prefix Length – WAN IPv6 prefix length assigned by the tunnel provider.
- LAN Routed Prefix – LAN IPv6 address prefix.
- LAN Routed Prefix Length – LAN IPv6 address prefix length.

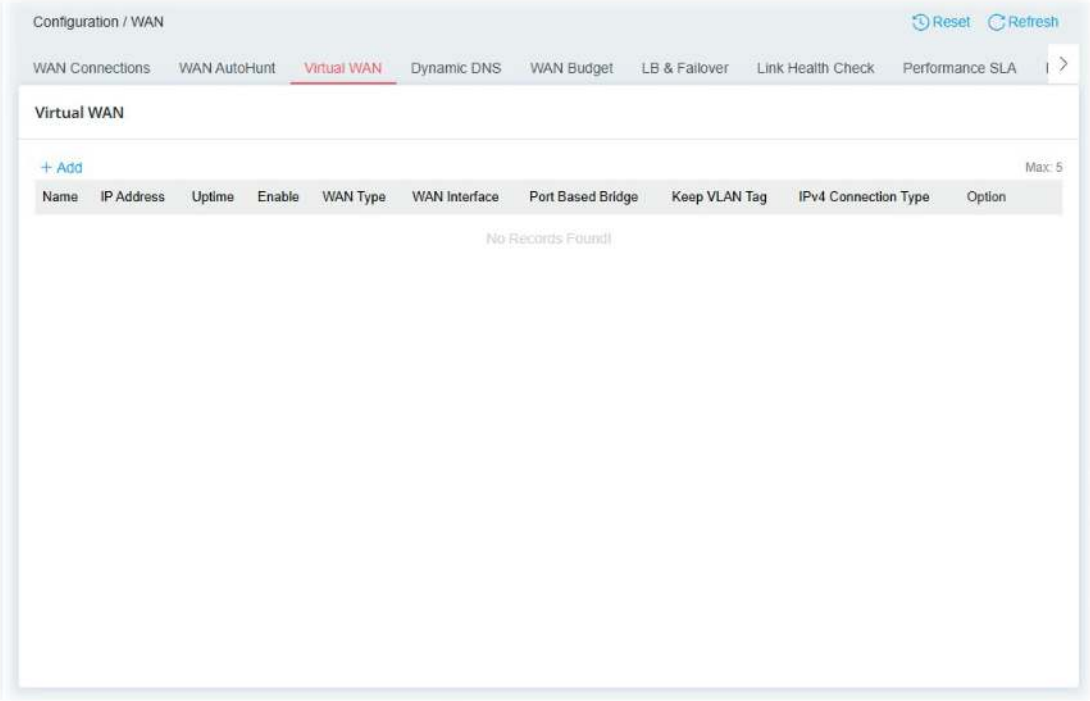
	• Tunnel TTL – Time to live value, which is the maximum number of hops allowed to the endpoint. 6rd - Setup 6rd for WAN interface. • Enable IPv4 WAN Ping Access for 6in4/6rd Tunnel – To use this 6rd connection type, IPv4 WAN access must be allowed, and the firewall must allow the Tunnel Broker IP address to pass through. • Mode – Two options, Auto and Static. Auto - Used in conjunction with DHCPv4, the router automatically provisions IPv6 using option 212. Static - IPv6 configuration information is manually entered. IPv4 Border Relay – Enter the IPv4 addresses of the 6rd Border Relay for a given 6rd domain. 6rd Prefix – Enter the 6rd IPv6 address. 6rd Prefix Length - Enter the IPv6 prefix length for the 6rd IPv6 prefix in number of bits.
IPv6 WAN Connection Detection	
Mode	Configures how the WAN connection is monitored. Always On - The router assumes the WAN connection is always active. NS Detect - The router verifies connectivity by issuing Neighbor Solicitation packets. Ping Detect - The router sends an ICMP (Internet Control Message Protocol) echo request every second to the host, whose address is specified in the Ping IP field, to verify the WAN connection. If the remote host does not respond within 30 seconds, the WAN connection is deemed to have failed. If you choose Ping Detect as the detection mode, you have to enter required settings for the following items. • Primary Ping IP – Enter an IP address in this field for pinging. • Secondary Ping IP - Enter an IP address in this field for pinging. • TTL –Time To Live, the maximum allowed number of hops to the ping destination. Valid values range from 1 to 255. • Ping Interval (Sec, 10-3600) – Enter the interval for the system to execute the PING operation. • Ping Retry - Enter the number of times that the system is allowed to execute the PING operation before WAN disconnection is judged.
MTU	
MTU	Maximum Transmission Unit, the size of the largest packet, in bytes, that can be transmitted to the WAN. The maximum value is 1500. For PPPoE connections, there is always an 8-byte overhead, so the maximum valid MTU value for PPPoE is 1492.
WAN MAC Address	
Mode	This feature is available only when Advanced Mode is activated. Default – Use the default MAC address for the WAN port. Customized - Select this option if your ISP authenticates by MAC addresses. • MAC - Specify a MAC address for the WAN Ethernet port.

MAC	Displays the MAC address of this device.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

II-1-2-3 Virtual WAN

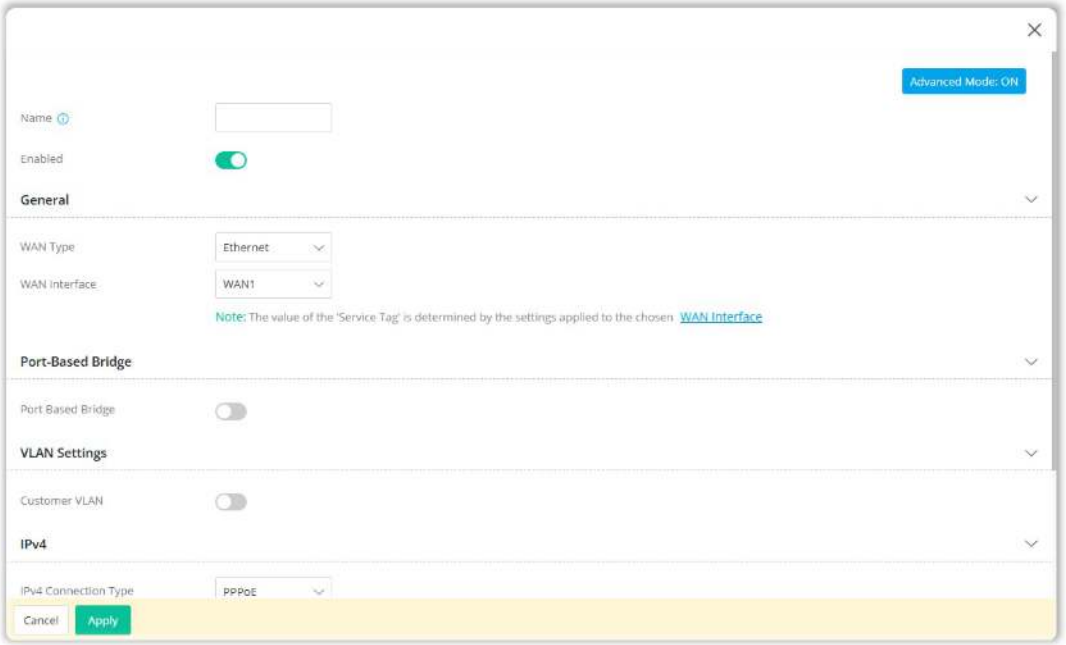
Up to five virtual WAN profiles can be set for applying to different applications.

Each profile can be specified with VLAN and binding interfaces according to the requirements of the practical network environment.



Item	Description
Reset	Click to clear all profiles to factory settings.
+Add	Click to bring up the configuration page of the virtual WAN profile (max. 5).

To add a new virtual WAN, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Advanced Mode: ON/OFF	Click to show or hide the advanced settings for virtual WAN.
Name	Enter a name as the profile name.
Enabled	Switch the toggle to enable or disable the function.
	General
WAN Type	Displays the type (e.g., Ethernet) of the physical interface.
WAN Interface	Select one of the available WAN interfaces (enabled on WAN>>WAN Connections).
	Port-Based Bridge
Port Based Bridge	Switch the toggle to enable or disable the function.
Binding Interface	Select an interface for binding
Keep VLAN Tag	Enable this function to keep the VLAN tag while in port-based bridge mode. Some IPTV environments may require it. It depends on the user environment to decide whether to enable it. Default is disabled.
Multicast Stream VLAN Trans	Switch the toggle to enable or disable the function. In some areas, the multicast VLAN tag value might be different from the IGMP VLAN tag. That might cause data transfer issues for IPTV packets flooding to other VLAN ports while watching the IPTV program. Configure the IGMP VLAN tag and the multicast VLAN tag with the same value if required. Downstream Multicast VLAN Tag – Enter the value for tagging the multicast packet. The range is from 0 to 4094. Upstream IGMP VLAN Tag – Enter the value for tagging the IGMP packet. The range is from 0 to 4094.

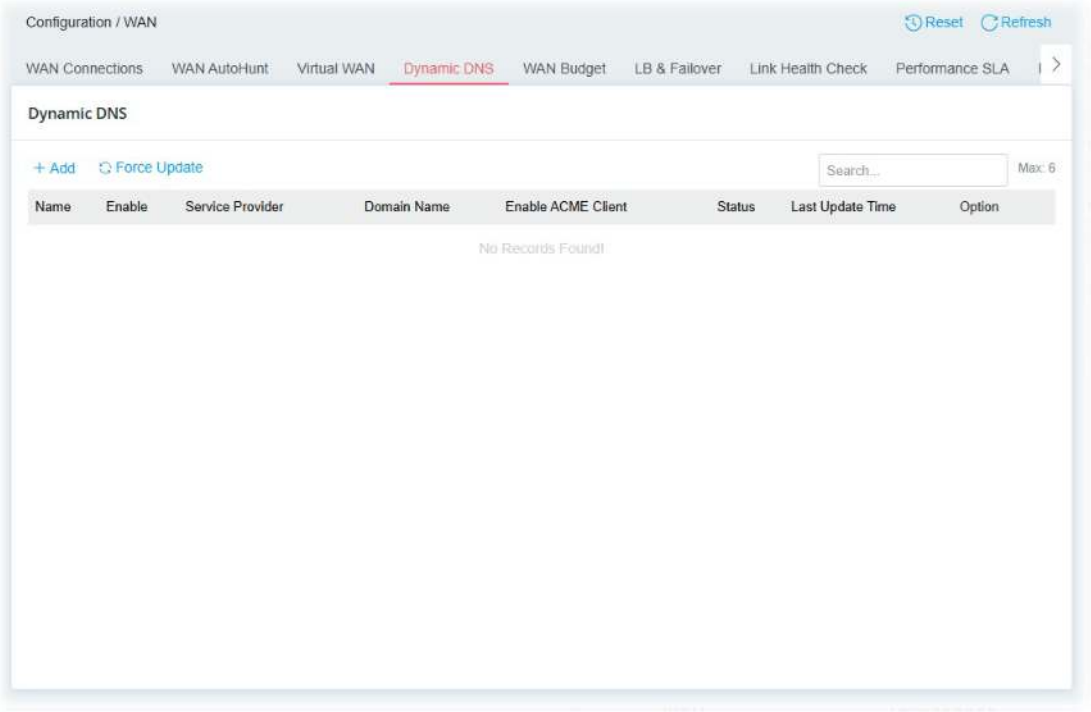
VLAN Settings	
Customer VLAN	Switch the toggle to enable or disable 802.1Q VLAN tagging for the WAN connection. When enabled, the WAN traffic will be tagged with the specified VLAN ID, which is often required by the ISP for internet connectivity. Tag - Enter the VLAN ID number required by your ISP. The range is from 1 to 4094. Priority - Enter the 802.1p packet priority number. The range is from 0 to 7.
IPv4	
IPv4 Connection Type	It is available when Port Based Bridge is inactive. PPPoE – Set the access mode as PPPoE. • Username – Username provided by the ISP for PPPoE authentication. • Password – Password provided by the ISP for PPPoE authentication. • PPP Authentication – The protocol used for PPP authentication. PAP or CHAP - Both PAP and CHAP (Challenge-Handshake Authentication Protocol) can be used for PPP authentication. Router negotiates with the PPTP or L2TP server to determine which protocol to use. • IP Assignment – It is available when PPPoE is selected as IPv4 Connection Type. DHCP - WAN IP address is dynamically allocated. Static IP - ISP has assigned a fixed WAN IP address. Enter an IP address. DHCP – The router receives IP configuration information from a DHCP server. • Router Name (Optional) – Used by some ISPs. Contact your ISP for the appropriate values. • Domain Name (Optional) - Used by some ISPs. Contact your ISP for the appropriate values. Static IP – Set the access mode as Static IP. • IP Address – WAN IP address assigned by the ISP. • Subnet Mask – WAN subnet mask. • Gateway IP – IP address of the WAN Gateway.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-2-4 Dynamic DNS

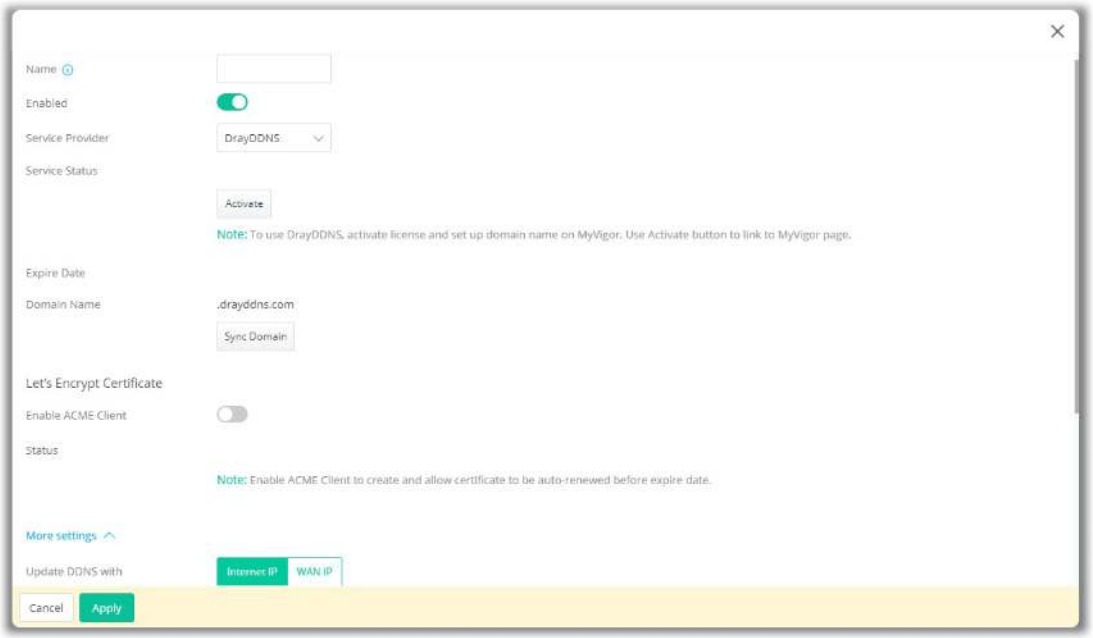
Most ISPs assigns dynamic WAN IP addresses to their customers. Dynamic IP addresses presents challenges to users who would like to accept remote connections to their LANs from the Internet, as service could be disrupted due to the IP address changing without notice. By setting up service with a Dynamic DNS (DDNS) provider, and configuring Dynamic DNS updates on the Vigor router, you can have reliable access to your network by means of an easy-to-remember domain address that resolves to the most current WAN IP address.

The Vigor router supports a wide range of DDNS providers. Please contact the DDNS provider of your choice to set up service before configuring DDNS on the router.



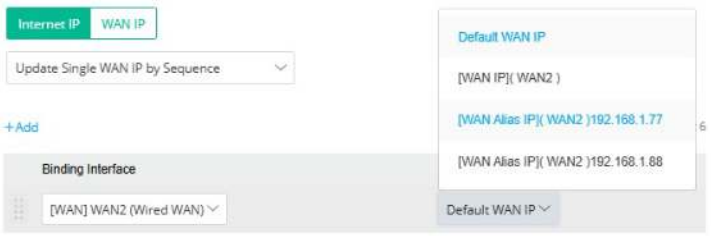
Item	Description
Reset	Click to clear all profiles to factory settings.
+Add	Click to bring up the configuration page of the DDNS profile (max. 6).
Force Update	Click to connect immediately to DDNS servers to update IP address information.

To add a new DDNS profile, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter a name as the profile name.
Enabled	Switch the toggle to enable or disable the function.
Service Provider	Select the DDNS provider. If your DDNS provider is not listed, select User-Defined and manually configure the profile. ● DrayDDNS ● NO-IP ● Dyn.com ● 58DDNS ● UBDDNS ● User-Defined
If DrayDDNS is selected as Service Provider	Service Status - Click Activate to activate the service. Expire Date - Display the expired date of the service. Domain Name - Display the domain and sub-domain to be updated. Sync Domain – The domain name for DrayDDNS is set on the MyVigor server. Click this button to load and obtain the domain name if it is available.
If NO-IP, Dyn.com, 58DDNS or UBDDNS is selected as Service Provider	Domain Name - The domain and sub-domain to be updated. Account Name - Enter the login name of the DDNS account. Password - Enter the password of the DDNS account.
If User-Defined is selected as Service Provider	Provider Host URL - Enter the IP address or the domain name of the host which provides related service. Service API - Enter the IP address or the domain name of the host which provides related service. Server Response - Enter any text that you want to receive from the DDNS server. Account Name - Enter the login name of the DDNS account.

	Password - Enter the password of the DDNS account. Auth Type –Two types can be used for authentication. ● Basic – Username and password defined later can be shown from the packets captured. ● URL - Username and password defined later can be shown in URL.
Let's Encrypt Certificate	Enable ACME Client – Switch the toggle to generate a certificate issued by Let's Encrypt for applying to such DDNS account. Status – Display the information related to Let's Encrypt certificate. It is not available when User-Defined is selected as the service provider.
	More settings
Update DDNS with	If a Vigor router is installed behind any NAT router, you can enable this function to locate the real WAN IP. When the WAN IP used by Vigor router is private IP, this function can detect the public IP used by the NAT router and use the detected IP address for DDNS update. There are two methods offered for you to choose: Internet IP –The real public IP address will be used. Select this option if the IP address assigned to the router's WAN interface is not the actual external IP address. WAN IP – The IP address of the router's WAN interface will be used.
Update WAN IP Mode	It is available when DrayDDNS is set as the Service Provider. Update All Selected WAN IPs – The Vigor router system will update all selected WAN IPs. Update Single WAN IP by Sequence – The Vigor router system will update the WAN IP in sequence. +Add – Click to add IP address (up to six). ● Binding Interface – Select an interface (WAN1 to WAN6) for traffic passing through. Up to six interfaces can be defined. ● Interface IP – If there is any IP alias configured before, available item(s) will be shown in this field. The first IP listed in the Binding Interface is the default IP. Select one of the items to match the binding interface. 
Protocol	Select the IP type (IPv4 or IPv6, or Any) of the IP address that would be used for answering to the DDNS service provider.
Auto Update Interval	The frequency, in minutes, at which the router connects to DDNS servers to update IP address information. The default is 14400.
Cancel	Discard current settings and return to previous page.

Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

DrayDDNS Settings

DrayDDNS, a DDNS service developed by DrayTek, can record multiple WAN IP (IPv4/IPv6) on single domain name. It is convenient for users to use and easily to set up with MyVigor. Each Vigor Router is available to register one domain name to MyVigor for one year license.

DDNS updates take place when:

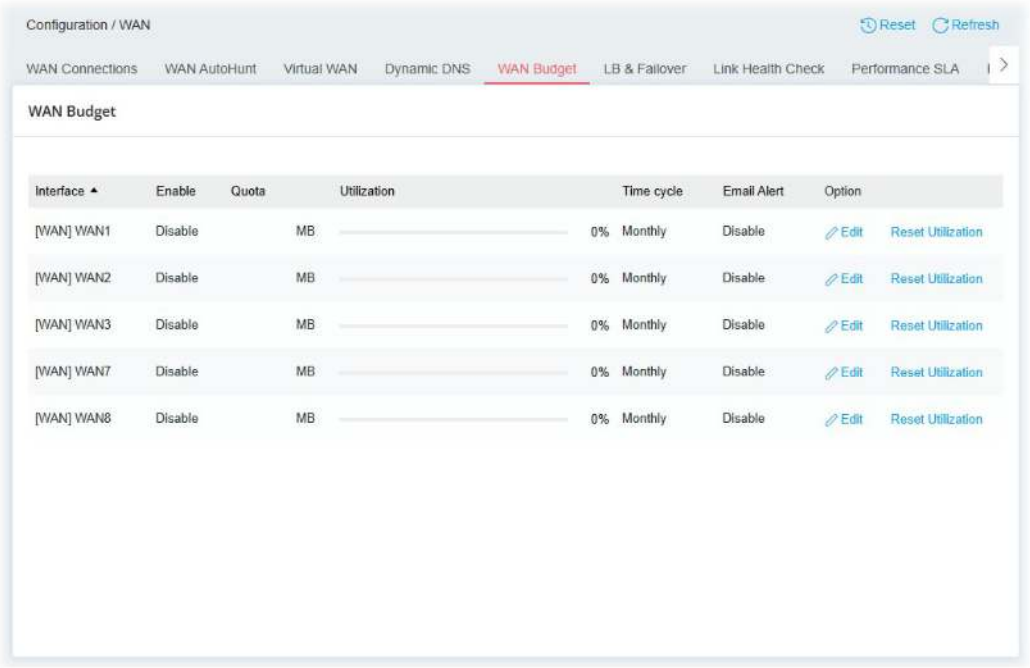
- The router is powered on or rebooted.
- The public IP address of any WAN interface changes.
- The online status of a WAN interface changes (going from online to offline or vice versa).
- The DDNS function is changed from “disabled” to “enabled”.
- A DDNS entry is modified and enabled.
- The Auto Update Interval has elapsed.
- Pressing the Force Update.

II-1-2-5 WAN Budget

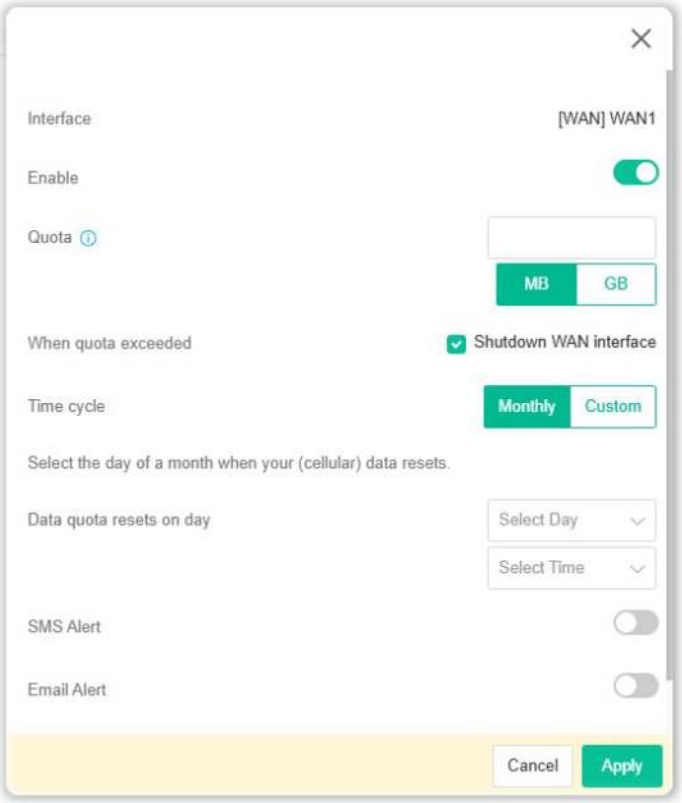
This function is used to determine the data *traffic volume* for each WAN interface respectively to prevent overcharges for data transmission by the ISP. Please note that the Quota Limit and Billing cycle day of month settings will need to be configured correctly first in order for some period calculations to be performed correctly.

The WAN Budget feature allows you to conveniently keep track of Internet traffic volume. You can:

- set up calendar cycles to monitor;
- limit your Internet usage according to your ISP's quota;
- set up action(s) to take when the quota is exceeded.



To edit a profile, click the **Edit** link to get the following page.



Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable or disable the profile. When enabled, the WAN Budget is enabled for this WAN.
Quota	Enter the data traffic quota allowed for such WAN interface. There are two unit (MB and GB) offered for you to specify.
When quota exceeded	Shutdown WAN interface - All the outgoing traffic through such WAN interface will be halted when the traffic has exceeded the budget limit.
Time Cycle	Monthly – Some ISP might apply for the network limitation based on the traffic limit per month. This setting is to offer a mechanism of resetting the traffic record every month. Custom - This setting allows the user to define the billing cycle according to his request. The WAN budget will be reset with an interval of billing cycle.
When Monthly is selected as the Time Cycle	Data quota resets on day - You can determine the starting day in one month.
When Custom is selected as the Time Cycle	Monthly is default. If long period or a short period is required, use Custom. The period of cycle duration is between 1 day and 30 days. You can determine the cycle duration by specifying the days and the hours. In addition, you can specify which day of today is in a cycle. Cycle duration (Days) – Specify the days (1~31) to reset the traffic record. Cycle duration (Hours) – Specify the hours (0~23) to reset the traffic record. Start Date – Specify the day in the cycle as the starting point

	which Vigor router will reset the traffic record. Start Time (Hr:Min.) - Specify the time for data quota rest in the cycle as the starting point which Vigor router will reset the traffic record.
SMS Alert	Switch the toggle to enable or disable the function. Send Alert SMS to – The system will send out SMS message to the user specified here when the quota is running out (less than 10%).
Email Alert	Switch the toggle to enable or disable the function. Send Alert Email to – The system will send out a warning message to the user specified here when the quota is running out (less than 10%).
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

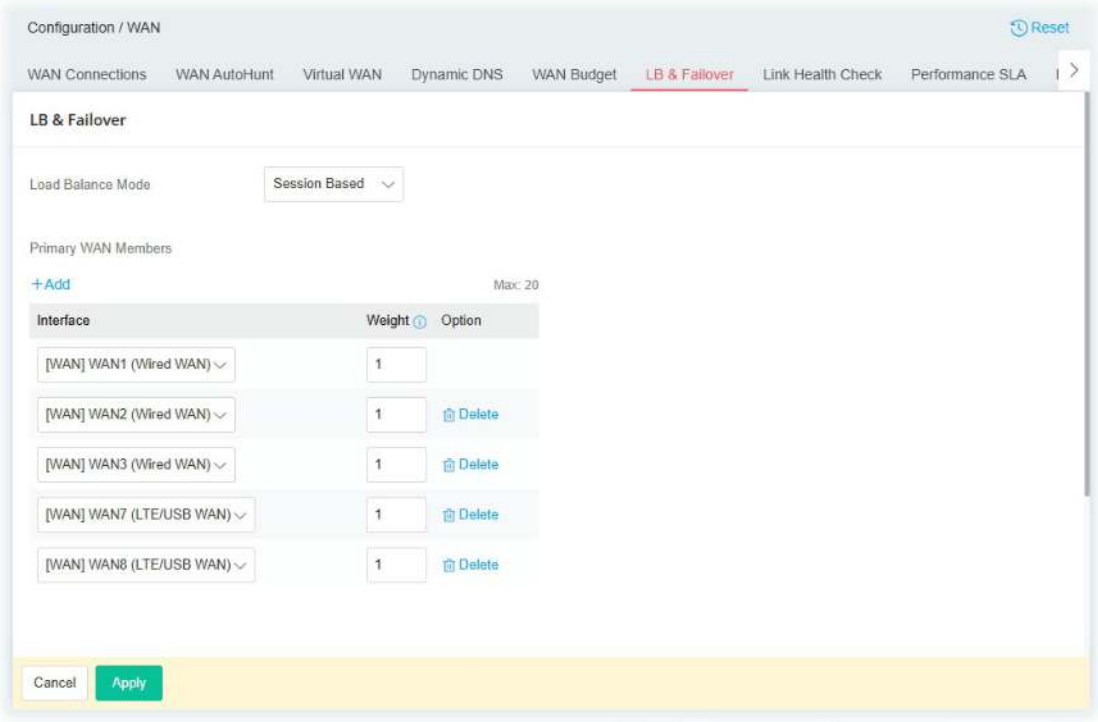
After finishing this web page configuration, please click Apply to save the settings.

II-1-2-6 LB & Failover

This page allows to configure settings for load balance and failover WAN.

Failover allows the traffic to be forwarded to an alternate interface if the specified interface loses connection.

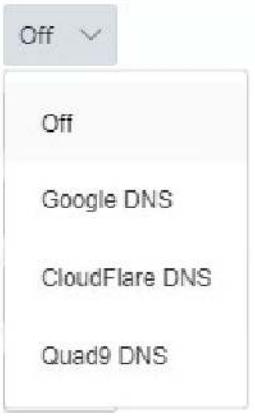
LB (load balance) can avoid excessive load on a single server by distributing the load, optimizing resource usage, and preventing a single server failure. The Vigor router can distribute the inbound NAT sessions among the servers with the configured load balance weight.



Available settings are explained as follows:

Item	Description
Load Balance Mode	IP Based – For ensuring the consistency of user sessions, this function will lead the requests from a specific client (listed on Interface/Weight) to the same server. However, it may not distribute traffic evenly once many requests come from the same client. Session Based – This option offers more evenly and effectively distributed traffic by considering IP address, full session details and current load conditions. The primary WAN interface will be used (as out-going WAN) for passing through new sessions to get better transmission speed. Though good speed test result for throughput might be reached; however, some web site may not open smoothly, especially the site need authentication, e.g., FTP.
Primary WAN Members	+Add – Click to create a new entry. Interface – Select a WAN interface. This WAN will be used for network connection in default. However, if all the primary WAN interfaces lose connection, the failover WAN members will take over the network connection based on priority. Weight - Select the weight value (1 to 255) for this entry. Option (Delete) – Click to remove the selected entry.

Failover WAN Members	Display all the active WAN interfaces which will run as failover WAN. If the interface specified in this field loses connection or is detected unsuccessfully, traffic can be forwarded to an alternate interface. +Add – Click to create a new entry. Interface – Select a Failover WAN interface. This WAN is intended to serve as a backup when other WAN ports specified have lost connection. Priority – Determine the priority of the failover WAN. The less the number is, the more it is used first as a backup WAN. All failover WANs can have the same priority value. When the primary WAN loses connection, all failover WAN members will activate the network connection. Weight - Select the weight value (1 to 255) for this entry. Option (Delete) – Click to remove the selected entry.
Advanced Settings	
Failback	The administrator can enable Failback to clear the existing session on Failover interface and return to the original interface immediately once the original interface resume its service. Packets will be sent through another Interface or follow another policy when the original interface goes down (Failover to). Once the original interface resumes service (Failback), the packets will be returned to it immediately. Switch the toggle to enable / disable the function.
Restore Link Checks	It is available if Failback is enabled. Enter a value that will enable the system to determine the number of checks required for the link. Once the link is successfully checked, the connection will be restored.
Link Health Check and SLA	Switch the toggle to enable the function. If disabled, the active WAN interface will be determined based on WAN connection detection mode defined in the WAN Connections Profile. If enabled, the WAN connection detection defined in the WAN Connections Profile will be ignored. The router will measure the performance of interface members, and active interfaces will be determined using Link Health Check and Performance SLA. Interface Link Health & SLA – List the available WAN interfaces for setting different health check methods. • Interface – Display the WAN interfaces. • Link Health Check Profile – Select one of the available check profiles (defined on Configuration>>WAN>>Link Health Check) for the interface.

	 • Performance SLA – Select one of the available check profiles (defined on Configuration>>WAN>>Performance SLA) for the interface.
Failure Retry Checks	Specify how many times for the system to check the connections. If all attempts fail, the system will determine that the connection is unstable.
Load Balance Exception List	Establish an exception list that will utilize a fixed WAN instead of Multiple WAN Load Balancing. +Add – Click to create a new entry (up to 10). Enable – Switch the toggle to enable the entry. Comment – Enter a brief description for identification. Service Type –S elect the service type to which this entry applies. Service is a predefined or user-defined type of traffic that uses certain protocols or ports. To set up a custom service, select Customized to set the service name, the protocol, and port number. Protocol – Select TCP, UDP or TCP/UDP for the service type. Source Port – Enter a port number for the source IP address. Destination – Enter the destination IP address. Destination Port – Enter a port number for the destination IP address. Option (Delete) – Click to remove the selected entry.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

II-1-2-7 Link Health Check

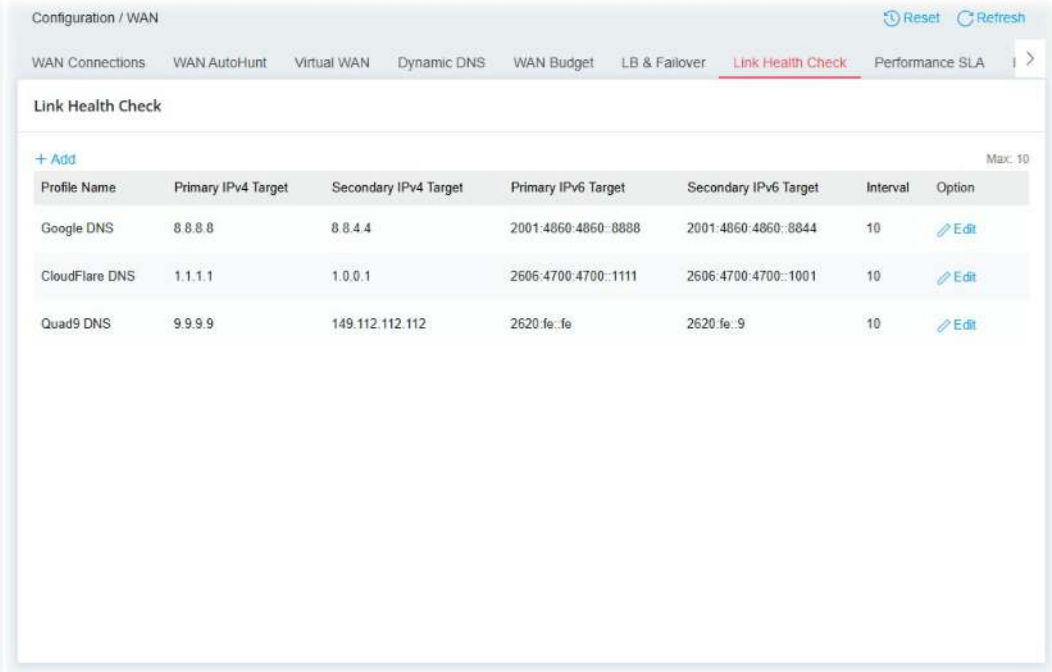
Link Health Check is used for specifying the IPs (IPv4 and IPv6) that need to be verified to ensure network connectivity via ping/httping.

This page allows you to create profiles for executing the link health of the WAN interface.

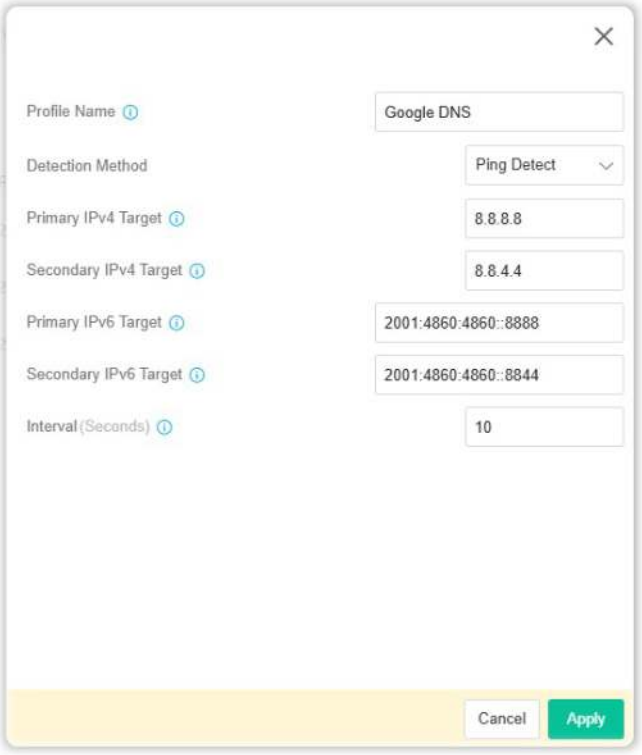
By default, the system offers standard health check options such as Google DNS, CloudFlare DNS, and Quad9 DNS.

Take Google DNS as an example. This profile indicates that primary/secondary IPv4 target (8.8.8.8/8.8.4.4) is used for checking IPv4 network connection, while primary/secondary IPv6 target (2001:4860:4860::8888, 2001:4860:4860::8844) is used for checking IPv6 network connection. Network connection detection is performed per 10 seconds. If one of the IPv4 and

IPv6 addresses is detected connection unsuccessfully, it will be judged as checking network connection failure.



To add/edit a profile, click the +Add/Edit link to get the following page.



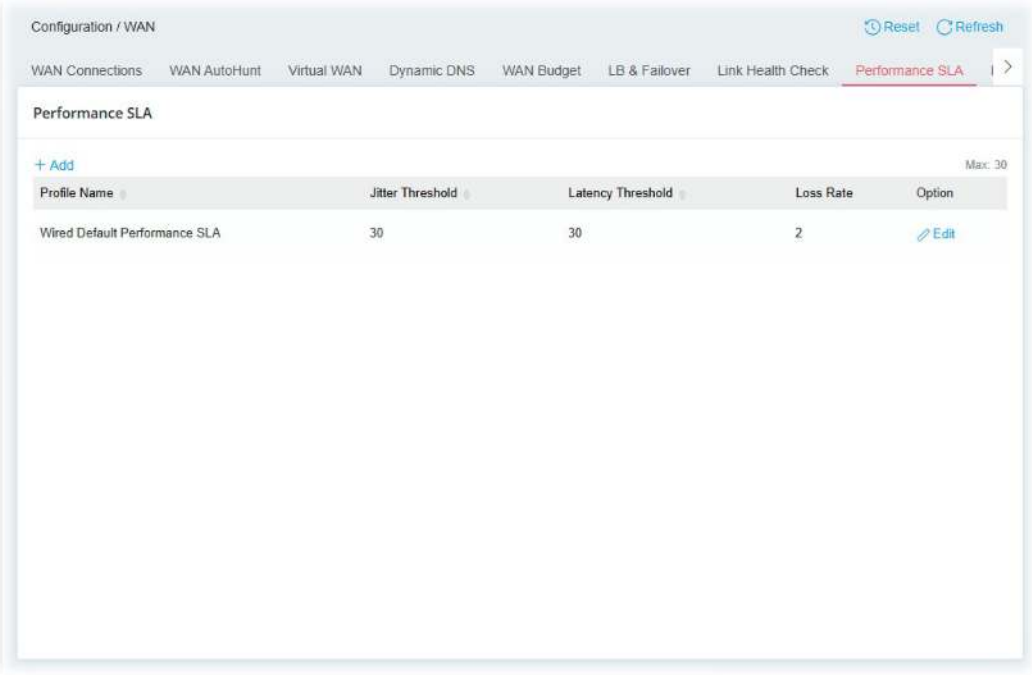
Available settings are explained as follows:

Item	Description
Profile Name	Enter a name as the Link Health Check profile.
Detection Method	Select the protocol for ping detection. • HTTP Detect • Ping Detect

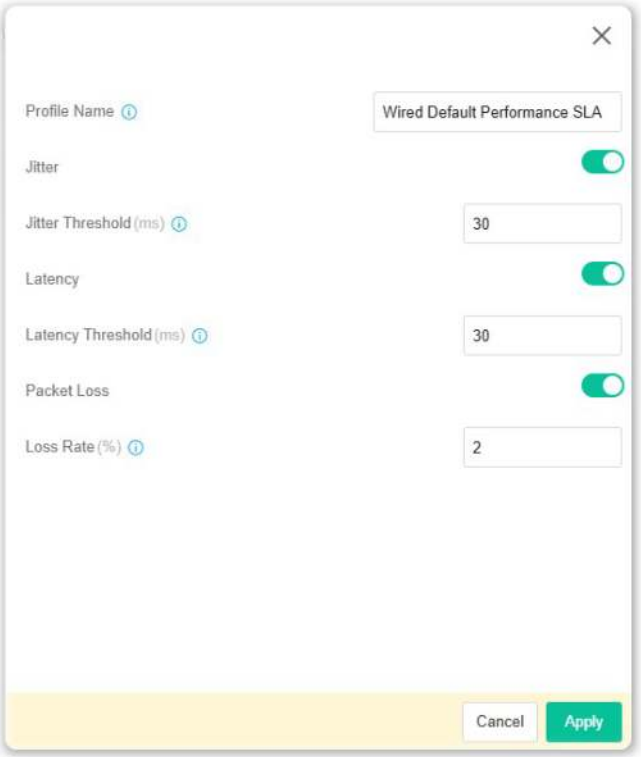
Primary IPv4 Target	Enter the first IPv4 address as the primary target for health check.
Secondary IPv4 Target	Enter the second IPv4 address as the secondary target for health check.
Primary IPv6 Target	Enter the first IPv6 address as the primary target for health check.
Secondary IPv6 Target	Enter the second IPv6 address as the secondary target for health check.
Interval	Set the time interval (unit is second) for network detection or checking.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

II-1-2-8 Performance SLA

This page allows you to set the thresholds for jitter, latency, and loss for Performance SLA (Service Level Agreement), which will be used for detecting the health status of the WAN connection.



To add/edit a profile, click the **+Add/Edit** link to get the following page.



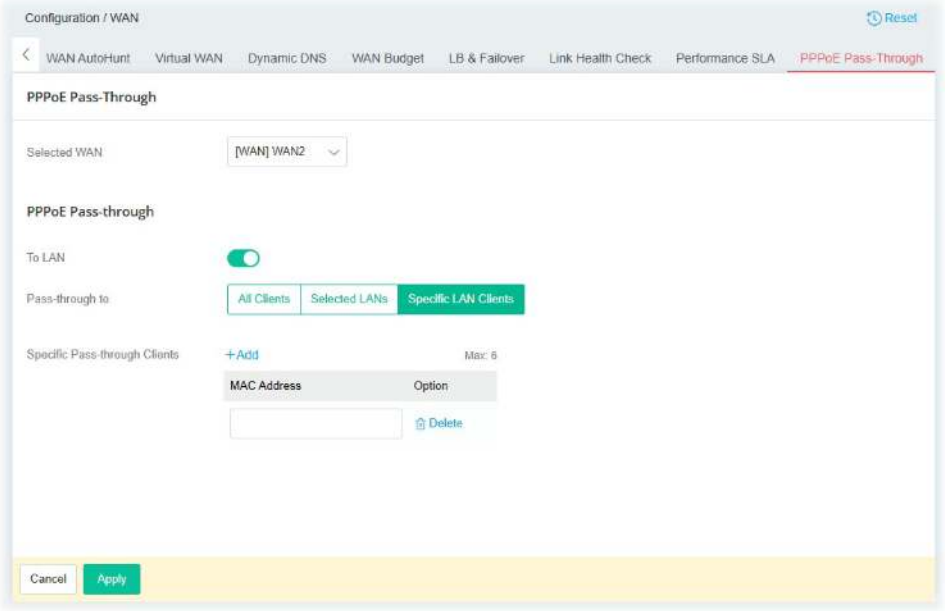
Available settings are explained as follows:

Item	Description
Profile Name	Enter a name as the Link Health Check profile.
Jitter	Switch the toggle to enable or disable the jitter function. Jitter Threshold - It defines the change rate of latency. For stable session, small jitter value will be better. When the detected value is greater than the value set here, the connection will be regarded as unstable and connection failure.
Latency	Switch the toggle to enable or disable the latency function. Latency Threshold - It defines the time taken by Vigor router when sending the packets to the IP set in Link Condition Detection. When the detected value is greater than the value set here, the connection will be regarded as unstable and connection failure.
Packet Loss	Switch the toggle to enable or disable the packet loss function. Loss Rate - It defines the proportion that packets will be discarded before arriving at the IP set in Link Condition Detection. When the detected value is greater than the value set here, the connection will be regarded as unstable and connection failure.
Cancel	Discard current settings and return to previous page.
Apply	Save the current settings and exit the page.

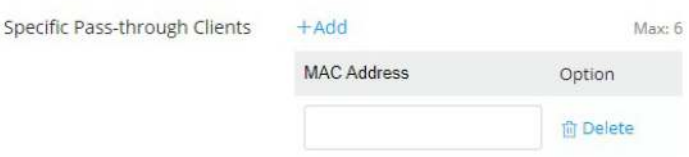
II-1-2-9 PPPoE Pass Through

The router offers PPPoE dial-up connection. Besides, you also can establish the PPPoE connection directly from local clients to your ISP via the Vigor router. According to the WAN Connection Type, this feature will encapsulate the PPPoE package of local clients and send it to the WAN Server.

Thus, the PC can access Internet through such direction.



Available settings are explained as follows:

Item	Description
Selected WAN	Select a WAN interface for applying the PPPoE pass-through.
To LAN	Switch the toggle to enable or disable the function. If enabled, wired LAN clients can initiate PPPoE dial-up connections to the selected WAN.
Pass-through to	All Clients – All the wired LAN clients can initiate PPPoE dial-up connections to the selected WAN. Selected LANs – One or more LAN clients can initiate PPPoE dial-up connections to the selected WAN. Specific LAN Clients – Up to six specific LAN clients can initiate PPPoE dial-up connections to the selected WAN. • +Add –Click to add a new pass-through client. 
Cancel	Discard current settings.
Apply	Save the current settings.

After finishing this web page configuration, please click Apply to save the settings.

II-1-3 LAN

A LAN(Local Area Network) comprises a collection of LAN clients, which are networked devices on your premises. A LAN client can be a computer, a printer, a Voice-over-IP (VoIP) phone, a mobile phone, a gaming console, an Internet Protocol Television (IPTV), etc, and can have either a wired (using Ethernet cabling) or wireless (using Wi-Fi) network connection.

LAN clients within the same LAN are normally able to communicate with one another directly, as they are peers to one another, unless measures, such as firewalls or VLANs, have been put in place to restrict such access. Nowadays the most common LAN firewalls are implemented on the LAN client itself. For example, Microsoft Windows since Windows XP and Apple OS X have built-in firewalls that can be configured to restrict traffic coming in and going out of the computer. VLANs, on the other hand, are usually set up using network switches or routers.

To communicate with the hosts outside of the LAN, LAN clients have to go through a network gateway, which in most cases is a router that sits between the LAN and the ISP network, which is the WAN. The router acts as a director to ensure traffic between the LAN and the WAN reach their intended destinations.

IP Address

On most broadband networks, the ISP assigns a single WAN IP address to the subscriber. All LAN clients have to share this WAN IP address when accessing the Internet. To achieve this, a technique called Network Address Translation (NAT) is used. Under NAT, a private block of IP addresses is assigned to the LAN clients, which communicate with WAN hosts through the router, also known as the gateway.

On outgoing traffic to the WAN, the router makes note that a LAN client has attempted to reach a WAN host, and forwards the request to the intended WAN recipient.

On traffic incoming to the LAN from a WAN host, the router checks its records to see if a matching outstanding request from a LAN client to this WAN host exists, and if so, forwards it to the LAN client. Otherwise, the traffic is dropped.

There are 3 distinct blocks of IPv4 address that are reserved for use as private IP addresses on a LAN.

Name	IP Address Range	Number of Available Addresses	Largest Subnet Mask
24-bit Block	10.0.0.0 to 10.255.255.255	16,777,216	255.0.0.0
20-bit Block	172.16.0.0 to 172.31.255.255	1,048,576	255.240.0.0
16-bit Block	192.168.0.0 to 192.168.255.255	65,536	255.255.0.0

The default beginning IP Address of LAN 1 is 192.168.1.1, and the Subnet Mask is 255.255.255.0, for a total of 254 assignable IP addresses, from 192.168.1.1 to 192.168.1.254. The final IP address of the selected range is reserved for routing and cannot be assigned to a LAN client.

In most cases, the default IP address block should work satisfactorily. However, there are situations where you need to select a different address block, such as when you need to communicate with other LANs that already use the same address block.

Private IP addresses can be assigned automatically to LAN clients using Dynamic Host Configuration Protocol (DHCP), or manually assigned. The DHCP server can either be the router (the most common case), or a separate server, that hands out IP addresses to DHCP clients.

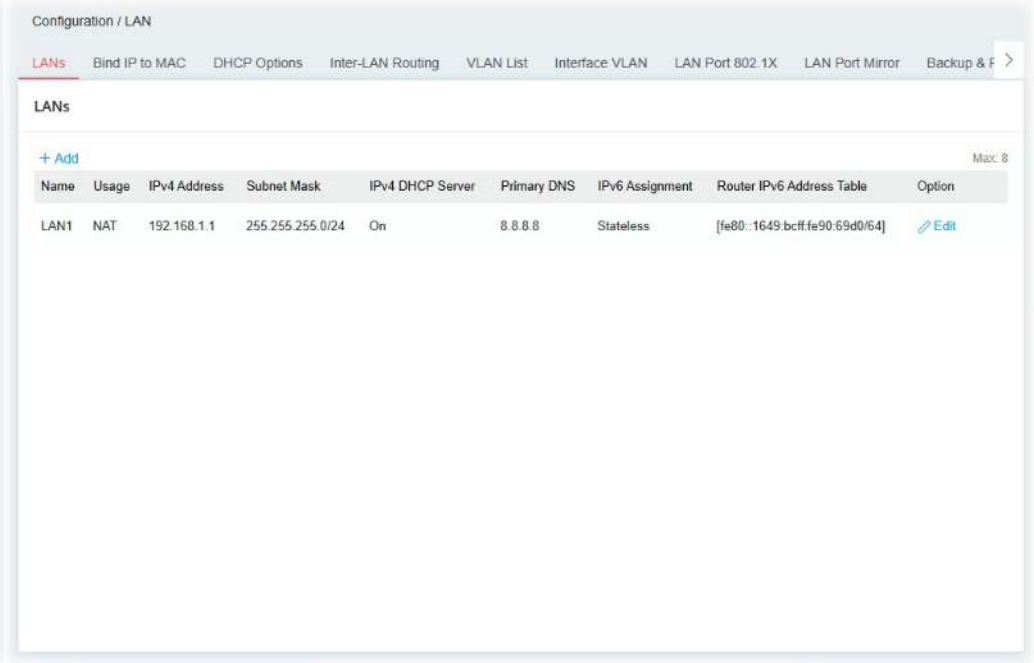
Alternatively, static IP addresses can be manually configured on LAN clients as part of their network settings. No matter how IP addresses are configured, it is important that no two devices get the same IP address. If both DHCP and static assignment are used on a network, it is important to exclude the static IP addresses from the DHCP IP pool. For example, if your LAN uses the 192.168.1.x subnet and you have 20 DHCP clients and 20 static IP clients, you could configure 192.168.1.10 as the Start IP Address, 50 as the IP Pool Counts (enough for the current

number of DHCP clients, plus room for future expansion), and use addresses greater than 192.168.1.100 for static assignment.

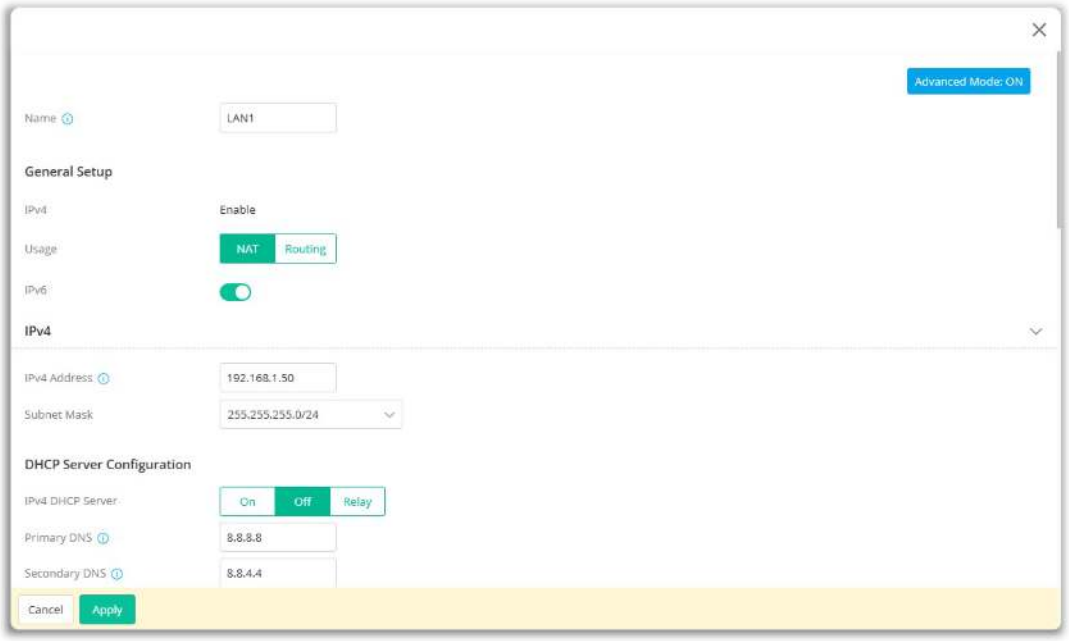
II-1-3-1 LANs

This page provides you the general settings for LAN.

Open **Configuration>>LAN** and click the **LANs** tab to open the following page.



To add/edit a profile, click the **+Add/Edit** link to get the following page. Here, we take LAN1 as an example.



Available settings are explained as follows:

Item	Description
Advanced Mode:	Click to show or hide the advanced settings for LAN.

ON/OFF	
Name	Display the name for identification. Change the name if required.
General Setup	
IPv4	Display the status (enable/disable) of the profile.
Usage	Select the IP forwarding method. • NAT • Routing
IPv6	Switch the toggle to configure / ignore the IPv6 settings.
IPv4	
IPv4 Address	This is the IP address of the LAN interface (default: 192.168.1.1).
Subnet Mask	Select a subnet mask of the LAN interface.
DHCP Server Configuration	
IPv4 DHCP Server	LAN1 is configured with DHCP in default. DHCP stands for Dynamic Host Configuration Protocol. The router by factory default acts a DHCP server for your network so it automatically dispatches related IP settings to any local user configured as a DHCP client. It is highly recommended that you leave the router enabled as a DHCP server if you do not have a DHCP server for your network. If you want to use another DHCP server in the network other than the Vigor Router's, you can let Relay Agent help you to redirect the DHCP request to the specified location. On - Enables the built-in DHCP server on the router. Off - Disables the built-in DHCP server on the router. Relay - When selected, all DHCP requests are forwarded to a DHCP server outside of the LAN subnet, and whose address is specified in the DHCP Server IP Address field.
If On is selected as DHCP Server	Start IP Address - The beginning LAN IP address that is given out to LAN DHCP clients. IP Pool Counts - The maximum number of IP addresses to be handed out by DHCP. The default value is 100. Valid range is between 1 and 253. Gateway IP Address - The IP address of the gateway, which is the host on the LAN that relays all traffic coming into and going out of the LAN. The gateway is normally the router. Lease Time - The maximum duration DHCP-issued IP addresses can be used before they have to be renewed. Primary DNS - DNS stands for Domain Name System. Every Internet host must have a unique IP address, also they may have a human-friendly, easy to remember name such as www.yahoo.com. The DNS server converts the user-friendly name into its equivalent IP address. Secondary DNS - You can specify secondary DNS server IP address here because your ISP often provides you more than one DNS Server.
If Relay is selected as DHCP Server	When selected, all DHCP requests are forwarded to a DHCP server outside of the LAN subnet, and whose address is specified in the

	DHCP Server IP Address field. Primary DNS - DNS stands for Domain Name System. Every Internet host must have a unique IP address, also they may have a human-friendly, easy to remember name such as www.yahoo.com. The DNS server converts the user-friendly name into its equivalent IP address. You must specify a DNS server IP address here because your ISP should provide you with usually more than one DNS Server. Secondary DNS - You can specify secondary DNS server IP address here because your ISP often provides you more than one DNS Server. DHCP Relay over WAN (Primary) – Switch the toggle to enable this function. Then, specify a WAN interface for the first DHCP Server. • Primary DHCP Server Interface – Use the drop-down list to choose a WAN interface for the first DHCP Server. Primary DHCP Server IP Address - Enter the IP Address of the DHCP server to which DHCP requests from LAN clients are forwarded. DHCP Relay over WAN (Secondary) - The secondary DHCP server is an optional setting. If required, specify a WAN interface for the second DHCP Server as a backup server. • Secondary DHCP Server Interface – Use the drop-down list to choose a WAN interface for the second DHCP Server. Secondary DHCP Server IP Address - Enter the IP Address of the DHCP server to which DHCP requests from LAN clients are forwarded.
IP Assignment for Teleworkers	The VPN client will receive an IP address from the DHCP pool or IP address range (defined below) for Teleworkers. Assignment Start IP – Enter an IP address that serves as the starting point of a range of IP addresses. Assignment End IP – Enter an IP address that serves as the end point of a range of IP addresses.
IPv6	
IPv6 Assignment	Configures the Managed Address Configuration flag (M-bit) in Route Advertisements. Stateless – M-bit is unset. DHCPv6(Stateful) – M-bit is set, which indicates to LAN clients that they should acquire all IPv6 configuration information from a DHCPv6 server. The DHCPv6 server can either be the one built into the Vigor router, or a separate DHCPv6 server. Manual – No configuration information is sent.
Router Advertisement Configuration	It is available when Stateless is selected as the IPv6 Assignment. The router advertisement daemon sends Router Advertisement messages, specified by RFC 2461, to a local Ethernet LAN periodically and when requested by a node sending a Router Solicitation message. These messages are required for IPv6 stateless auto-configuration. Generate Prefix From – Select the primary WAN interface which is capable to generate the prefix for IPv6 address. Use the drop down list to specify a WAN interface for IPv6.

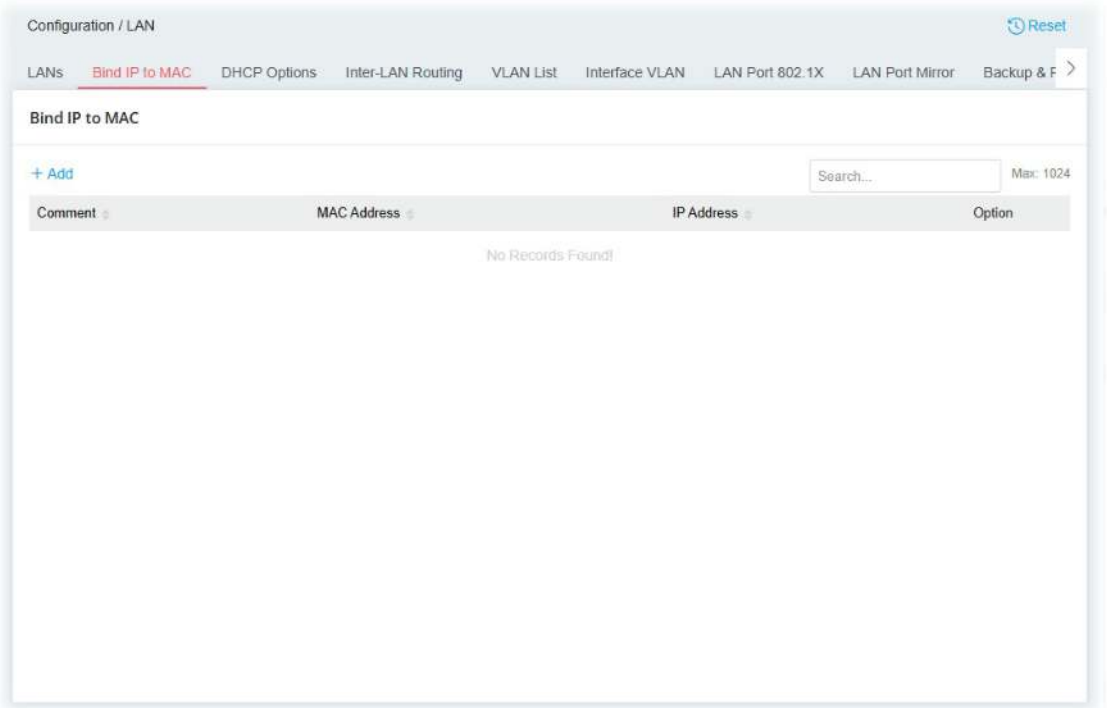
	
DNS Configuration	It is available when Stateless is selected as the IPv6 Assignment. DNS Assign Methods • RA(RDNSS) – The DNS server used for hosts (e.g., PC) will be configured via the Router Advertisement Configuration. • Bit(DHCPv6) – The DNS server used for hosts will be configured via DHCPv6 server. • Manual – Vigor router system will not send DNS sever configuration to the hosts. Primary DNS Address - Enter the IPv6 address for Primary DNS server. Secondary DNS Address - Enter another IPv6 address for DNS server if required.
DHCPv6 Server Configuration	It is available when DHCPv6 (Stateful) is selected as the IPv6 Assignment. On - Enables the built-in DHCPv6 server on the router. • Generate Prefix From – Select the primary WAN interface which is capable to generate the prefix for IPv6 address. Use the drop down list to specify a WAN interface for IPv6. • Auto IPv6 Address Range • Random IPv6 Address Allocation Off - Disables the built-in DHCPv6 server on the router. Relay - When selected, all DHCP requests are forwarded to a DHCP server outside of the LAN subnet, and whose address is specified in the DHCP Server IP Address field. • DHCPv6 Server Interface – Use the drop down list to specify a WAN interface for IPv6. • DHCPv6 Server Address - Enter the IPv6 address of the DHCPv6 server.
DNS Configuration	It is available when DHCPv6 (Stateful) is selected as the IPv6 Assignment. Primary DNS Address - Enter the IPv6 address for Primary DNS server. Secondary DNS Address - Enter another IPv6 address for DNS server if required.
More Settings	
Force DNS Redirection	Enable - Switch the toggle to enable or disable the function. This function allows all outgoing DNS queries to be intercepted and redirected to the router built-in DNS server, improving the domain lookup performance by caching DNS queries and results.

Options under the Advanced Mode	
Router IPv6 Address Table	Enter IPv6 Address and Prefix length to be added, or click an existing IPv6 address to be deleted in the Current IPv6 Address Table below and the values will be automatically copied over. +Add – Click it to add a new entry. Max is 5. Static IP Address – Enter the static IPv6 address for LAN. Prefix Length - Enter the IPv6 prefix length for the IPv6 address.
Unique Local Address Configuration	Unique Local Addresses (ULAs) are private IPv6 addresses assigned to LAN clients. ULA Prefix – LAN clients will be assigned ULAs generated based on the prefix manually entered. • Off – ULA is disabled. • Auto – LAN clients will be assigned ULAs using an automatically-determined prefix. • Manual – Enter an IPv6 address.
Router Advertisement Configuration	The Advanced Settings page has additional settings for Router Advertisement and enabling multiple WANs for IPv6 traffic. RA Priority – Select the default preference value (Low, Medium, and High) of the router sent in route advertisement messages. Min / Max Interval Time – Minimum/ Maximum time, in seconds, between unsolicited multicast route advertisement messages sent by the RA server. Valid Lifetime – Enter one number (unit is second) to specify the valid lifetime for the DHCPv6 server. The device (connected via the LAN interface) is to be used as the default router. This device (connected via the LAN interface) will be treated as the default router within the valid lifetime. Preferred Lifetime – Enter one number (unit is second) to specify the preferred lifetime for the DHCPv6 server. It must be lower or equal to the valid lifetime. This device (Vigor router) will be treated as the default router within the preferred lifetime. When there are multiple routers, priority is necessary. In general, the router within the preferred lifetime has higher priority than the router within the valid lifetime. Hop Limit - The value is required for the device behind the router when IPv6 is in use. Default value of hop limit field in Route Advertisement messages.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

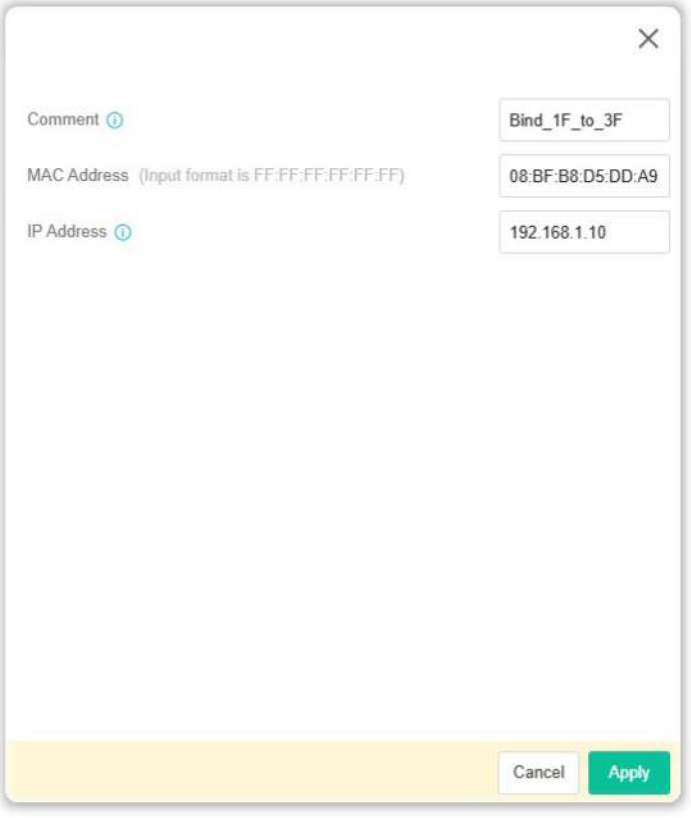
After finishing this web page configuration, please click Apply to save the settings.

II-1-3-2 Bind IP to MAC

This function is used to bind the IP and MAC address in LAN to have a strengthening control in network. With the Bind IP to MAC feature you can reserve LAN IP addresses for LAN clients. Each reserved IP address is associated with a Media Access Control (MAC) address.



To add/edit a profile, click the **+Add/Edit** link to get the following page.

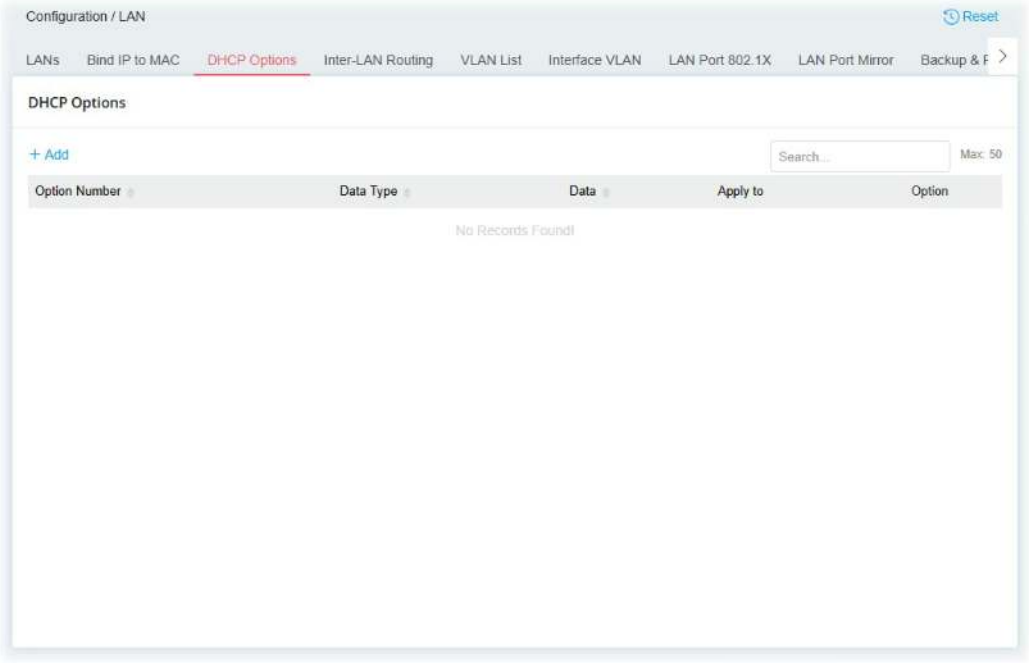


Available settings are explained as follows:

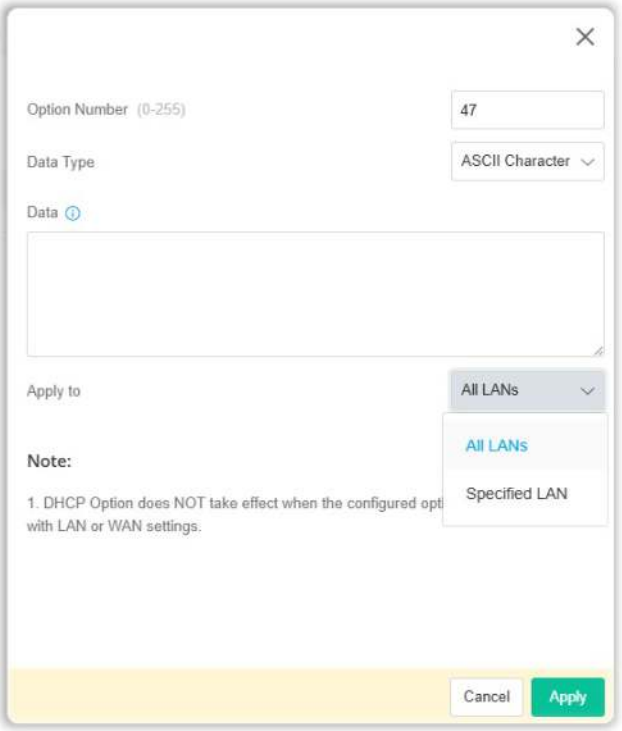
Item	Description
Comments	Enter a brief comment to identify this IP Address - MAC Address pair.
MAC Address	Enter the MAC address of the LAN client's network interface.
IP Address	Enter the IP address to be associated with a MAC address.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-3-3 DHCP Options

DHCP packets can be processed by adding option number and data information when such function is enabled and configured.



To add/edit a profile, click the **+Add/Edit** link to get the following page.

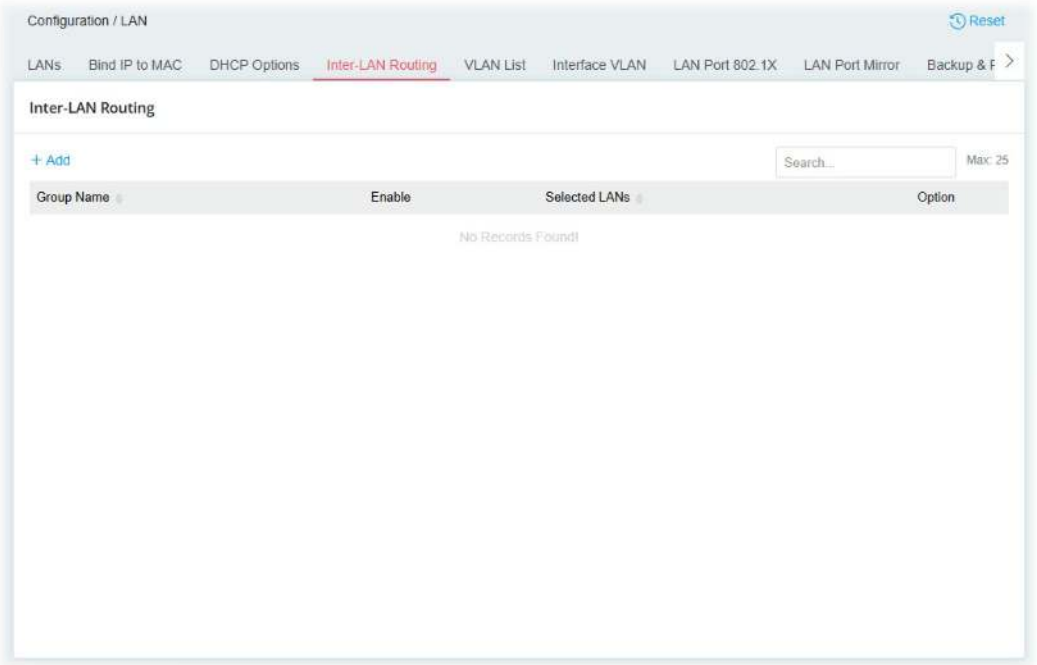


Available settings are explained as follows:

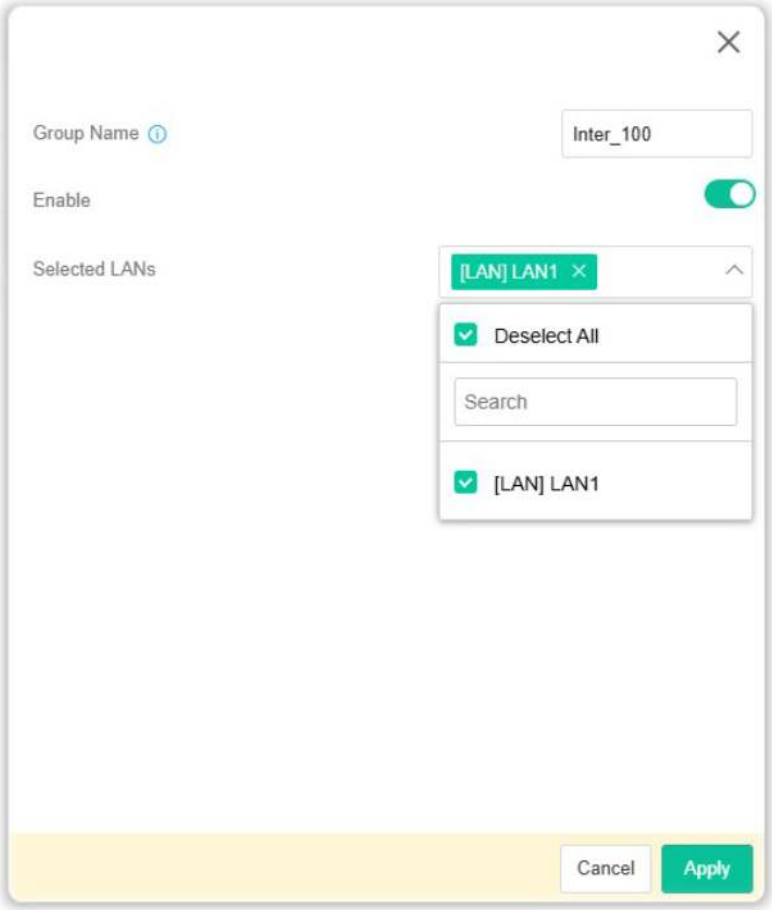
Item	Description
Option Number	Enter a DHCP option number for this function.
Data Type	Choose the type (ASCII or Hex or Address List) for the data to be stored.
Data	Enter the data in the Data field based on the data type selected. ASCII Character - A text string. Example: /path. Hexadecimal Digital - A hexadecimal string. Valid characters are from 0 to 9 and from "a" to "f". Example: 2f70617468. Address List - One or more IPv4 addresses, delimited by commas.
Apply to	Select LAN interface(s) to which this entry is applicable.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-3-4 Inter-LAN Routing

Up to 25 routing profiles provided by the router allow the users to divide groups into different subnets. In addition, different subnets can link for each other by configuring Inter-LAN Routing.



To add/edit a profile, click the **+Add/Edit** link to get the following page.



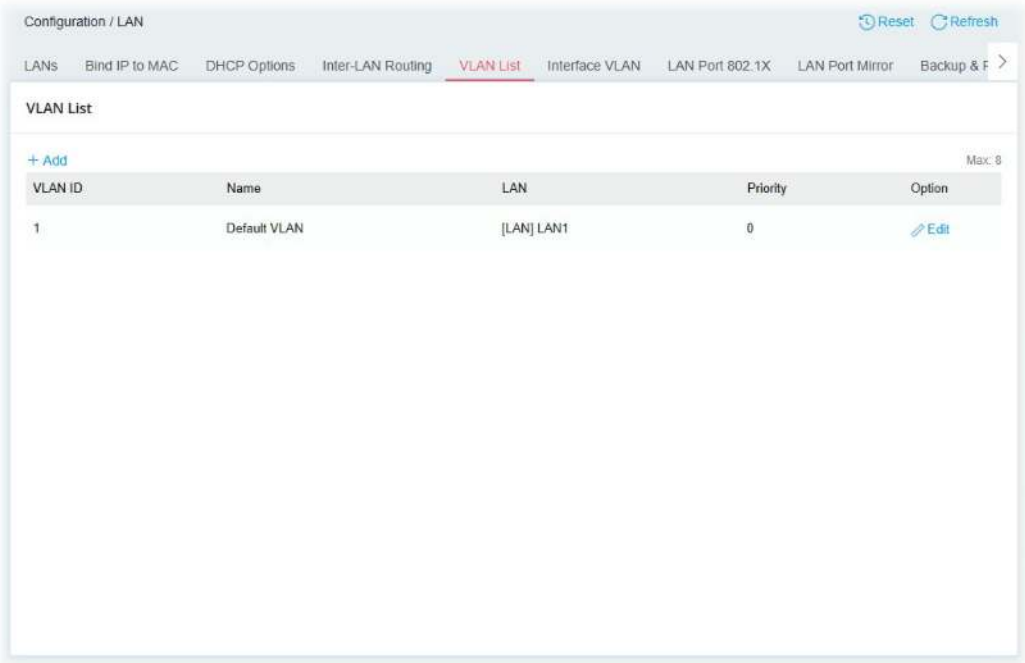
Available settings are explained as follows:

Item	Description
Group Name	Display the name for identification. Change the name if required.
Enable	Switch the toggle to enable the settings.
Selected LANs	Select the box to link two or more different subnets (LAN and LAN).
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

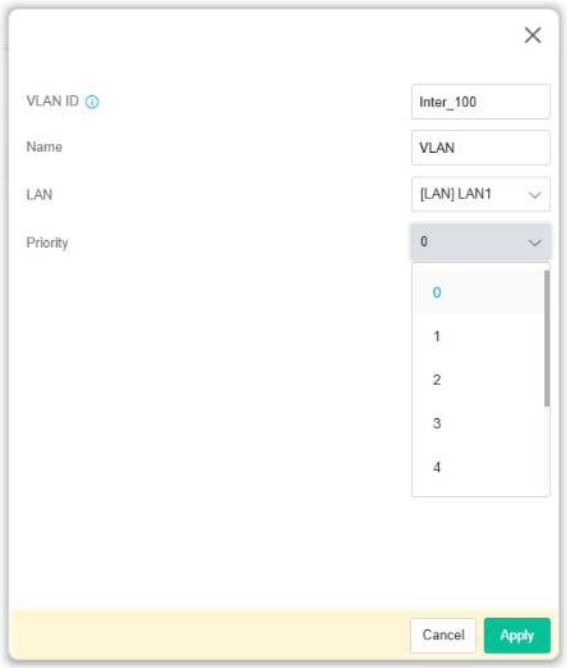
II-1-3-5 VLAN List

Virtual Local Area Networks (VLANs) allow you to subdivide your LAN to facilitate management or to improve network security.

This page allows you to create up to 8 VLAN profiles.



To add/edit a profile, click the **+Add/Edit** link to get the following page.



Available settings are explained as follows:

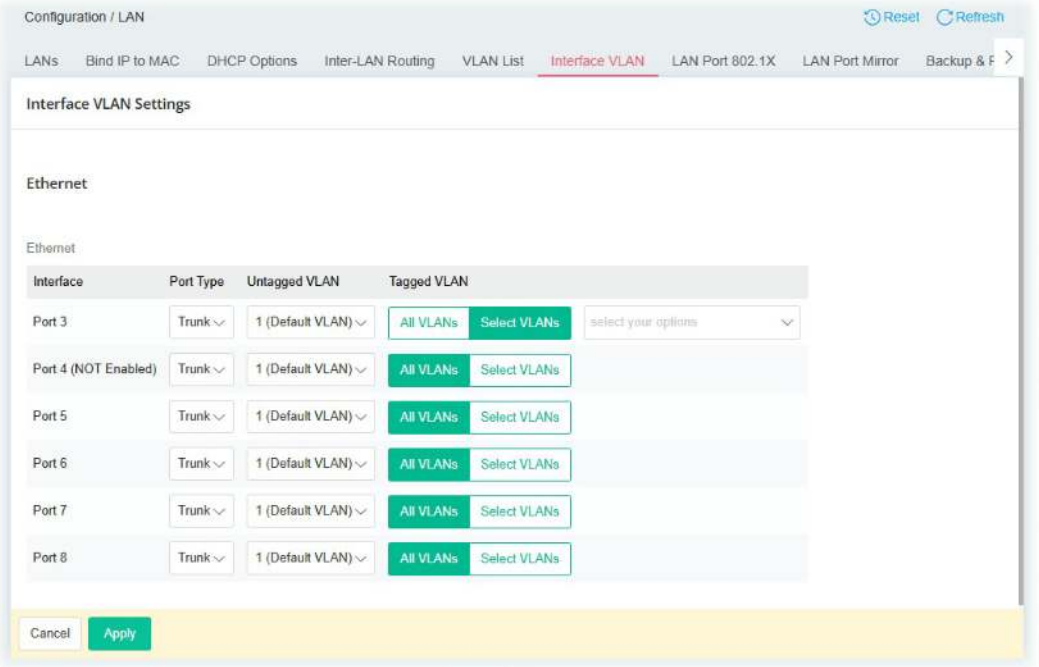
Item	Description
VLAN ID	Enter a number as the VLAN Identifier. Valid values are form 0 to 4095. VIDs must be unique.

Name	Enter a name of the VLAN profile.
LAN	Display the physical LAN subnet on the router. Select the LAN subnet(s) to bind them under the selected VLAN.
Priority	Select the priority of this VLAN profile.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-3-6 Interface VLAN

Port-based VLAN uses physical ports (P1 ~ P4) to separate the clients into different VLAN group.

Virtual LAN function provides you a very convenient way to manage hosts by grouping them based on the physical port. The multi-subnet can let a small businesses have much better isolation for multi-occupancy applications.

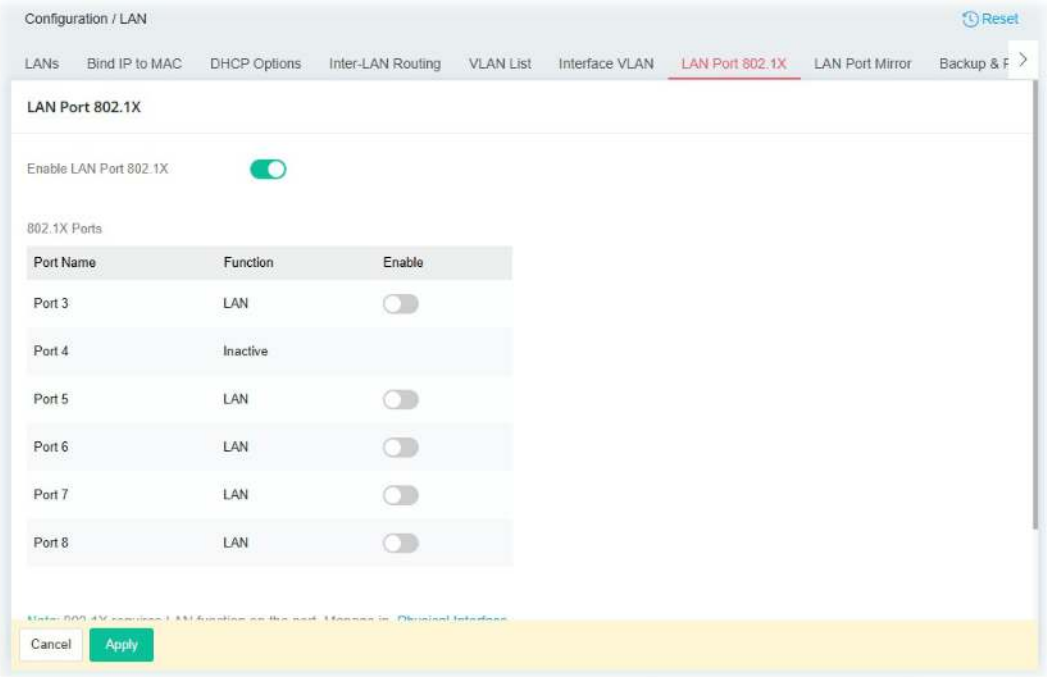


Available settings are explained as follows:

Item	Description
Port Type	Select the VLAN type that the interface (Port 1 to 4) will be applied. **Trunk** – The selected Ethernet port can be used or applied to Multiple VLAN profiles. **Access** – The selected Ethernet port can be used or applied to single VLAN profile.
Untagged VLAN	Select the VLAN profile(s) which will not be tagged. Leave one VLAN untagged at least to prevent from not connecting to Vigor router due to unexpected error.
Tagged VLAN	Enable 802.1Q tagging for the selected VLAN. The router will add specific VLAN number to all packets on the LAN while sending them out. **All VLANs** – All VLAN profiles will be tagged. **Selected VLANs** – Only the selected VLAN profiles will be tagged.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-3-7 LAN Port 802.1x

Wired 802.1X provides authentication for clients wishing to connect to the LAN by Ethernet. Only one client can be authenticated on each LAN port.

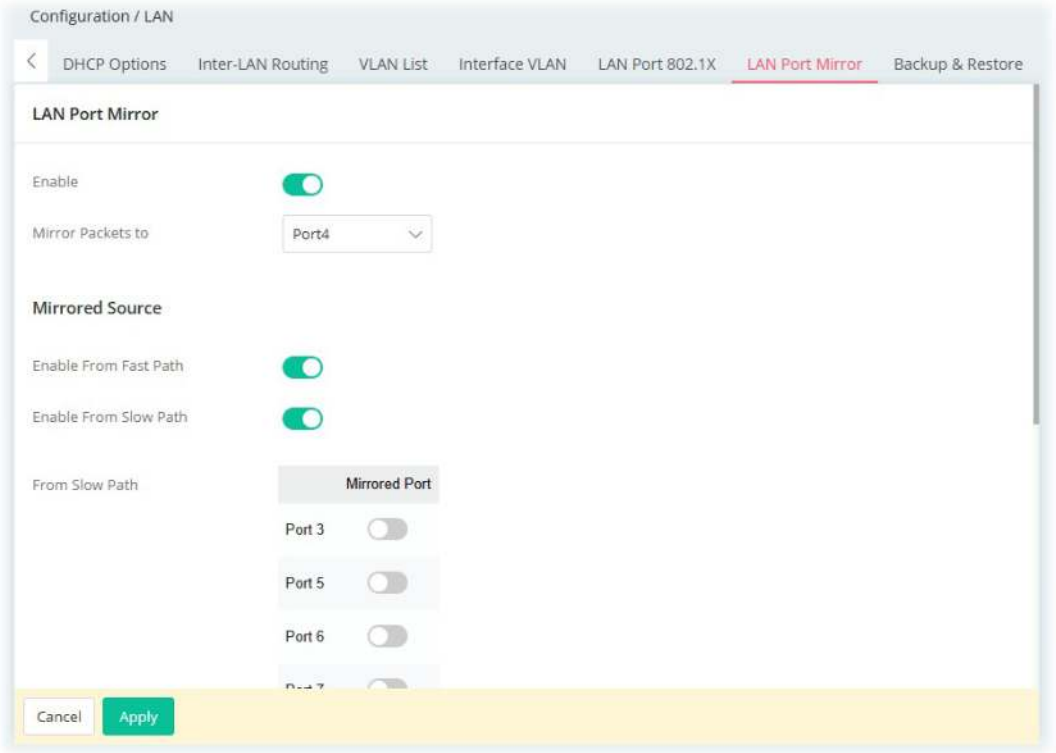


Available settings are explained as follows:

Item	Description
Enabled LAN 802.1X	Switch the toggle to enable or disable LAN 802.1x function.
Port Name	Display the name of the physical LAN port.
Enable	Switch the toggle to enable or disable the function. If enabled, the 802.1X authentication will be available for the selected LAN ports.
External RADIUS Sever Profile	Select one RADIUS server for authenticating the LAN clients.
Cancel	Discard current settings.
Apply	Save the current settings.

II-1-3-8 LAN Port Mirror

The LAN Port Mirror function allows network traffic of select LAN ports to be forwarded to another LAN port for analysis. This is useful for enforcing policies, detecting unauthorized access, monitoring network performance, etc.

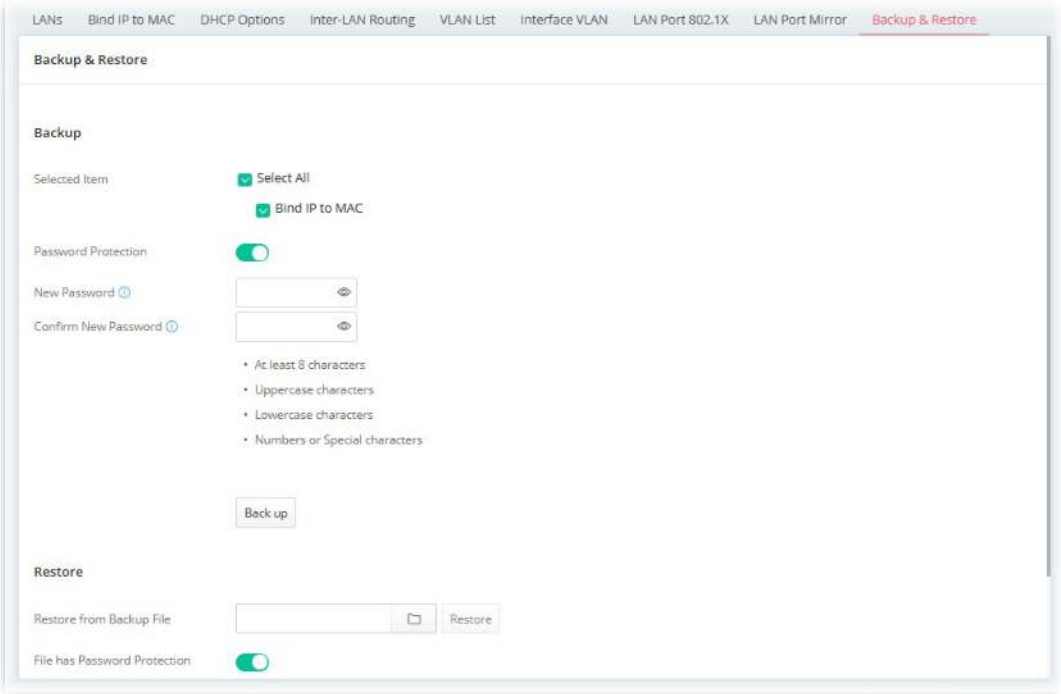


Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable or disable LAN port mirror function.
Mirror Packets to	Specify the mirror port. One and only one port is selected as the mirror port, to which traffic is to be forwarded.
	Mirrored Source
Enable From Fast Path	Switch the toggle to enable or disable the function. If enabled, all transmitted (TX) and received (RX) packets processed by Hardware Accelerator will be copied and sent to the mirror port.
Enable From Slow Path	Switch the toggle to enable or disable the function. If enabled, all transmitted (TX) and received (RX) packets passing through the selected Mirrored Port will be copied and sent to the mirror port.
From Slow Path	Mirrored Port – Switch the toggle to select the interface as the mirrored port.
Cancel	Discard current settings.
Apply	Save the current settings.

II-1-3-9 Backup & Restore

You can save or restore the LAN settings on the router to a file.



Available settings are explained as follows:

Item	Description
	Backup
Selected Item	Select the item to be saved.
Password Protection	Switch the toggle to enable or disable the function. If enabled, set the following items: ● New Password - Enter the password with which you wish to encrypt the certificate. ● Confirm New Password - Enter the password again. Back up - Click to download the certificate.
	Restore
Restore from Backup file	Click to select the backup file you wish to restore. 🗀 - Click to locate the file for restoring. Restore - Click to retrieve the certificate.
File has Password Protection	Switch the toggle to enable or disable the function. If enabled, set the following item: ● Password - Enter the password that was used to encrypt the certificates.

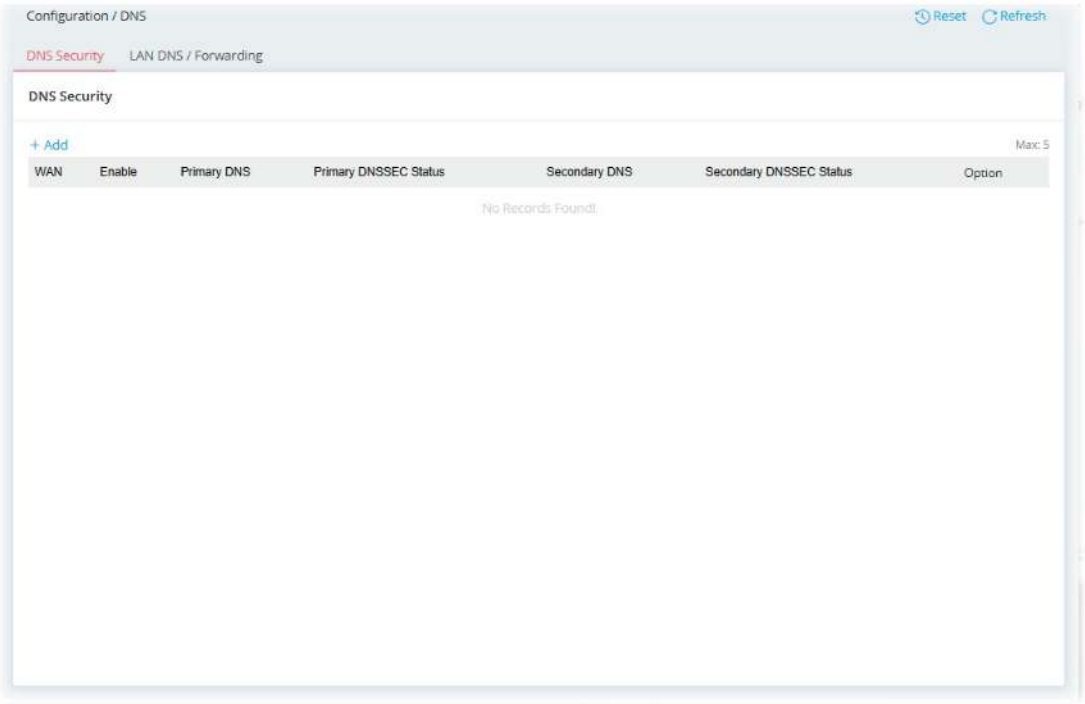
II-1-4 DNS

DNS stands for Domain Name System. Every Internet host must have a unique IP address, also they may have a human-friendly, easy to remember name such as www.yahoo.com. The DNS server converts the user-friendly name into its equivalent IP address.

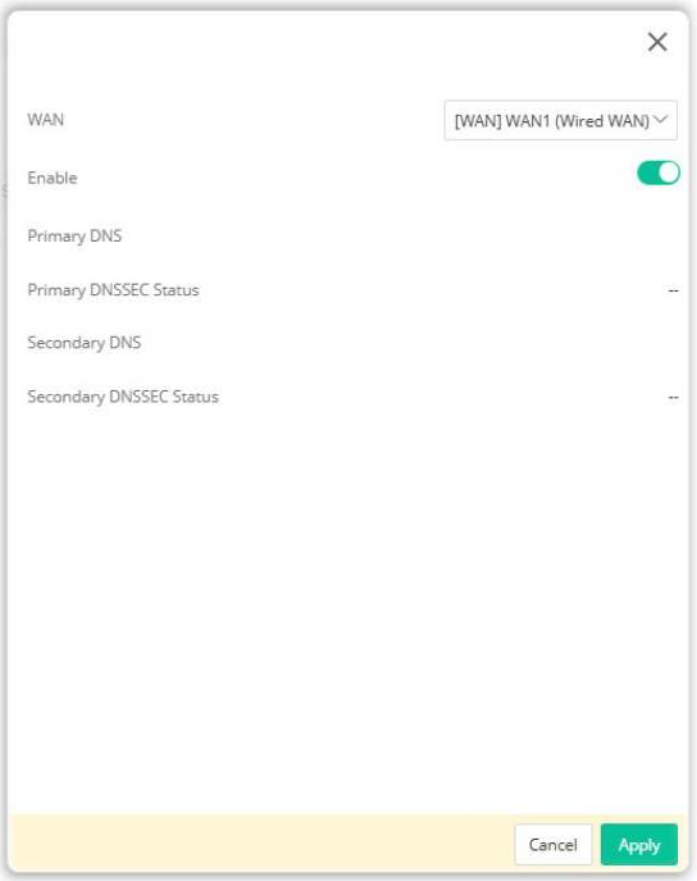
This section offers settings for DNS security and LAN DNS/Forwarding.

II-1-4-1 DNS Security

The DNS servers must support DNS security validation for the feature to function properly.



To add/edit a profile, click the **+Add/Edit** link to get the following page.



Available settings are explained as follows:

Item	Description
WAN	Select the WAN interface for which DNS security is to be configured.
Enable	Switch the toggle to enable or disable DNS security for this WAN Interface. Bogus DNS Reply will be dropped when DNS security enabled.
Primary DNS	Shows the primary DNS server used by this WAN. If "--" appears, it means that no WAN is up or no DNS server is configured.
Primary DNSSE Status	Shows the inspection results if the DNS server supports the DNS security. The result might be: • [Supported] means the DNS server supporting DNS security. • [Unsupported] means the DNS server does not support DNS security, • "--" means the WAN interface is not up or no DNS server detected. • [Check Failed - WAN Issue] means failure to inspect due to no Internet connection. • [DNSSEC Disabled] means the DNS security is disabled. Note: Domain Name System Security Extensions (DNSSEC) protects against DNS-based attacks by authenticating DNS responses from DNS resolvers.
Secondary DNS	Shows the secondary DNS server used by this WAN. If "--" appears, it means that this WAN is not up or no DNS server is

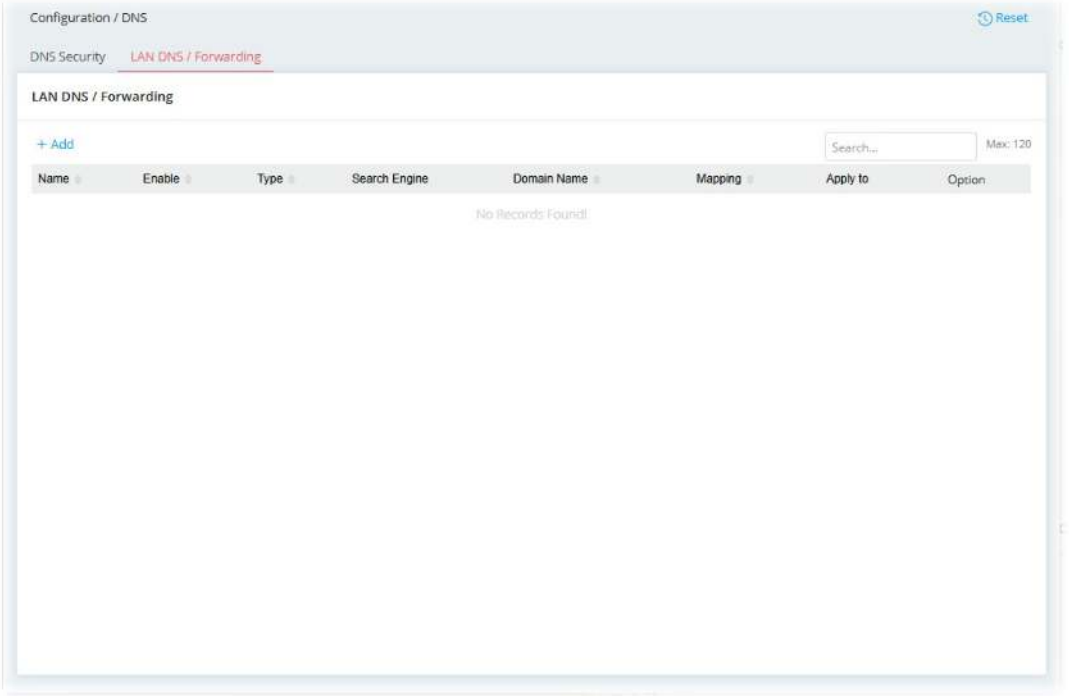
	configured. it means that this WAN is not up or no DNS server is configured.
Secondary DNSSE Status	Shows the inspection results if the DNS server supports the DNS security. The result might be: • [Supported] means the DNS server supporting DNS security. • [Unsupported] means the DNS server does not support DNS security, • "--" means the WAN interface is not up or no DNS server detected. • [Check Failed - WAN Issue] means failure to inspect due to no Internet connection. • [DNSSEC Disabled] means the DNS security is disabled. Note: Domain Name System Security Extensions (DNSSEC) protects against DNS-based attacks by authenticating DNS responses from DNS resolvers.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-4-2 LAN DNS/Forwarding

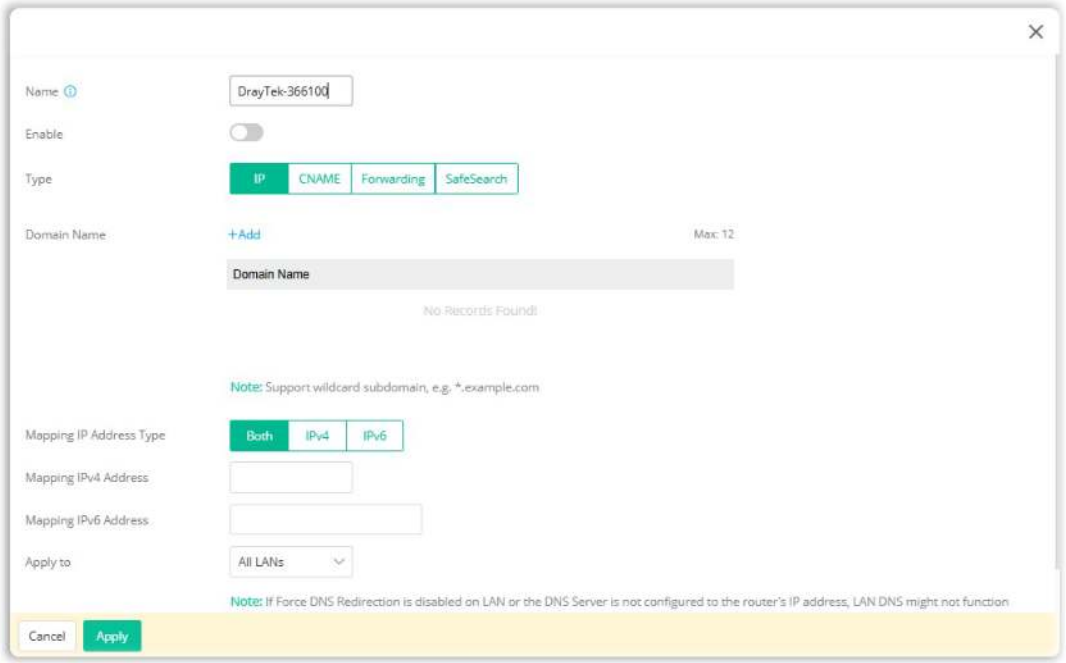
LAN DNS is a simple version of DNS server. LAN DNS allows the network administrator to override standard DNS resolutions for selecting domain addresses. The router will respond to queries on matched domain addresses with custom IP addresses. It is not necessary for the user to build another DNS server in LAN. With such feature, the user can configure some services (such as ftp, www or database) with domain name which is easy to be accessed.

DNS Forwarding allows the network administrator to forward DNS queries to different DNS servers based on the domain name.

LAN DNS and DNS Forwarding only affect DNS queries that are sent to the WAN through the router. DNS queries that are directed to a DNS server on the LAN will not be intercepted by the router.



To add/edit a profile (up to 120), click the **+Add/Edit** link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter a string as the profile name.
Enable	Switch the toggle to enable/disable this profile.
Type	Select IP, CNAME,, Forwarding or SafeSearch.
Domain Name	+Add – Enter the domain name for the router to look for in DNS queries to intercept and reply to. Wildcards in the form of asterisks (*) can be used to match a domain level. For example, *.draytek.com will match domain names such as www.draytek.com and ftp.draytek.com. Up to 12 domain names can be created.
If IP is selected as the Type	The IP address listed here will be used for mapping with the domain name specified above. Mapping IP Address Type – Select Both, IPv4, or IPv6. Mapping IPv4 Address – If Both/IPv4 is selected, enter an IPv4 address in this field. Mapping IPv6 Address – If Both/IPv6 is selected, enter an IPv6 address in this field. Apply to – Select all LANs or specified LAN interfaces for applying this DNS server profile.
If CNAME is selected as the Type	CNAME – Enter a domain name alias for the domain name. Apply to - Select all LANs or specified LAN interfaces for applying this DNS server profile.
If Forwarding is selected as the Type	DNS Server Type – Both, IPv4, IPv6 Primary IPv4 DNS Server – Enter the primary IPv4 address of the DNS server you want to use for DNS forwarding. Secondary IPv4 DNS Server – Enter the secondary IPv4 address of the DNS server you want to use for DNS forwarding. Primary IPv6 DNS Server –Enter the primary IPv6 address of the DNS server you want to use for DNS forwarding.

	Secondary IPv6 DNS Server – Enter the secondary IPv6 address of the DNS server you want to use for DNS forwarding. Apply to - Select all LANs or specified LAN interfaces for applying this DNS server profile.
If SafeSearch is selected as the Type	Some search engines, such as Bing, Google, and Yandex, can enforce security measures to filter out pornographic and potentially offensive content. These engines are classified as SafeSearch type. Search Engine – Select one or more of the commonly used search engines. Apply to - Select all LANs or specified LAN interfaces for applying this DNS server profile.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-5 Routing

Through the IP address and interface configuration, a route policy can be used to configure any routing rules to fit actual requests.

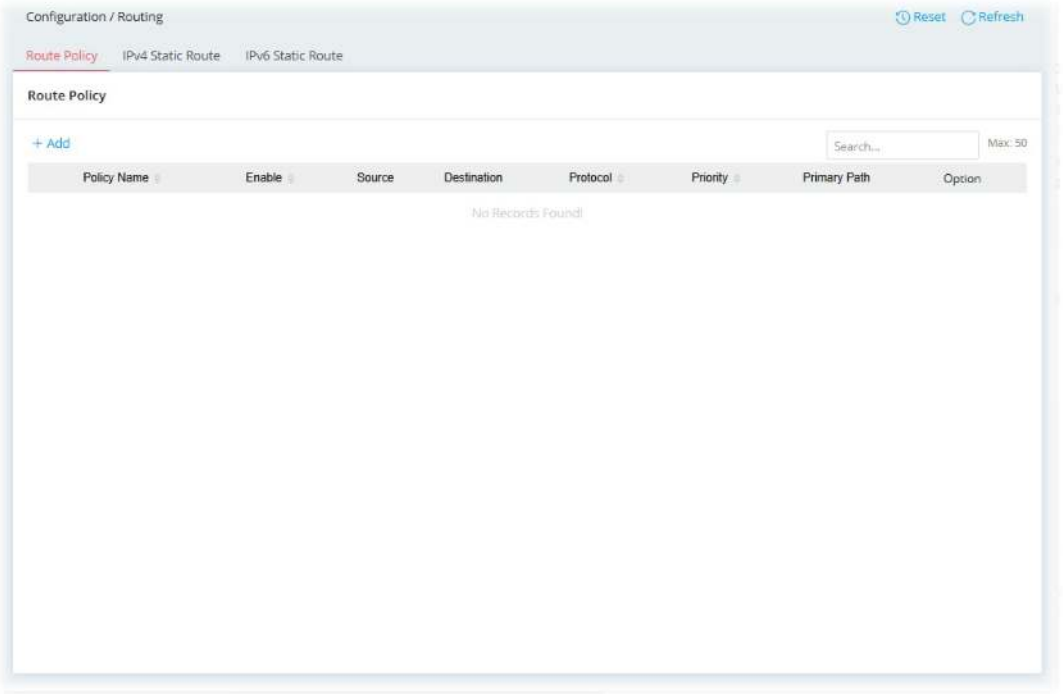
The packets will be directed to the specified interface if they match one of the routing policies.

The router offers IPv4 and IPv6 for you to configure the static route. Both protocols bring different web pages.

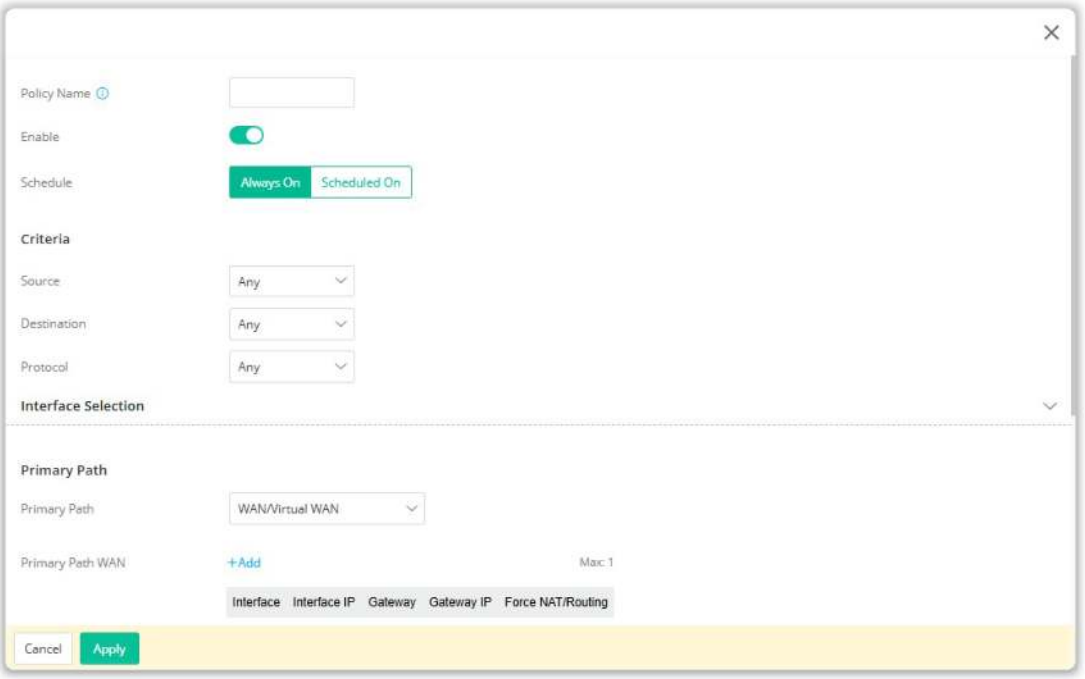
II-1-5-1 Route Policy

Route Policy (also well known as PBR, policy-based routing) is a feature where you may need to get a strategy for routing. The packets will be directed to the specified interface if they match one of the policies. You can setup route policies in various reasons such as load balance, security, routing decision, and etc.

Through protocol, IP address, port number and interface configuration, Route Policy can be used to configure any routing rules to fit actual request.



To add a new IPv4 route policy, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Policy Name	Enter a name as the routing profile name.
Enable	Switch the toggle to enable/disable the profile.
Schedule	Determine the valid time for the routing profile. **Always On** – The routing profile will be valid all the time if it is enabled. **Scheduled On** – The routing profile will be valid based on the time schedule specified here.
Criteria	
Source / Destination	Select the type of IP addresses to which this rule is to be applied. • **Any** - This policy applies to all source/destination IP addresses. • **IPv4 Address** - This policy applies to the specified range of source IP addresses. • **IPv4 Subnet** - This policy applies to source IP addresses defined by the specified network IP address and subnet mask. • **IP Object** - This policy applies to a preconfigured IP object. • **IP Group** - This policy applies to a preconfigured IP group.
Source / Destination IPv4 Address	It is available when **Source / Destination** is set as **IPv4 Address**. **+Add** – Click to have new entries for setting IPv4 Address Start and End. **IPv4 Address Start / End** – Enter two IPv4 address(s), one for start and one for end. **Delete** – Click to remove current entries.
Source / Destination IPv4 Subnet Address	It is available when **Source / Destination** is set as **IPv4 Subnet**. **+Add** – Click to have new entries for setting IPv4 subnet. **IPv4 Address** – Enter an IP address. **Subnet Mask** - Use the drop down list to choose a suitable mask

	for the network.
Source / Destination IP Object	It is available when Source / Destination is set as IP Object. +Add – Click it to create a new object (containing different IP addresses). Up to 12 objects can be created. Select Object – Check to select an object or objects.
Source / Destination IP Group	It is available when Source / Destination is set as IP Group. +Add –Click it to create a new group (containing different IP objects). Up to 12 groups can be specified here. Select Group - Check to select a group or groups.
Protocol	Choose a proper protocol for the WAN interface. Any – Any kind of protocol will be used for the WAN interface. Service Object – The protocol used will be determined by the service object. • Service Type Object – Click +Add to create a new object (containing different protocols). Up to 12 objects can be created. TCP/UDP – Select TCP/UDP for the WAN interface. • Specify Source Port – Switch the toggle to enable the setting of Source Port. • Source Port / Destination Port – Set the range (1 to 65535). TCP – Same as TCP/UDP. UDP – Same as TCP/UDP. ICMP – Select ICMP for the WAN interface.
	Interface Selection
Primary Path	Specify the interface that the traffic described by this rule is to be directed. If the packet traffic is matched with the criteria set above, it will be sent to the designated interface and gateway. Primary Path – Packets will be transferred to the interface chosen here. Select an interface from the list (WAN/LAN: A WAN or LAN interface; VPN: A Virtual Private Network).  Primary Path WAN – It is available when the WAN/Virtual WAN is selected. +Add – Click +Add to create the primary path. Select WAN interface and the corresponding IP address. Packets match with the criteria will be transferred to the interface chosen here. Select an interface from the list. Specify the gateway (using the default device or customized a gateway IP). Then determine which mechanism (Force NAT/Routing) that the router will use to forward the packet to WAN. Primary Path VPN - It is available when the VPN is selected. +Add – Click +Add to create a new VPN path. Use the drop-down

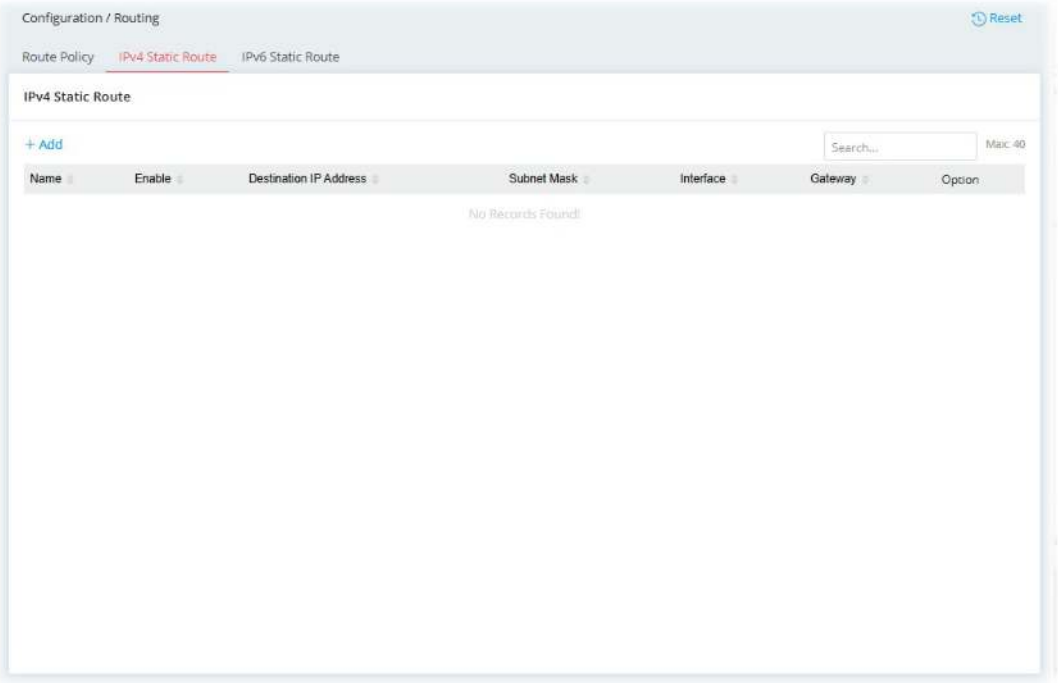
	list to select a VPN profile. Primary Path LAN - It is available when the LAN is selected. +Add – Click +Add to create a new VPN path. Use the drop-down list to select a VPN profile.
Secondary Path	Disabled – Disable the function settings for the secondary path.  Secondary Path WAN – It is available when the WAN/Virtual WAN is set for Secondary Path. +Add – Click +Add to create the secondary path by specifying WAN settings. Secondary Path VPN - It is available when the VPN is set for Secondary Path. +Add – Click +Add to create a new VPN path. Secondary Path LAN - It is available when the LAN is set for Secondary Path. +Add – Click +Add to create a new LAN path.
Last Resort Path	The last resort path (setting) will be adopted instead once the Primary Path or the Secondary Path could not be used for directing the traffic. Disabled –Disable the function settings for the Last Resort Path.  Any packet matching with the rule (source/destination/protocol) specified in Criteria above, will be forwarded to the interface defined on Last Resort Path. Default WAN – The default WAN interface will be used for the last resort path. • Gateway – Select Default or Customize. • Gateway IP Address – Enter the IP address of the gateway if Customize is selected. • Force NAT/Routing – Determine which mechanism (Force NAT/Routing) that the router will use to forward the packet to WAN. WAN/Virtual WAN – Specify a WAN interface or a virtual WAN interface for the last resort path. • Last Resort Path WAN – Click +Add. Then select a WAN

	interface, the IP address (WAN), the gateway IP address(LAN) and the packet forwarding mechanism. VPN –Specify a VPN profile for the last resort path. • Last Resort Path VPN – Click +Add. Select one of the VPN profiles. LAN – Specify a LAN interface for the last resort path. • Last Resort Path LAN – Click +Add. Then select a LAN interface with an IP address (gateway) and the packet forwarding mechanism.
More settings	
Enable Syslog	Switch the toggle to enable/disable the function of saving corresponding log to Syslog.
Priority	Specifies the priority of the rule about other rules. Normal – The routing profile does not affect other routes on the routing table. High – The routing profile will override the VPN routes only. However, it will not affect LAN/Static route. Top – The routing profile will override VPN and LAN/Static route.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

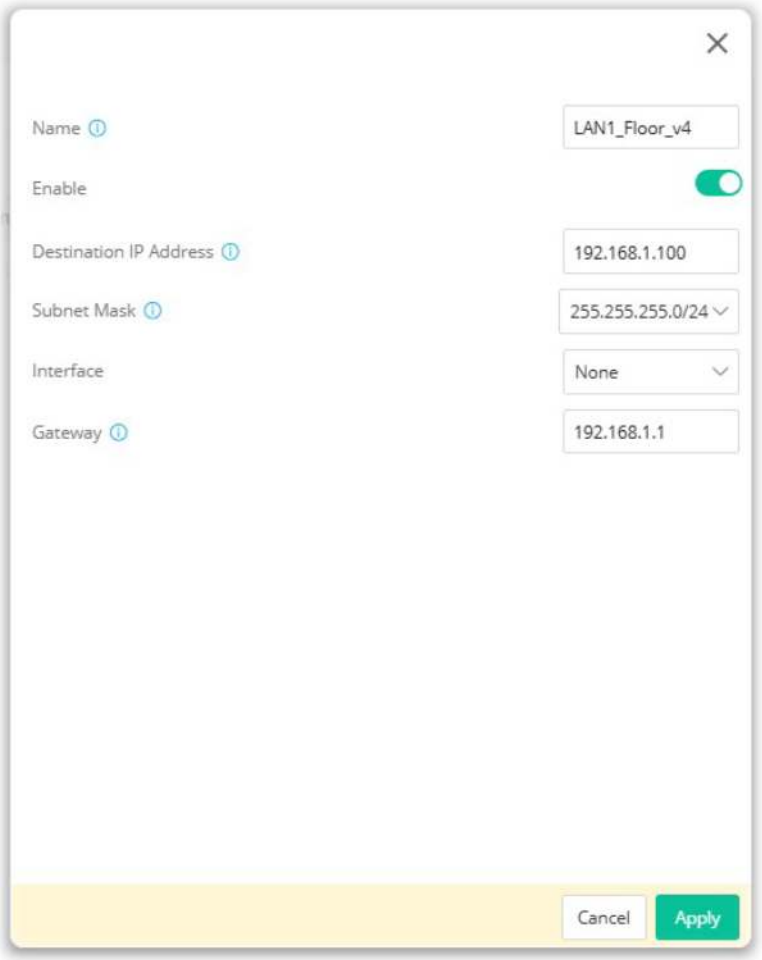
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-5-2 IPv4 Static Route

Static routing is an alternative to dynamic routing. It is a process that the system network administrator can configure network routers with all the required information for packet forwarding.



To add a new IPv4 static route, click the **+Add** link to get the following page.



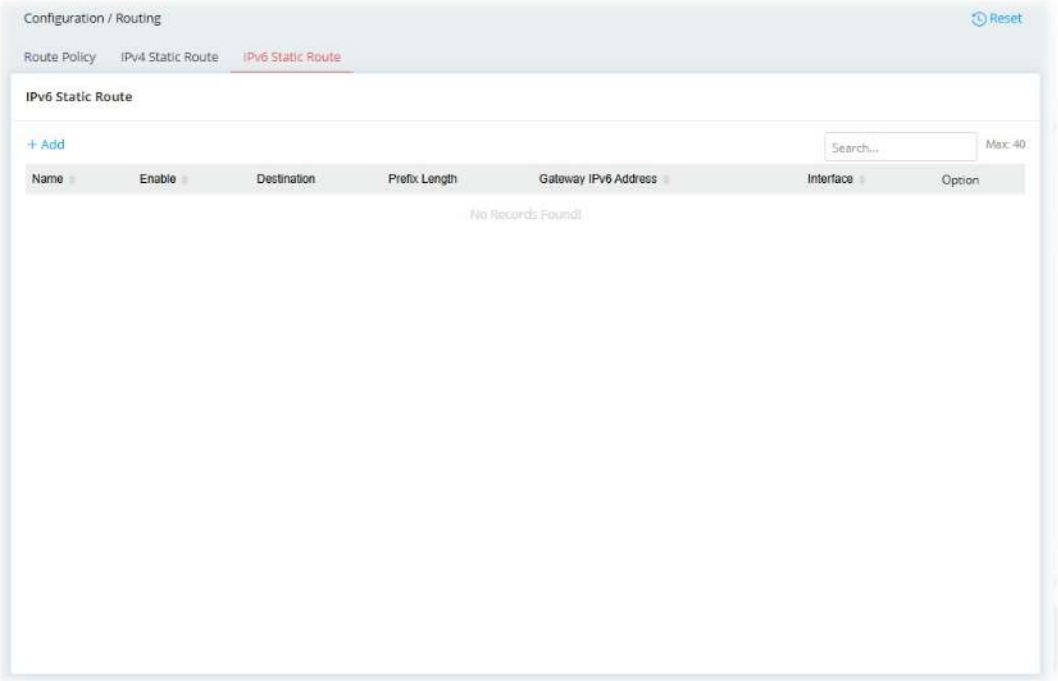
Available settings are explained as follows:

Item	Description
Name	Enter a name as the profile name.
Enable	Switch the toggle to enable or disable the function.
Destination IP Address	Enter the IP address as the destination IP address.
Subnet Mask	Select a subnet mask of this static route.
Interface	Use the drop-down list to specify an interface for this static route.
Gateway	Enter an IP address as the gateway.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

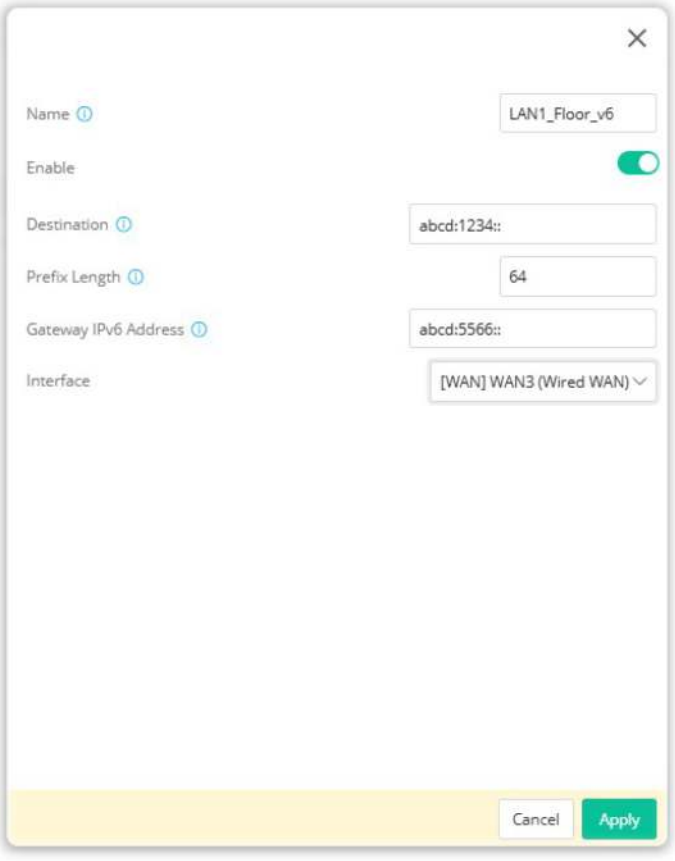
After finishing this web page configuration, please click Apply to save the settings.

II-1-5-3 IPv6 Static Route

Static routing is an alternative to dynamic routing. It is a process that the system network administrator can configure network routers with all the required information for packet forwarding.



To add a new IPv6 static route, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter a name as the profile name.
Enable	Switch the toggle to enable or disable the function.
Destination	Enter the IPv6 address as the destination IP address.
Prefix Length	Enter the fixed value for prefix length.
Gateway IPv6 Address	Enter an IPv6 address as the gateway.
Interface	Use the drop-down list to specify an interface for this static route.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

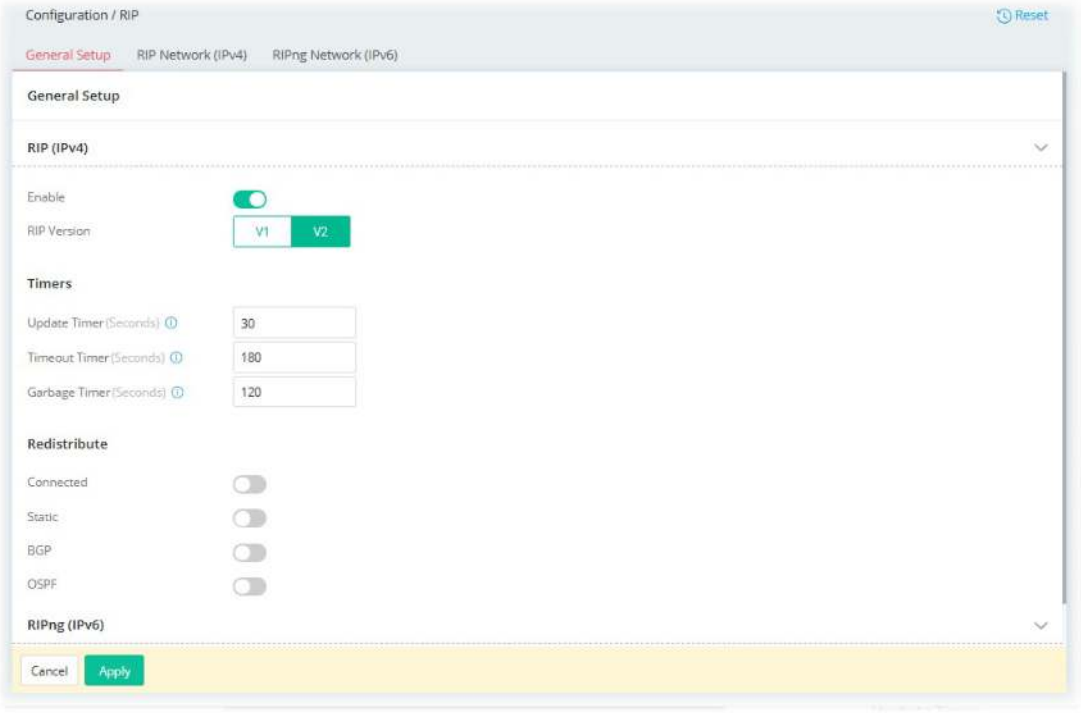
II-1-6 RIP

The Routing Information Protocol (RIP) and the RIPng (RIP next generation) are the most popular interior routing protocols. The difference is that the RIPng (RIP next generation) is based on the IPv6 address, but offers the same functions and benefits as IPv4 RIP v2.

If enabling the RIP feature, the router will attempt to exchange routing information with neighboring routers using the Routing Information Protocol.

II-1-6-1 General Setup

There are two versions of RIP available. This page offers comprehensive settings for each of these versions.



Available settings are explained as follows:

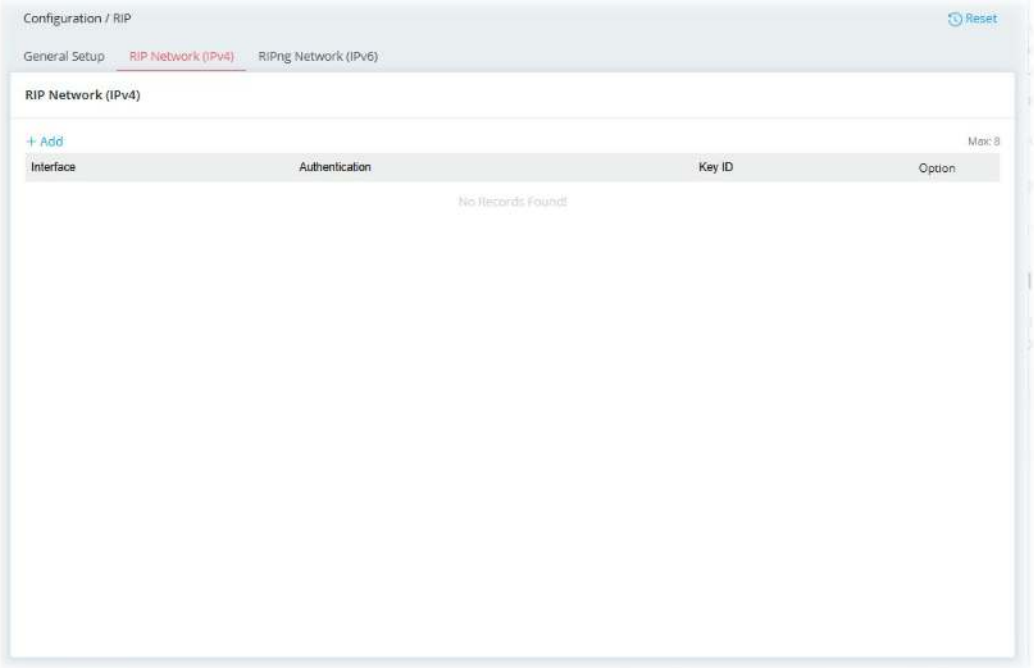
Item	Description
General Setup - RIP	
Enable	When Enabled, the router will attempt to exchange routing information with neighbouring routers using the Routing Information Protocol.
RIP Version	Specify the version number (V1/V2) for RIP protocol.
Update Timer	Enter a value as the update timer. When the time is up, the Vigor router will send a message containing the complete routing table to all neighboring routers for exchanging the routing information.
Timeout Timer	The routing information will be valid (but not removed) till the time expiration set in this field. The information will be kept in the routing table temporarily. At the same time, the neighbors will be notified that the route has been dropped.
Garbage Timer	The route will be removed from the routing table upon the expiration set in Garbage Timer.
Connected	Switch the toggle to enable/disable the function. All Networks – Apply the RIP profile to all the LAN interfaces. Exclude NAT Networks - Apply the RIP profile to all the LAN interfaces except for NAT network.
Static	Switch the toggle to enable (apply the static route to the RIP profile) or disable the function.
BGP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the BGP protocol) or disable the function.
OSPF	Switch the toggle to enable (allow dynamically route traffic based on information learned from the OSPF protocol) or disable the function.
RIPng(Ipv6)	
Enable	Switch the toggle to enable/disable the function of Routing Information Protocol next generation (RIPng).
Update Timer	Enter a value as the update timer. When the time is up, the Vigor router will send a message containing the complete routing table to all neighboring routers for exchanging the routing information.
Timeout Timer	The routing information will be valid (but not removed) till the time expiration set in this field. The information will be kept in the routing table temporarily. At the same time, the neighbors will be notified that the route has been dropped.
Garbage Timer	The route will be removed from the routing table upon the expiration set in Garbage Timer.
Connected	Switch the toggle to enable (apply the RIPng settings to all the LAN interfaces) or disable the function.

Static	Switch the toggle to enable (apply the static route to the RIP profile) or disable the function.
BGP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the BGP protocol) or disable the function.
OSPF	Switch the toggle to enable (allow dynamically route traffic based on information learned from the OSPF protocol) or disable the function.
Cancel	Discard current settings.
Apply	Save the current settings.

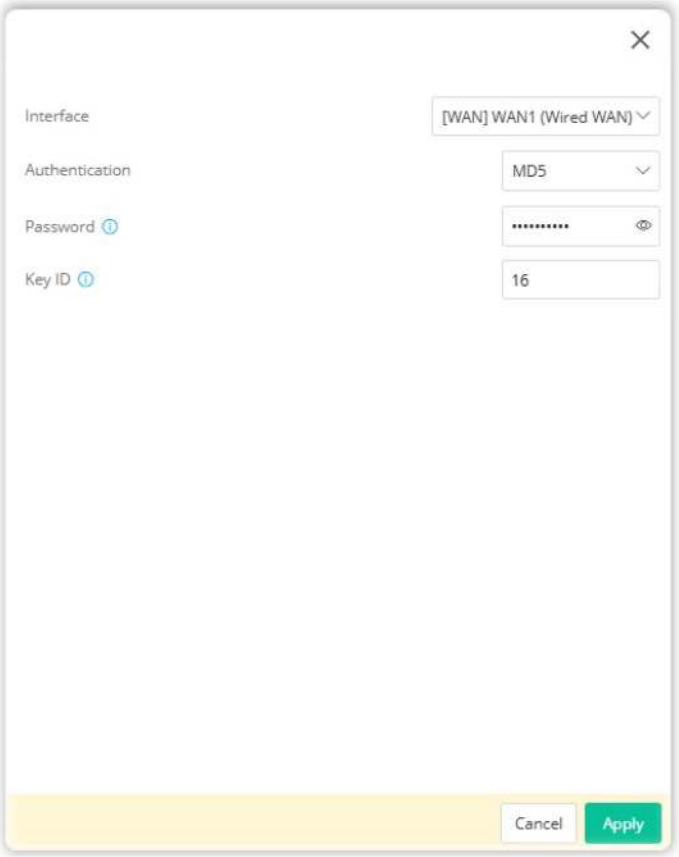
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-6-2 RIP Network(IPv4)

This page allows you to configure up to eight neighboring routers for exchanging the routing information with the local router (Vigor2928).



To add a new RIP network profile, click the **+Add** link to get the following page.



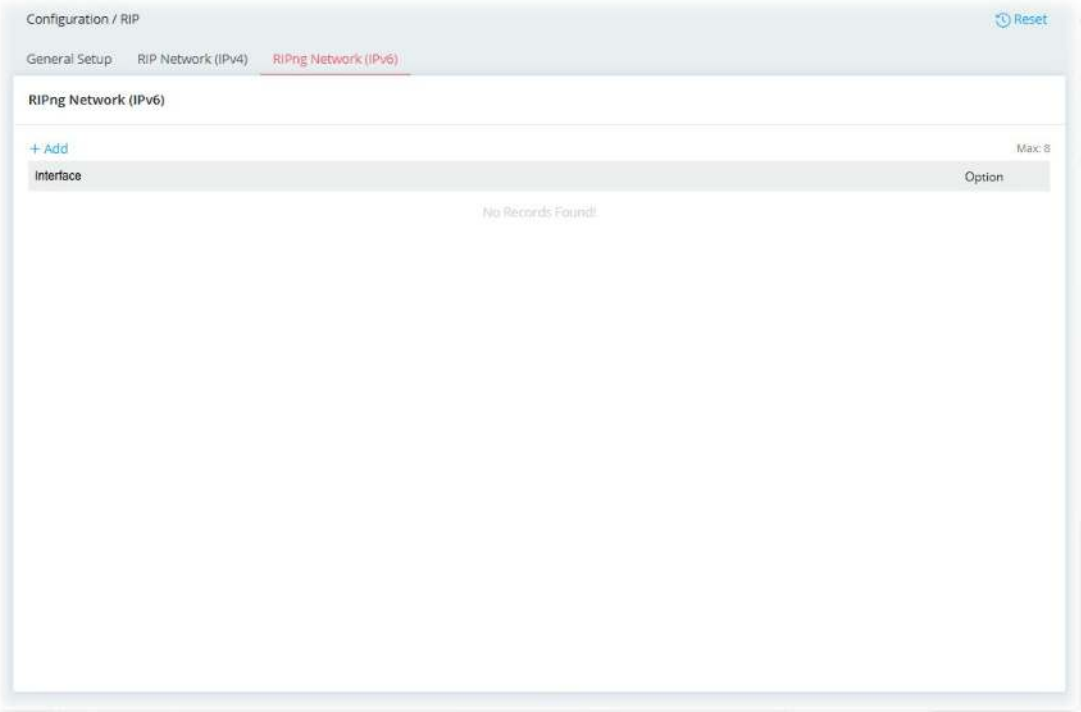
Available settings are explained as follows:

Item	Description
Interface	Select a LAN / WAN interface to apply the settings configured for this profile.
Authentication	Select the authentication mechanism for this profile. Disabled – No authentication mechanism will be used. Plain-Text – Only password will be used for authentication. • Password –Enter characters as the password for MD5 authentication. MD5 – Use MD5 authentication. • Password – Enter characters as the password for MD5 authentication. • Key ID – Enter a number (0~255). The ID will help Vigor router to be identified in an autonomous system.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-6-3 RIPng Network(IPv6)

This page allows you to configure up to eight interfaces (WAN or LAN) for exchanging the routing information with the local router (Vigor2928) based on IPv6 address(es).



To add a new RIPng network profile, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Interface	Select a LAN / WAN interface to apply the settings configured for this profile.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

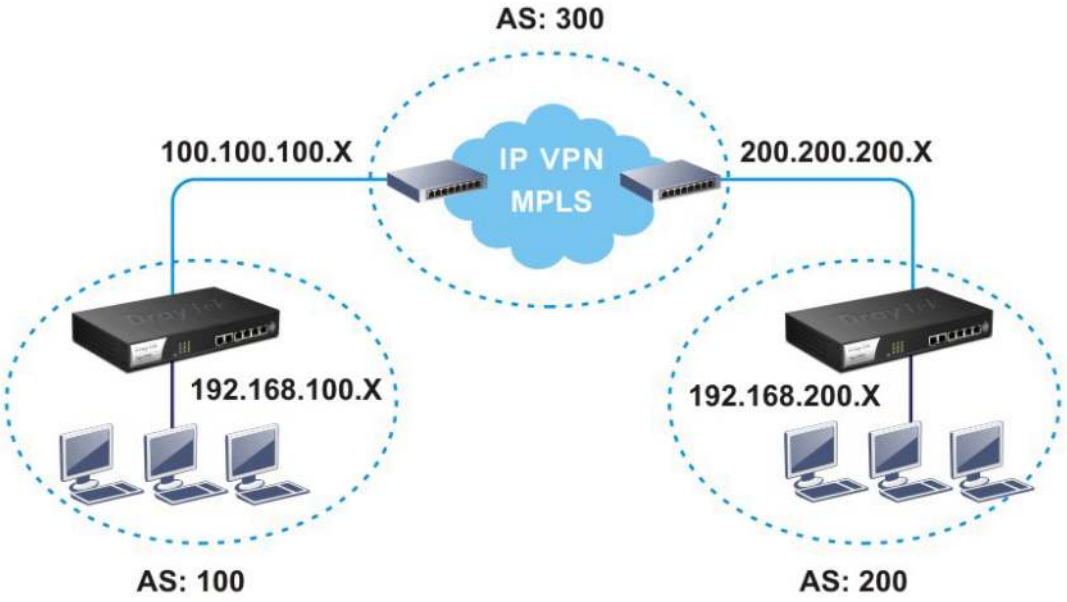
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-7 BGP

Border Gateway Protocol (BGP) is a standardized protocol designed to exchange routing and reachability information among autonomous systems (AS) on the Internet.

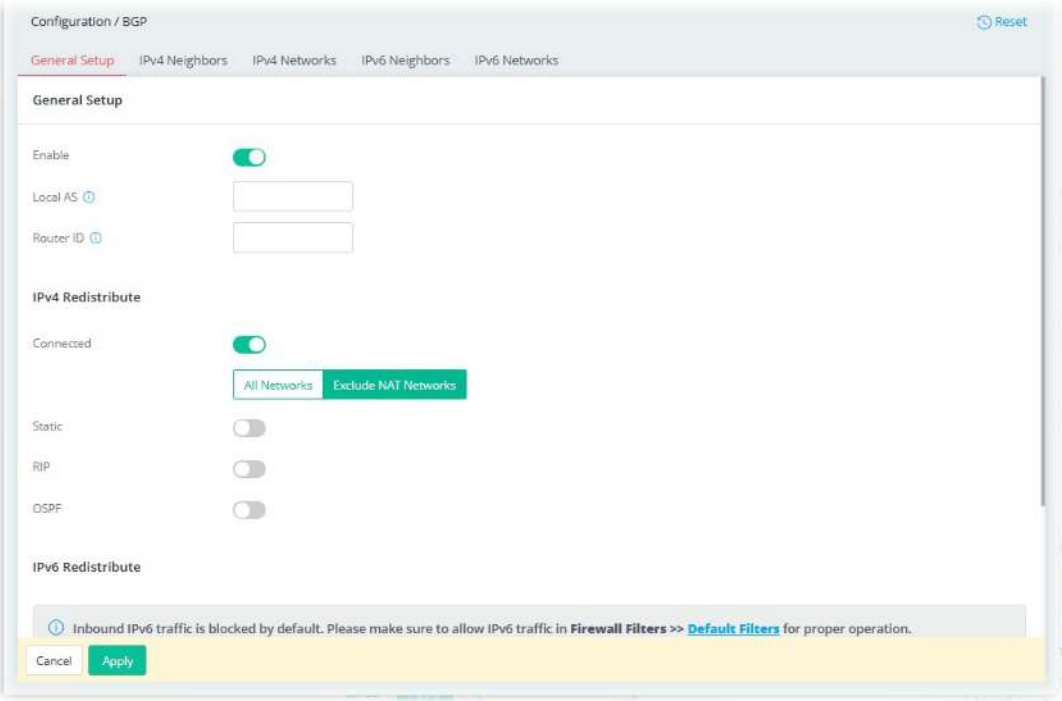
The protocol TCP is used by two routers supporting BGP for data transmission. They can exchange the BGP routing information for each other. A BGP router is the "neighbor" of other BGP routers. Define the IPv4/IPv6 address, AS number for the router is essential for TCP connection of BGP routing information exchange.

AS, the abbreviation of Autonomous System, is a group interconnected with multiple IPv4/IPv6 addresses. Each AS shall be assigned with one AS number (ASN). The ASN is a unique identifier for AS to distinguish each network group in the whole interconnected network. It can be operated by one or several ISPs and follows the routing policies made by ISP.



II-1-7-1 General Setup

Set general settings for for local router and neighboring routers.



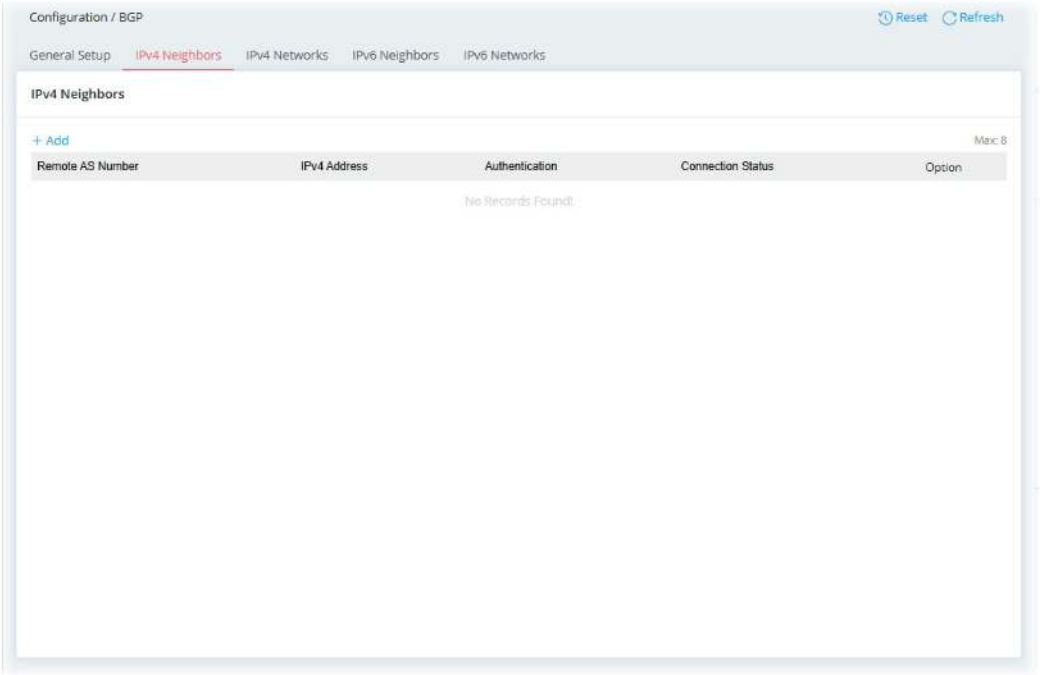
Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable/disable the basic BGP function for local router.
Local AS	Set the AS number for local router.
Router ID	Specify the LAN subnet for the router.
	IPv4 Redistribute
Connected	All Networks – Apply the BGP profile to all the LAN interfaces. Exclude NAT Networks - Apply the BGP profile to all the LAN interfaces except for NAT network.
Static	Switch the toggle to enable or disable the function (apply the static route to the BGP profile).
RIP	Switch the toggle to enable or disable the function (apply the RIP function to the BGP profile).
OSPF	Switch the toggle to enable or disable the function (apply the OSPF function to the BGP profile).
	IPv6 Redistribute
Connected	Switch the toggle to enable (apply the BGP profile to all the LAN interfaces) or disable the function.
Static	Switch the toggle to enable or disable the function (apply the static route to the BGP profile).
RIP	Switch the toggle to enable or disable the function (allow dynamically route traffic based on information learned from the RIP protocol).
OSPF	Switch the toggle to enable or disable the function (allow dynamically route traffic based on information learned from the OSPF protocol).
Cancel	Discard current settings and return to the previous page.

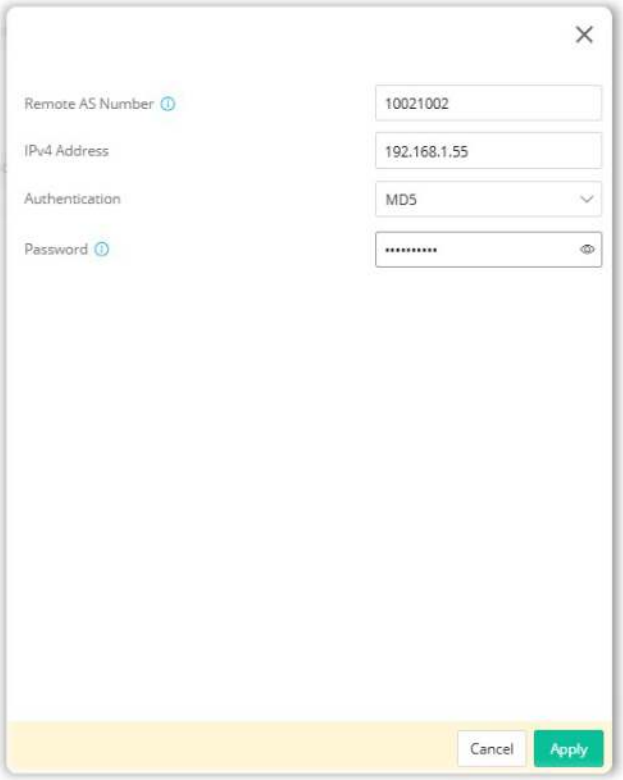
Apply	Save the current settings and exit the page.

II-1-7-2 IPv4 Neighbors

Set general settings for the neighboring routers (based on IPv4 address).



To add a new IPv4 neighbors profile (up to 8), click the **+Add** link to get the following page.



Available settings are explained as follows:

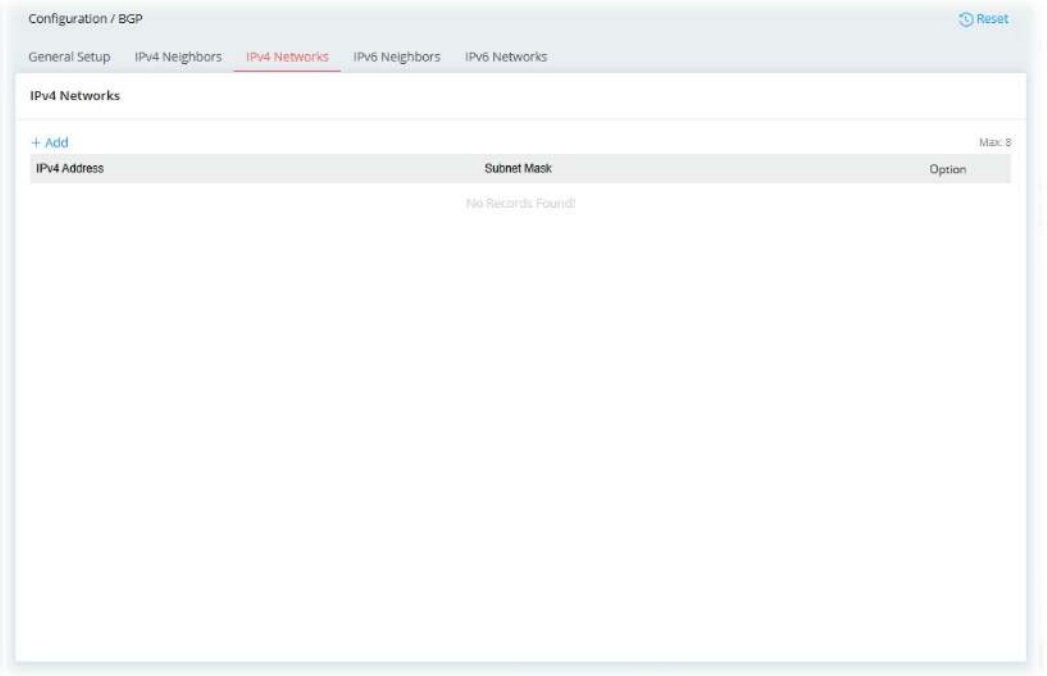
Item	Description

Remote AS Number	Specify the AS Number for neighboring router.
IPv4 Address	Enter the IP address specified for the neighboring profile.
Authentication	Select the authentication mechanism for this profile. Disabled – No authentication mechanism will be used. MD5 – Use MD5 authentication. • Password – Enter characters as the password for MD5 authentication.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-7-3 IPv4 Networks

This page allows you to configure up to eight neighboring networks for exchanging the routing information with the local router (Vigor2928). The IP address defined on this page will be used to declare which network will participate in the RIP protocol.



To add a new IPv4 networks profile (up to 8), click the **+Add** link to get the following page.



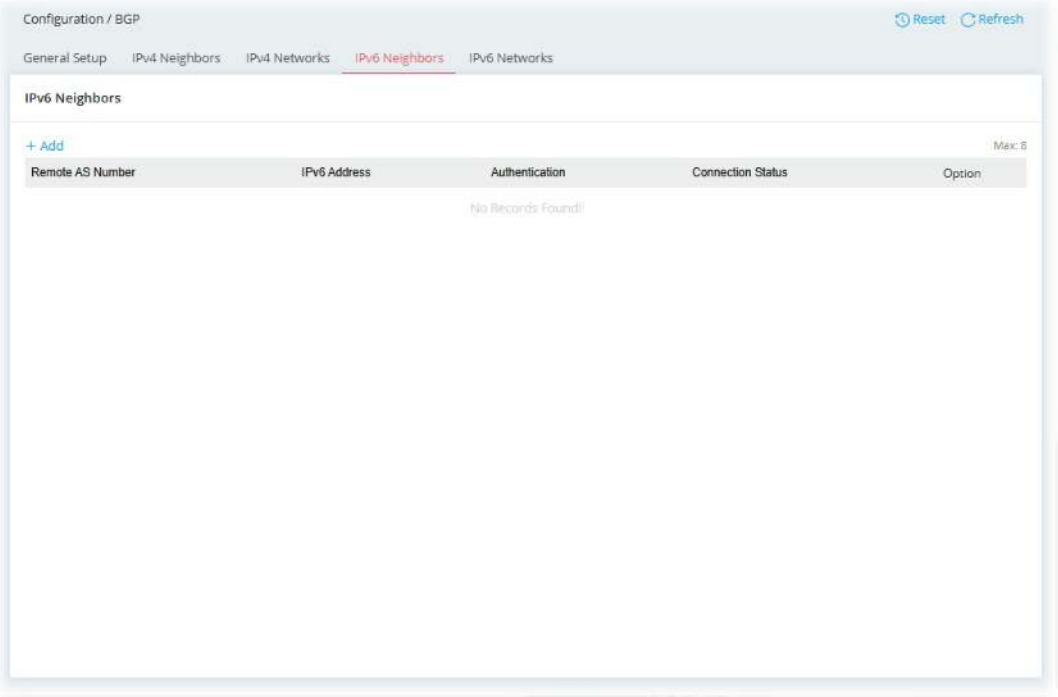
Available settings are explained as follows:

Item	Description
IPv4 Address	Enter the IPv4 address of a neighboring network (following CIDR format). Vigor router (e.g., 2136 series) will exchange routing information (RIP info) with the specified network.
Subnet Mask	Select the mask value for the IPv4 address specified above.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

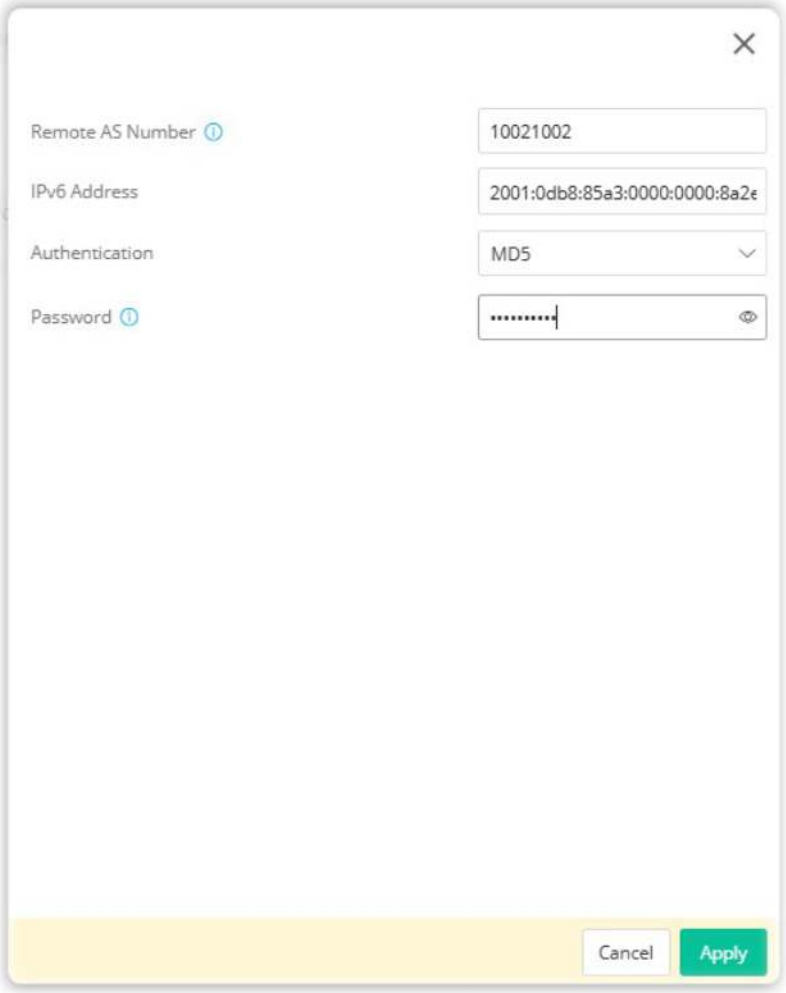
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-7-4 IPv6 Neighbors

Set general settings for local router and neighboring routers (based on IPv6 address).



To add a new IPv6 neighbors profile, click the **+Add** link to get the following page.



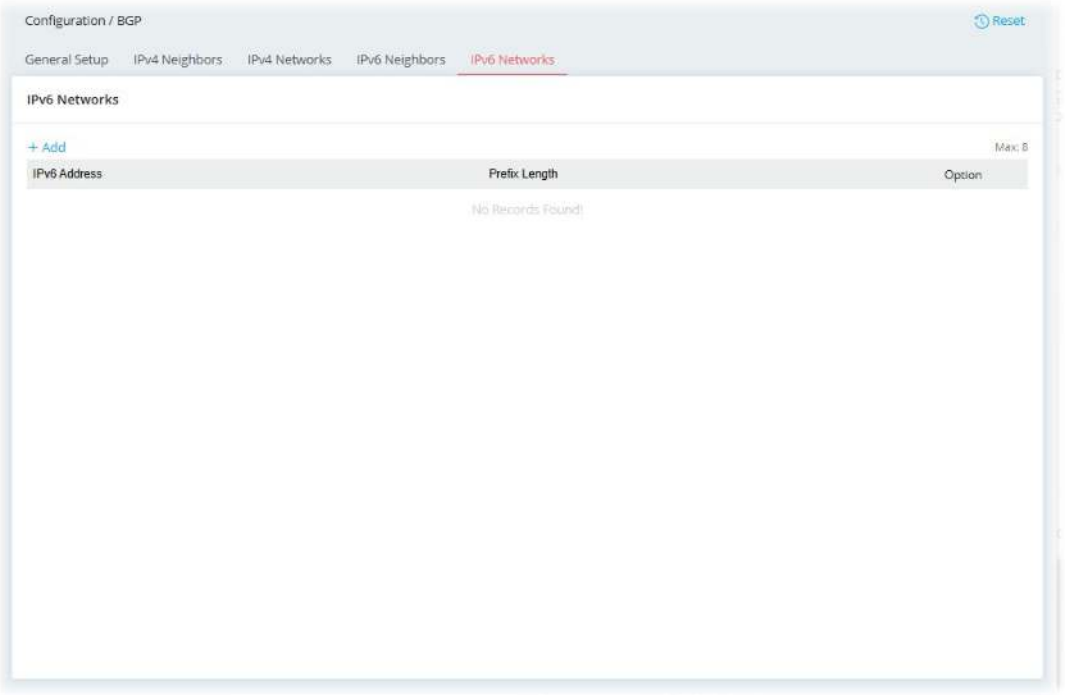
Available settings are explained as follows:

Item	Description
Remote AS Number	Specify the AS Number for neighboring router.
IPv6 Address	Enter the IPv6 address of a neighboring router.
Authentication	Select the authentication mechanism for this profile. Disabled – No authentication mechanism will be used. MD5 – Use MD5 authentication. • Password – Enter characters as the password for MD5 authentication.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-7-5 IPv6 Networks

This page allows you to configure up to eight neighboring networks for exchanging the routing information with the local router (Vigor2928). The IPv6 address defined on this page will be used to declare which network will participate in the RIPng protocol.



To add a new IPv6 networks profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
IPv6 Address	Enter the IPv6 address of a neighboring network (following CIDR format). Vigor router (e.g., 2928 series) will exchange routing information

	(RIPng info) with the specified network.
Prefix Length	Enter the IPv6 prefix length for the IPv6 address.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-8 OSPF

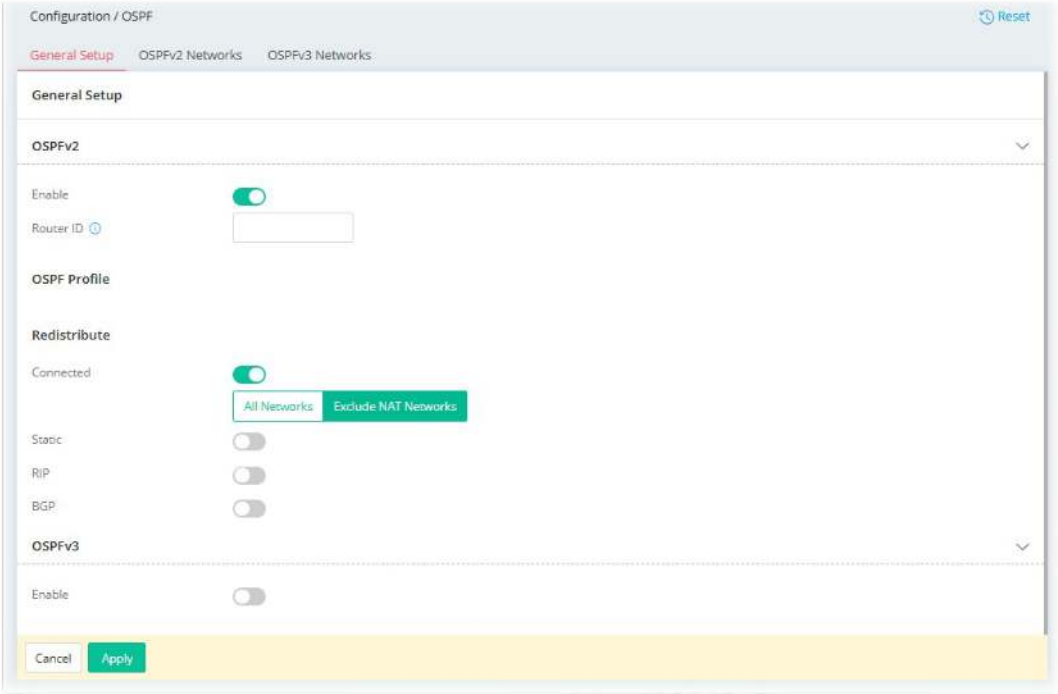
OSPF(Open Shortest Path First), running within the AS, is a routing protocol based on IP protocol. It uses the algorithm of SPF (Shortest Path First) to calculate the route metric. It is suitable for large network and complicated data exchange. Vigor router supports up to OSPF version 2(for IPv4) and OSPF version 3(for IPv6).

The Autonomous System (AS) used in OSPF can be divided into several areas. Usually, Area 0 will be used as OSPF backbone which distributing the routing information among areas.

When you need faster convergence than distance vector, want to support much larger networks or want to have less susceptible to bad routing information, you can enable OSPF feature to fit your request. Note that both routers must support OSPF function at the same time to build the OSPF connection.

II-1-8-1 General Setup

This page allows you to configure general settings for OSPFv2 (IPv4) and/or OSPFv3 (Ipv6) profile.



Available settings are explained as follows:

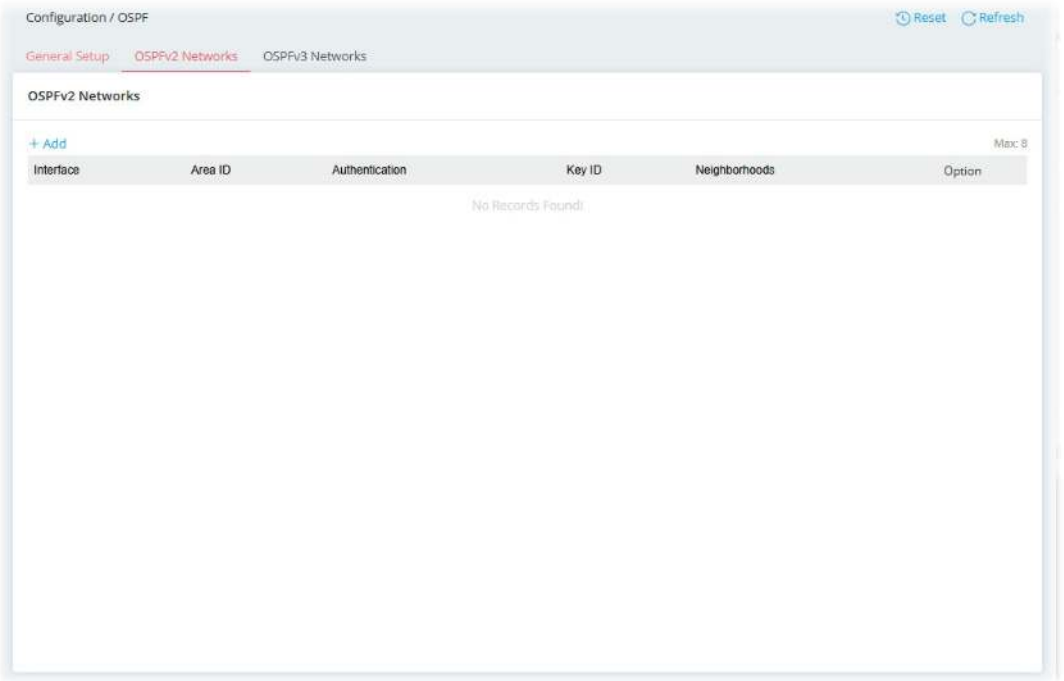
Item	Description
	General Setup
Enable	Switch the toggle to enable/disable the OSPFv2 function.
Router ID	Specify the IPv4 address of the Vigor router for routing and neighbor discovery. Such ID will help Vigor router to be identified in an autonomous system. However, if no address is specified, then an IP address of the active interface will be used by system automatically.
Connected	Switch the toggle to enable/disable the setting. All Networks – Apply the OSPF profile to all the LAN interfaces.

	Exclude NAT Networks - Apply the OSPF profile to all the LAN interfaces except for NAT network.
Static	Switch the toggle to apply the static route to the OSPF profile.
RIP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the RIP protocol) or disable the function.
BGP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the BGP protocol) or disable the function.
	OSPFv3
Enable	Switch the toggle to enable/disable the OSPFv3 function.
Router ID	Specify the IPv6 address of the Vigor router for routing and neighbor discovery. Such ID will help Vigor router to be identified in an autonomous system. However, if no address is specified, then an IP address of the active interface will be used by system automatically.
Connected	Switch the toggle to enable (apply the OSPFv3 settings to all the LAN interfaces) or disable the function.
Static	Switch the toggle to enable (apply the static route to the OSPFv3 profile) or disable the function.
RIP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the RIP protocol) or disable the function.
BGP	Switch the toggle to enable (allow dynamically route traffic based on information learned from the BGP protocol) or disable the function.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

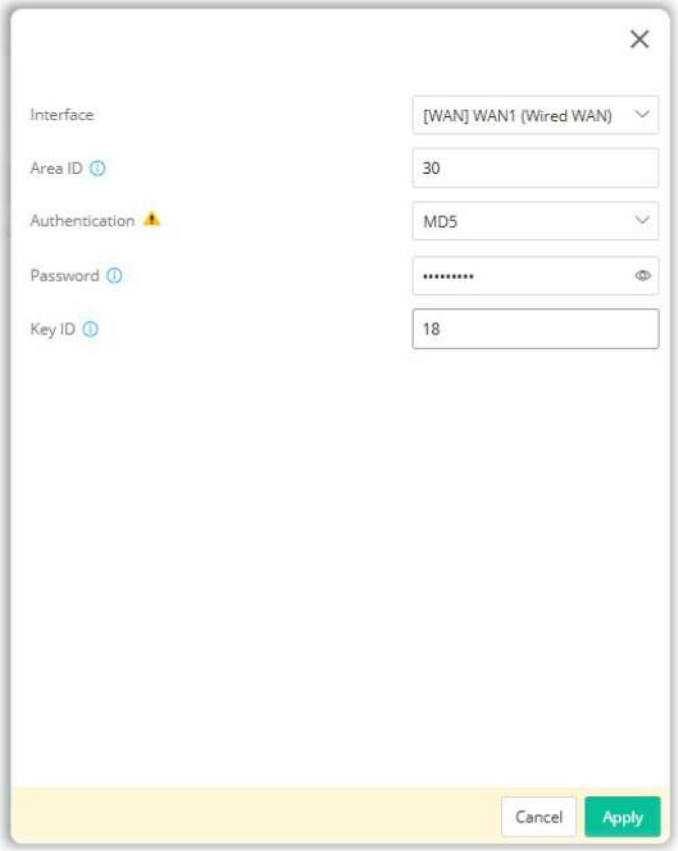
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-8-2 OSPFv2 Networks

This page allows you to set neighbors (by Area ID) for OSPFv2 profile.



To add a new OSPFv2 networks profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

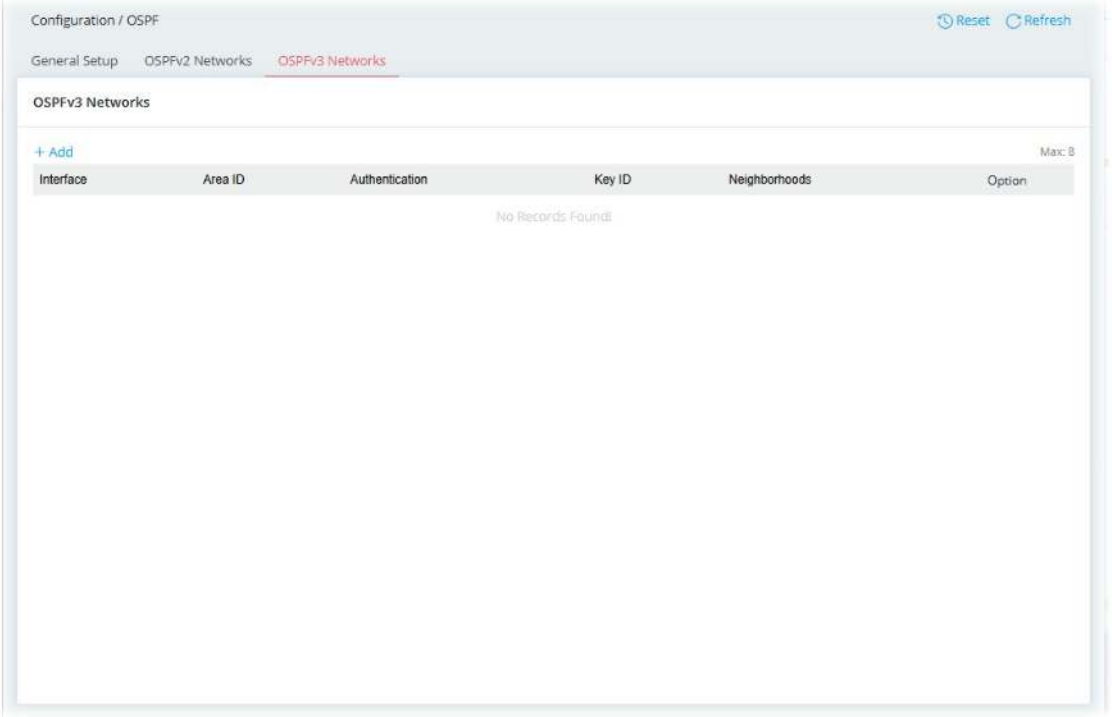
Item	Description
Interface	Select a LAN / WAN interface to apply the settings configured for this profile.
Area ID	An AS will be divided into several areas. Each area must be

	assigned with a dedicated number. Please enter a number or IPv4 address as the area ID.
Authentication	Select the authentication mechanism for this profile. Disabled – No authentication mechanism will be used. Plain-Text – Only password will be used for authentication. • Password –Enter characters as the password for MD5 authentication. MD5 – Use MD5 authentication. • Password – Enter characters as the password for MD5 authentication. • Key ID – Enter a number (0~255). The ID will help Vigor router to be identified in an autonomous system.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-8-3 OSPFv3 Networks

This page allows you to set neighbors for OSPFv3 profile.



To add a new OSPFv3 networks profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Interface	Select a LAN / WAN interface to apply the settings configured for this profile.
Area ID	An AS will be divided into several areas. Each area must be assigned with a dedicated number. Please enter a number or IPv6 address as the area ID.
Authentication	Select the authentication mechanism for this profile. Disabled – No authentication mechanism will be used. Plain-Text – Only password will be used for authentication. • Password –Enter characters as the password for MD5 authentication. HMAC-SHA-256 – Use HMAC authentication. • Password – Enter characters as the password for HMAC authentication. • Key ID – Enter a number (0~255). The ID will help Vigor router to be identified in an autonomous system.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

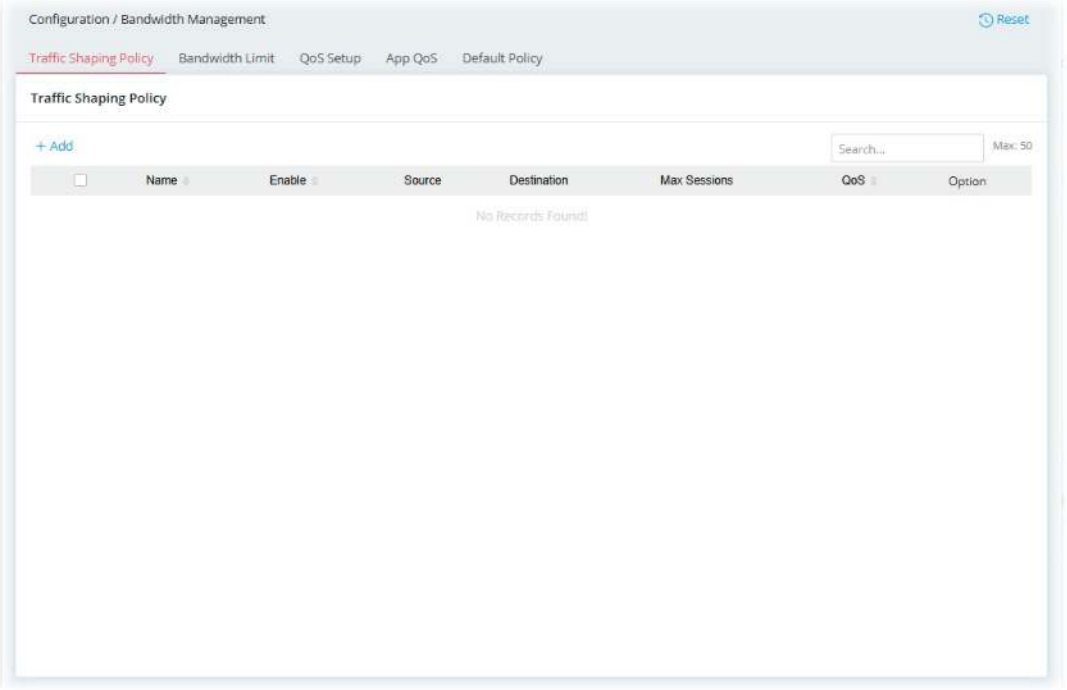
After finishing this web page configuration, please click Apply to save the settings.

II-1-9 Bandwidth Management

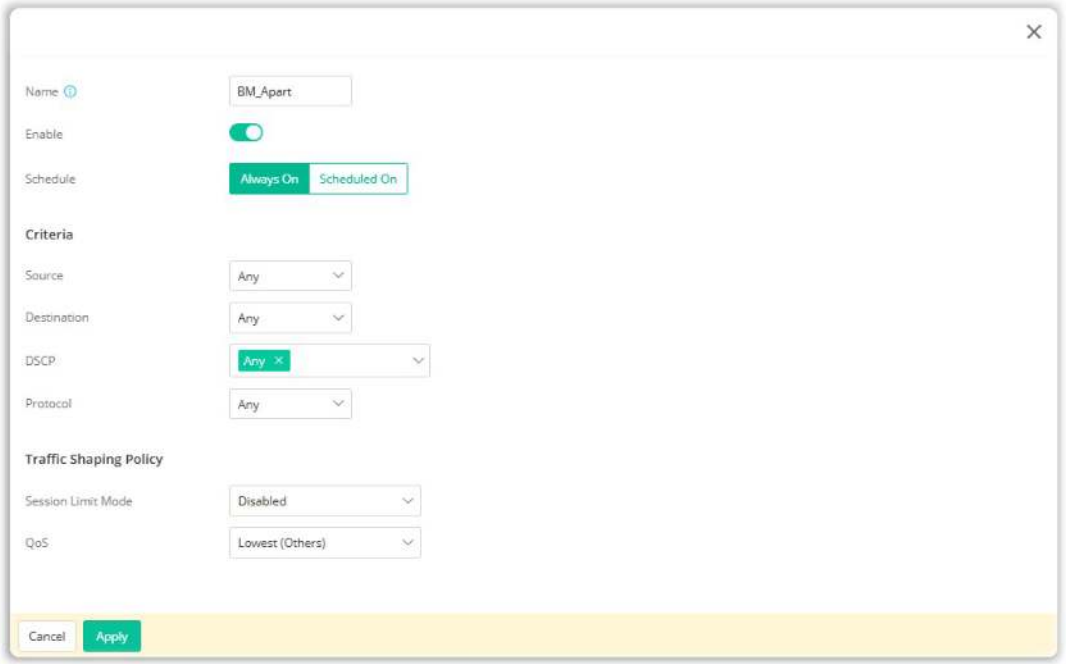
When LAN clients share a common public IP address by means of Network Address Translation (NAT), the router must track NAT sessions so that traffic to and from the WAN can reach the intended destinations. There is an finite number of sessions that can be tracked by the router, and by setting session limits will ensure that the router does not run out of resources. This is especially important when P2P applications are used. P2P applications, such as BitTorrent, that attempt to simultaneously establish connections to as many WAN hosts as possible.

II-1-9-1 Traffic Shaping Policy

This page allows you to configure the session limits and QoS settings.

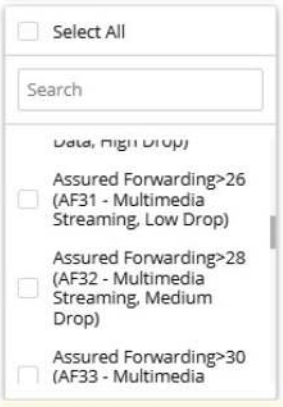


To add a new policy, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter a name for identification.
Enable	Switch the toggle to enable/disable the traffic shaping policy profile.
Schedule	Vigor router can perform the traffic shaping policy profile all the time or on a certain date and time. Always On - The function of traffic shaping policy profile is running all the time. Scheduled On - The function of traffic shaping policy profile is activated based on the schedule profile.
Criteria	
Source / Destination	Specify the IP type. Vigor router will restrict the sessions for the IPs by the default policy. • Any – If Any is selected, the limitation will applied to any IP. • IPv4 Address • IPv4 Subnet • IPv6 Address • IPv6 Subnet • IP Object • IP Group
Source / Destination IPv4 Address	It is available when Source / Destination is set as IPv4 Address. +Add – Click to create a new entry. IPv4 Address Start / End - Enter an IPv4 address as the starting point. And, enter another IPv4 address as the ending point.
Source / Destination IPv4 Subnet Address	It is available when Source / Destination is set as IPv4 Subnet. +Add – Click to create a new entry. IPv4 Address – Enter an IPv4 address.

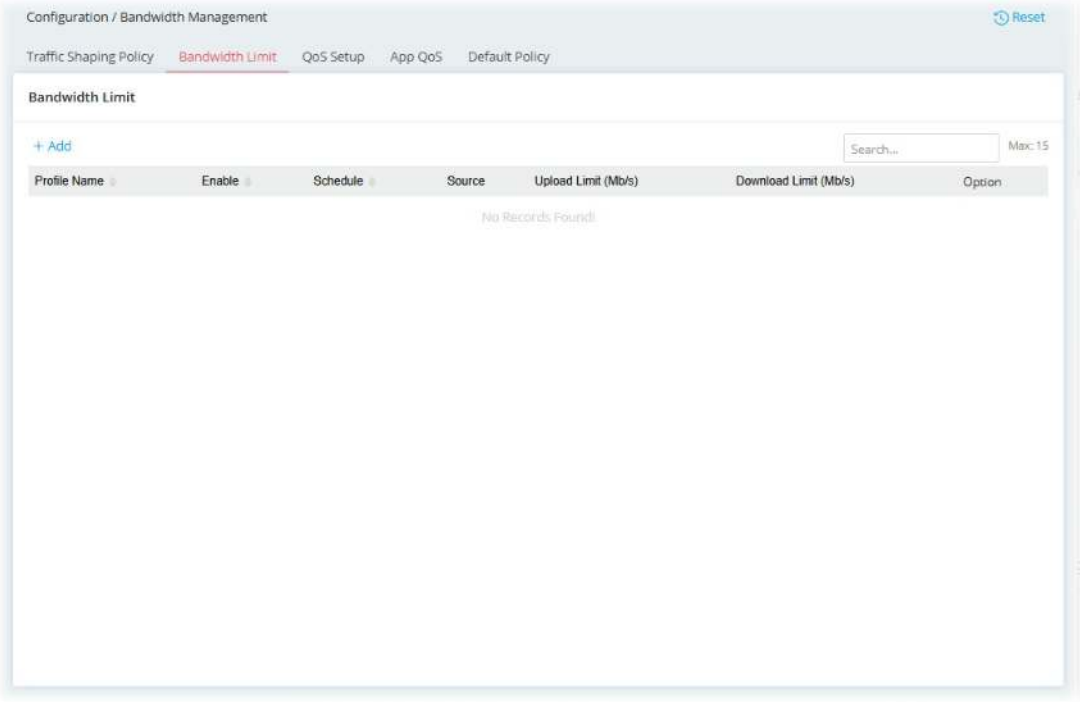
	Subnet Mask – Specify the subnet mask for the IPv4 address.
Source / Destination IPv6 Address	It is available when Source / Destination is set as IPv6 Address. +Add – Click to create a new entry. IPv6 Address Start / End - Enter an IPv6 address as the starting point. And, enter another IPv6 address as the ending point.
Source / Destination IPv6 Subnet Address	It is available when Source / Destination is set as IPv6 Subnet. +Add – Click to create a new entry. IPv6 Address – Enter an IPv6 address. Prefix Length – Set the prefix length for the IPv6 address.
Source / Destination IP Object	It is available when Source / Destination is set as IP Object. +Add – Up to 12 objects can be specified here. Select Object – Select the object(s) from the available object list on the right side.
Source / Destination IP Group	It is available when Source / Destination is set as IP Group. +Add – Up to 12 groups can be specified here. Select Group - Select the object(s) from the available group list on the right side.
DSCP	It displays the levels of the data for processing with QoS control. Select DSCP or ToS precedence of packets to which this rule applies. 
Protocol	Only the traffic passing through the selected protocol will be limited. Select one of the protocols from the drop-down menu. Any – All traffic will be limited. Service Type Object – Vigor system offers several service types set with different protocols. • Service Type Object – Click +Add to create a new object. Up to 12 objects can be created. TCP/UDP – Select Transmission Control Protocol/User Datagram Protocol. • Specify Source Port – Switch the toggle to enable the setting of Source Port. • Source Port / Destination Port – Set the port range (1 to 65535). TCP – Transmission Control Protocol. Setting method is the same as TCP/UDP. UDP – User Datagram Protocol. Setting method is the same as

	TCP/UDP.
	Traffic Shaping Policy
Session Limit Mode	Disabled – Select to deactivate session limit function. Per Source IP Limit – Apply the session limit to the traffic. • Max Sessions - The default maximum number of sessions allowed per LAN client, unless overridden by specifying a different number in the Limitation List.
QoS	Select the class level (Class 1, Class 2, Class 3 and others) of bandwidth which will be applied to this profile. 
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

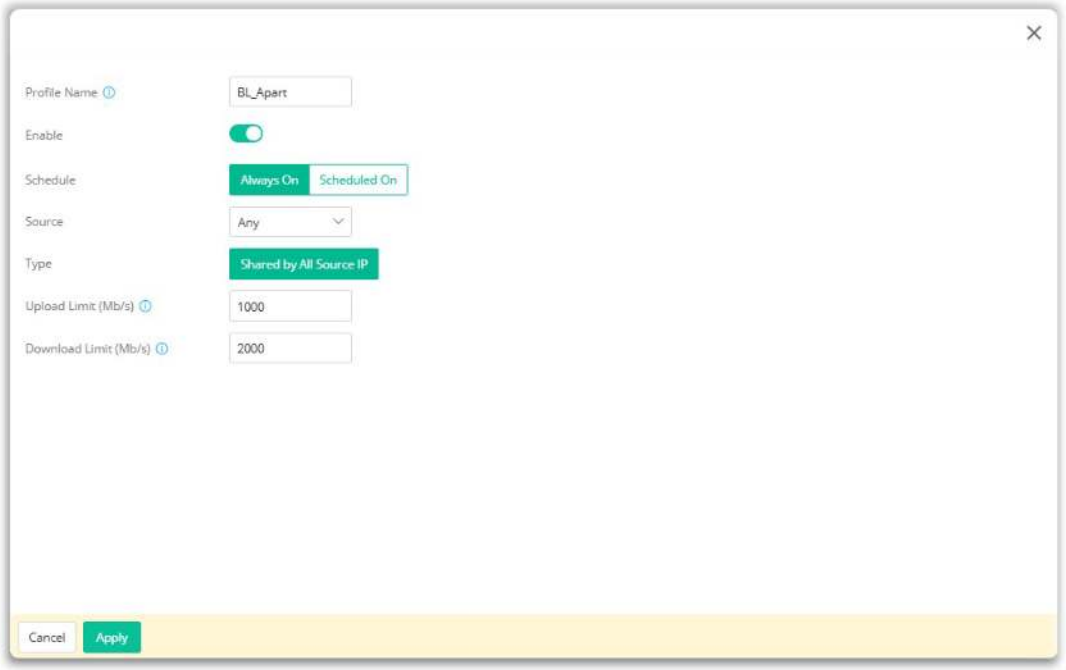
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-9-2 Bandwidth Limit

Bandwidth Limit ensures LAN clients get their fair share of network bandwidth by placing restrictions on upstream and downstream network speeds.



To add a new policy, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Profile Name	Enter a string as the profile name.
Enable	Switch the toggle to enable/disable this profile of bandwidth limit.
Schedule	Vigor router can perform the bandwidth limit all the time or on a certain date and time. Always On - The function of bandwidth limit is running all the time. Scheduled On - The function of bandwidth limit is activated based on the schedule profile.
Source	Identify the object to which the bandwidth limit will be applied. ● Any - All the IPs within the range defined will be restricted by bandwidth limit defined by TX Limit and RX Limit below. ● IPv4 Address ● IPv4 Subnet ● IP Object ● IP Group
Source IPv4 Address	It is available when IPv4 Address is selected as the Source. Click +Add to add a new entry. ● IPv4 Address Start - The beginning IP address for this limit entry. ● IPv4 Address End - The ending IP address for limit entry.
Source IPv4 Subnet Address	It is available when IPv4 Subnet is selected as the Source. Click +Add to add a new entry. ● IPv4 Address - Specify Start IP Address. ● Subnet Mask - Select a Subnet Mask.
Source IP Object	It is available when IP Object is selected as the Source. All the IPs specified by the selected IP object will be restricted by bandwidth limit defined by TX Limit and RX Limit below. Click on +Add to open the IP object table. Select the IP object(s)

	and click Close. A new entry will be added immediately.
Source IP Group	It is available when IP Group is selected as the Source. All the IPs specified by the selected IP group will be restricted by bandwidth limit defined by TX Limit and RX Limit below. Click on +Add to open the IP Group table. Select the IP group(s) and click Close. A new entry will be added immediately.
Upload Limit	Upstream speed limit for each LAN client. Value must be between 1 and 3999 (Mbps).
Download Limit	Downstream speed limit for each LAN client. Value must be between 1 and 3999 (Mbps).
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

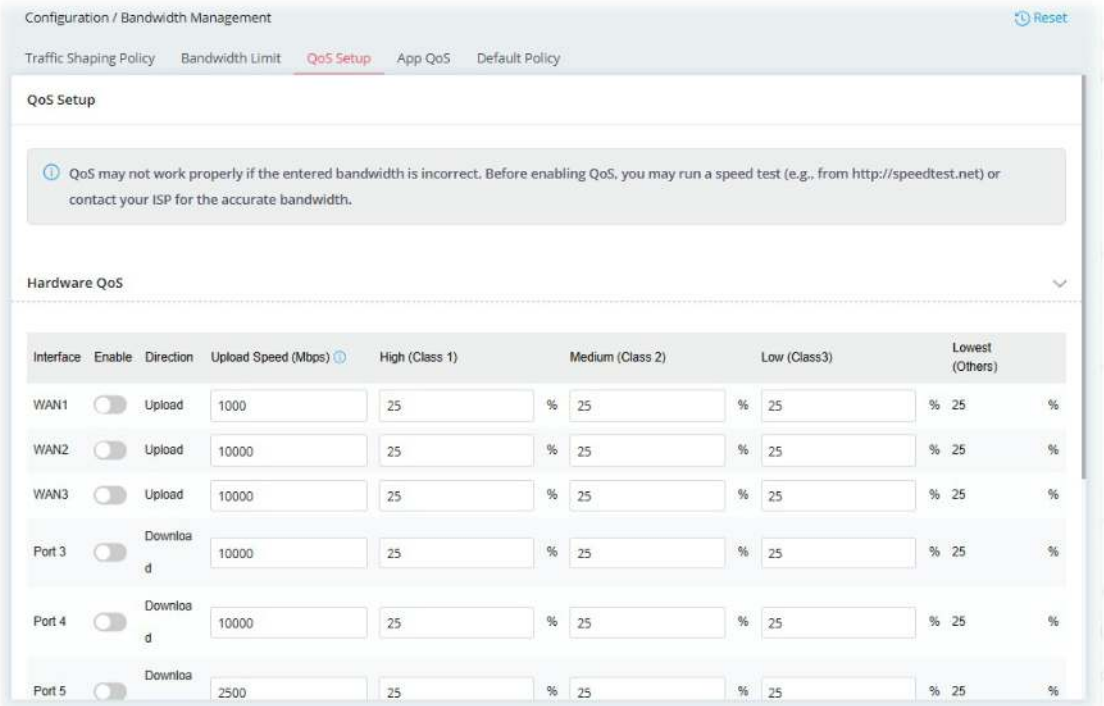
II-1-9-3 QoS Setup

QoS (Quality of Service) ensures that all LAN clients receive their fair share of bandwidth that is required for applications to function properly and efficiently.

Without QoS, it is possible that certain applications may consume excessive network resources that they degrade performance of more important applications, especially ones that are less tolerant of jitter (delay variation) or lost or delayed packets. Additionally, at times of network congestion, QoS is able to prioritize different types of traffic according to their predefined priority, thus ensuring traffic of higher importance gets processed first.

A typical QoS deployment consists of two components:

- Classification: Identifying low-latency or crucial applications and marking them for high-priority service level enforcement throughout the network.
- Scheduling: Prioritizing packets by assigning them to different queues and service types according to service levels.



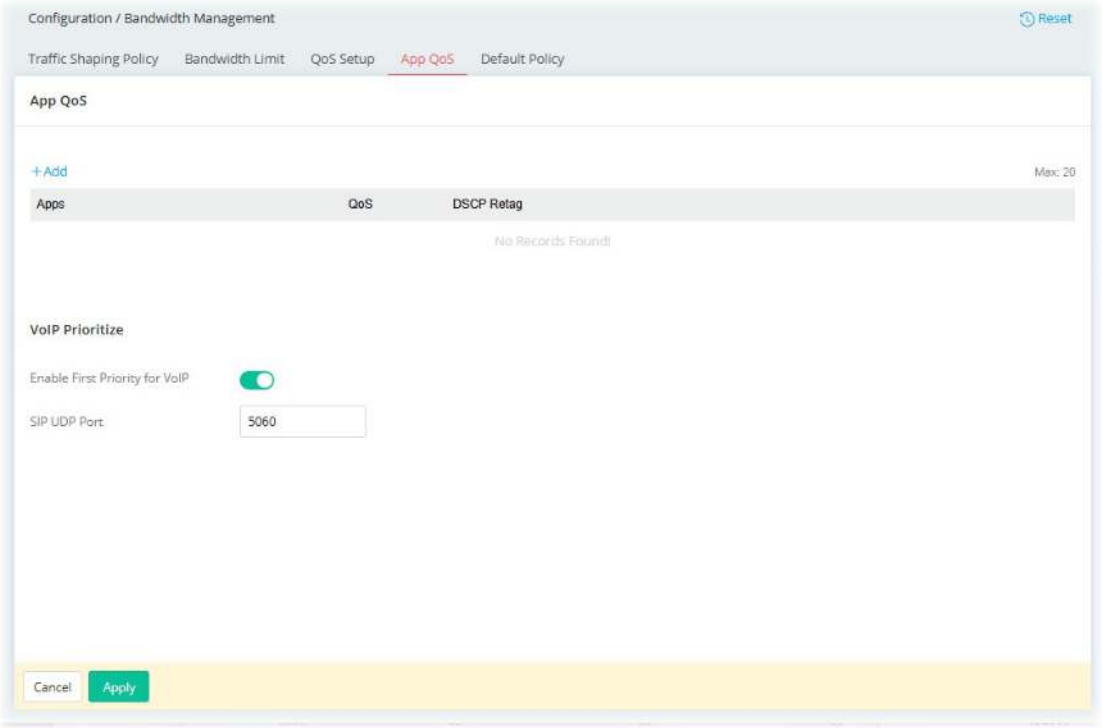
Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable/disable the WAN interface settings.
Direction	At present, only Upload (for outgoing traffic) is available.
Upload Speed(Mbps)	Set the outbound bandwidth (default is 2500) of the WAN/LAN.
High(Class 1)	Set the percentage of bandwidth (upload speed) reserved for class 1.
Medium(Class 2)	Set the percentage of bandwidth (upload speed) reserved for class 2.
Low(Class 3)	Set the percentage of bandwidth (upload speed) reserved for class 3.
Lowest(Others)	Set the percentage of bandwidth (upload speed) reserved for others.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-9-4 APP QoS

APP QoS allows QoS to be applied to select protocols and applications.



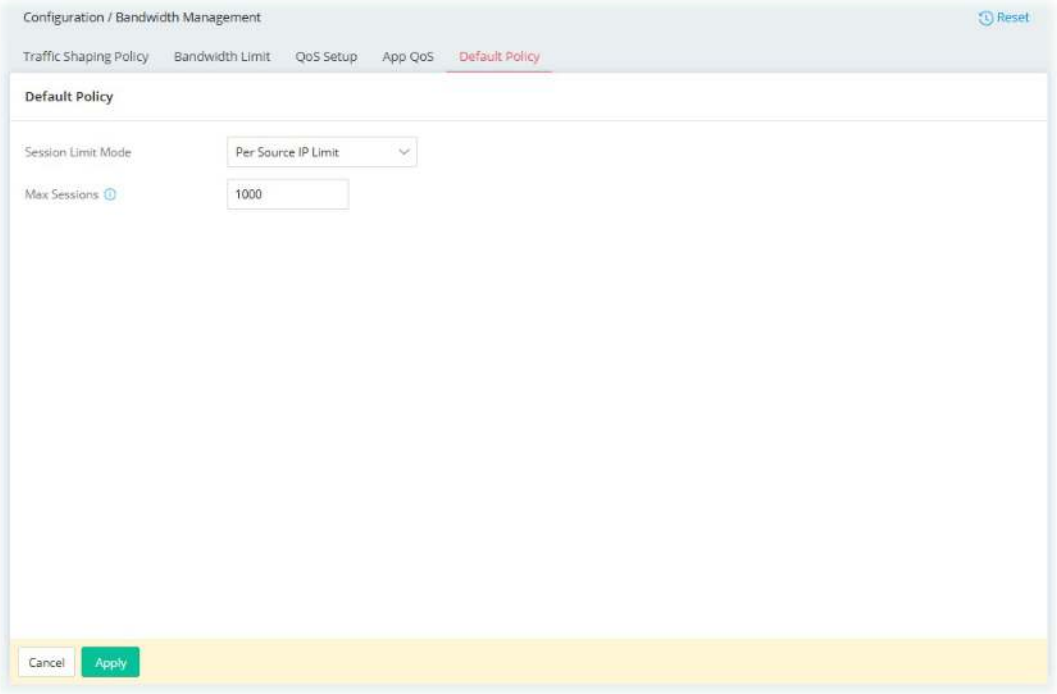
Available settings are explained as follows:

Item	Description
+Add	**Apps** – The drop-down menu displays various APPEs. Select the one you want. **QoS** – Select the class level (Class 1, Class 2, Class 3 and others) of bandwidth reserved for the Apps. **DSCP Retag** – Select the level of the data for processing with QoS control. **Delete** – Click to remove the selected entry.
VoIP Prioritize	
Enable First Priority for VoIP	Switch the toggle to enable/disable the function. If enabled, it allows VoIP traffic to receive the highest priority.
SIP UDP Port	Enter a port number to be monitored for SIP traffic.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-9-5 Default Policy

Default policy defines the bandwidth limit and the session limit for all traffic in default.



Available settings are explained as follows:

Item	Description
Session Limit Mode	Disabled – Select to deactivate session limit function. Per Source IP Limit –Apply the session limit to the traffic. • Max Sessions - The default maximum number of sessions allowed per LAN client, unless overridden by specifying a different number in the Limitation List.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-10 NAT

Most ISPs allocate one WAN IP address to each subscriber. In order to simultaneously connect multiple devices to the Internet, a technique called Network Address Translation is employed.

Usually, the router serves as an NAT (Network Address Translation) router. NAT is a mechanism that one or more private IP addresses can be mapped into a single public one. Public IP address is usually assigned by your ISP, for which you may get charged. Private IP addresses are recognized only among internal hosts.

When the outgoing packets destined to some public server on the Internet reach the NAT router, the router will change its source address into the public IP address of the router, select the available public port, and then forward it. At the same time, the router shall list an entry in a table to memorize this address/port-mapping relationship. When the public server response, the incoming traffic, of course, is destined to the router's public IP address and the router will do the inversion based on its table. Therefore, the internal host can communicate with external host smoothly.

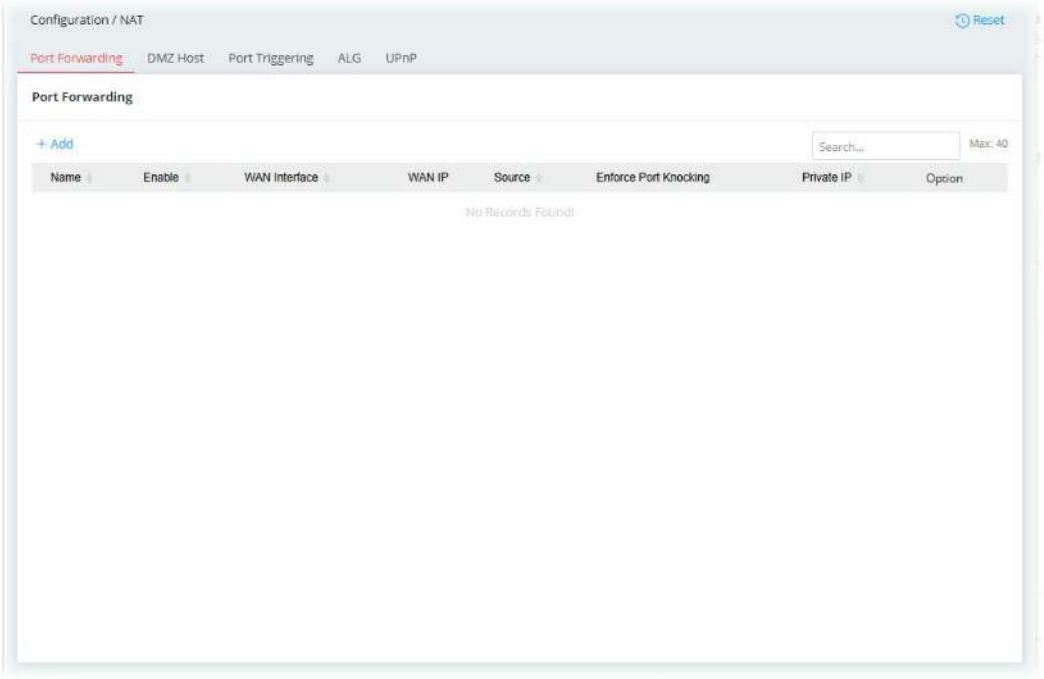
The benefit of the NAT includes:

- **Save cost on applying public IP address and apply efficient usage of IP address.** NAT allows the internal IP addresses of local hosts to be translated into one public IP address, thus you can have only one IP address on behalf of the entire internal hosts.
- **Enhance security of the internal network by obscuring the IP address.** There are many attacks aiming victims based on the IP address. Since the attacker cannot be aware of any private IP addresses, the NAT function can protect the internal network.

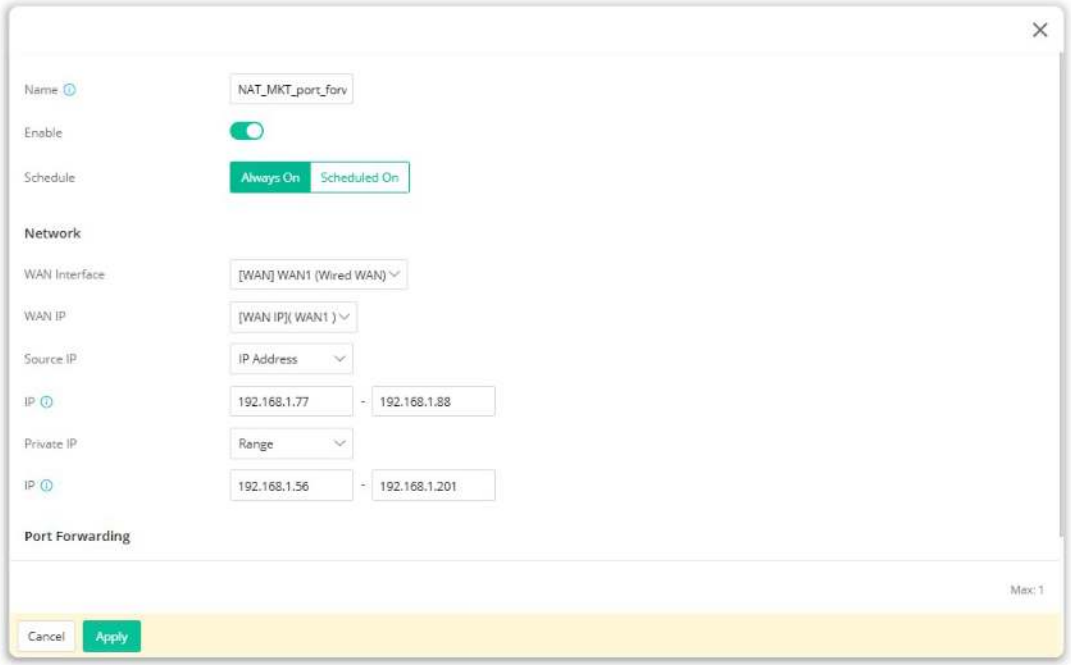
II-1-10-1 Port Forwarding

This function allows inbound traffic from specific ports on WAN interfaces to be forwarded to LAN clients.

It allows you to open a range of ports for the traffic of special applications.

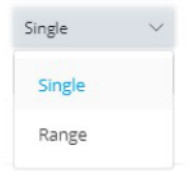


To add a new forwarding policy, click the **+Add** link to get the following page.

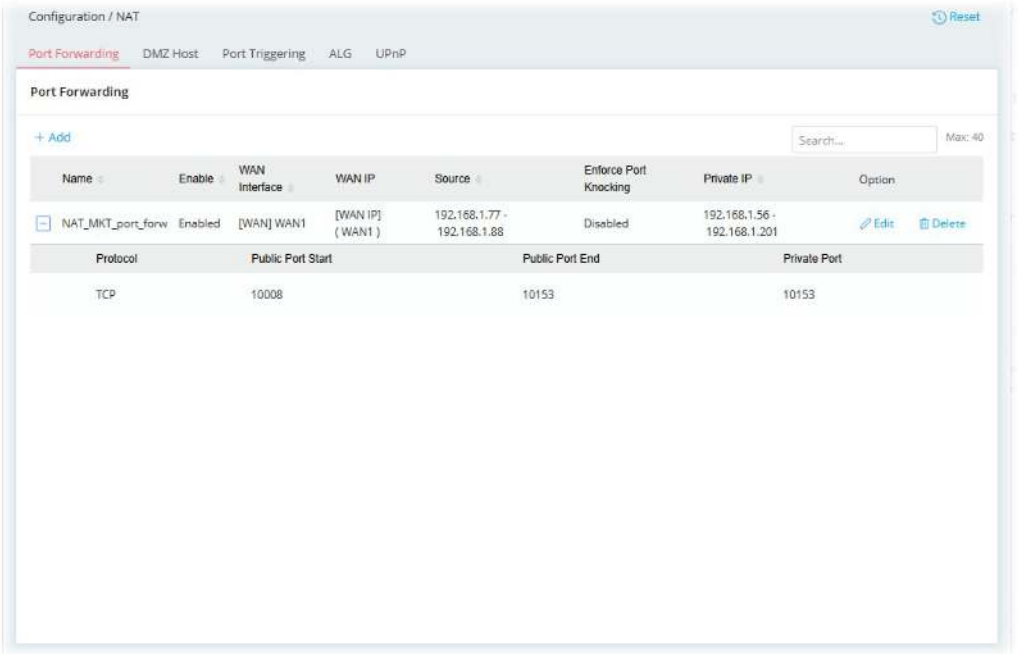


Available settings are explained as follows:

Item	Description
Name	Enter a name that identifies the rule.
Enable	Switch the toggle to enable or disable the function.
Schedule	Vigor router can perform the port forwarding all the time or on a certain date and time. Always On - The function of port triggering is running all the time. Scheduled On - The function of port triggering is activated based on the schedule profile.
Network	
WAN Interface	The WAN port(s) whose incoming traffic will be forwarded to a LAN client. Select from a specific WAN interface WAN# to apply the rule to the WAN interface.
WAN IP	Select a WAN IP to match WAN interface.
Source IP	 Any – Any data traffic coming from the source IP will be forwarded to a LAN. IP Address – Set a range of IP addresses. Any data traffic coming from the IP addresses within the range will be forwarded to a LAN. IP Object – • IP Object – Use the drop down list to specify an IP object profile.

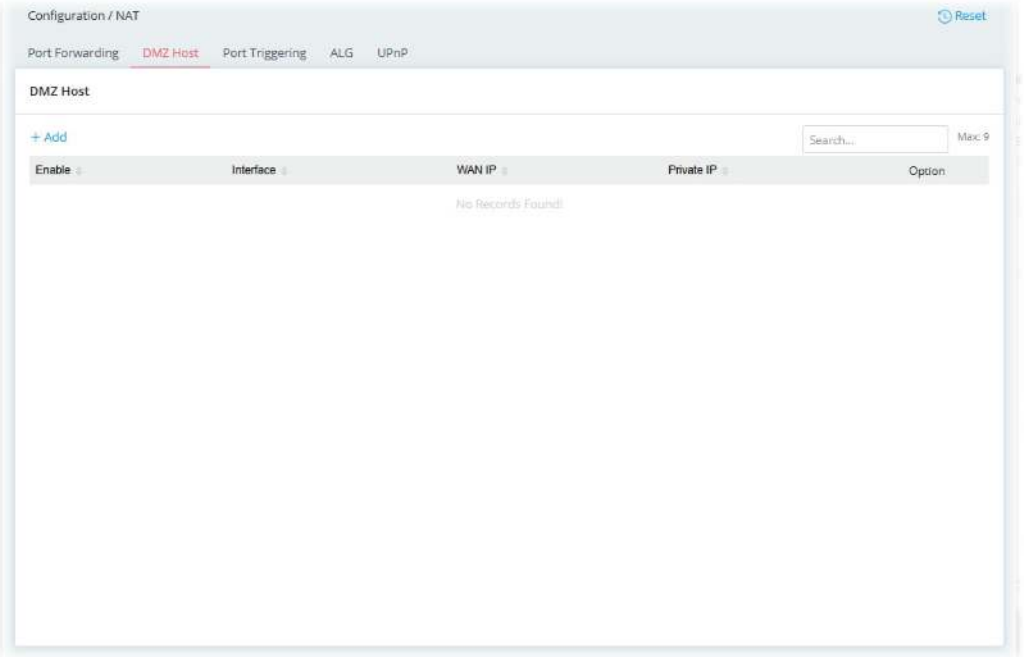
	IP Group – • IP Group - Use the drop down list to specify an IP group profile.
Private IP	Specify a LAN IP address or a range of LAN IP addresses to which the traffic will be forwarded.  Single – Specify a destination LAN IP address that will receive the forwarded traffic. Range – Specify a range of destination LAN IP addresses that will receive the forwarded traffic.
Port Forwarding	
+Add	Click to set port numbers for the specified protocol (TCP, UDP, or TCP/UDP) for a port forwarding profile.
Protocol	The protocol to which this rule applies, TCP, UDP or TCP/UDP.
Public Port Start	Specify which port can be redirected to the specified Private IP and Port of the internal host. Enter the required number as the starting port.
Public Port End	Enter the required number as the ending port.
Private Port Start	The port on each LAN client to which the traffic will be directed to. Enter the required number as the starting port.
Private Port End	Enter the required number as the ending port.
Option	Click Delete to remove the selected entry.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

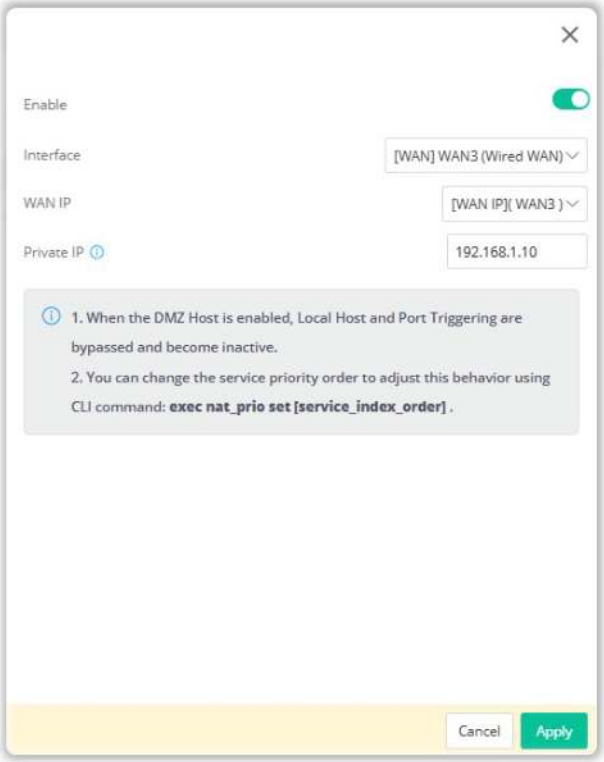

Configuration / NAT
Reset
Port Forwarding
DMZ Host
Port Triggering
ALG
UPnP
Port Forwarding
+ Add
Search...
Max: 40
Name
Enable
WAN Interface
WAN IP
Source
Enforce Port Knocking
Private IP
Option
NAT_MKT_port_forw
Enabled
[WAN] WAN1
[WAN IP] (WAN1)
192.168.1.77 - 192.168.1.88
Disabled
192.168.1.56 - 192.168.1.201
Edit
Delete
Protocol
Public Port Start
Public Port End
Private Port
TCP
10008
10153
10153

II-1-10-2 DMZ Host

Vigor router provides a facility **DMZ Host** that maps ALL unsolicited data on any protocol to a single host in the LAN. Regular web surfing and other such Internet activities from other clients will continue to work without inappropriate interruption. **DMZ Host** allows a defined internal user to be totally exposed to the Internet, which usually helps some special applications such as Netmeeting or Internet Games etc.



To add a new DMZ host profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable or disable the function.
Interface	Allows WAN traffic to be sent to a specific LAN IP address.
WAN IP	Enable the function of applying WAN alias IP. Then, select a WAN alias IP from the available IPv4 alias settings set on Configuration >> WAN >> WAN Connections.
Private IP	Enter an IP address to be the DMZ host.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-10-3 Port Triggering

If you run programs that function as server applications where they expect to receive unsolicited traffic from the WAN, you can set up rules in Port Triggering to detect LAN-to-WAN traffic initiated by those programs, and automatically open up WAN ports to accept incoming traffic and forward it to the LAN client running the server applications.

The duration that these ports are opened depends on the type of protocol used. The "default" values are shown below and these duration values can be modified via telnet commands.

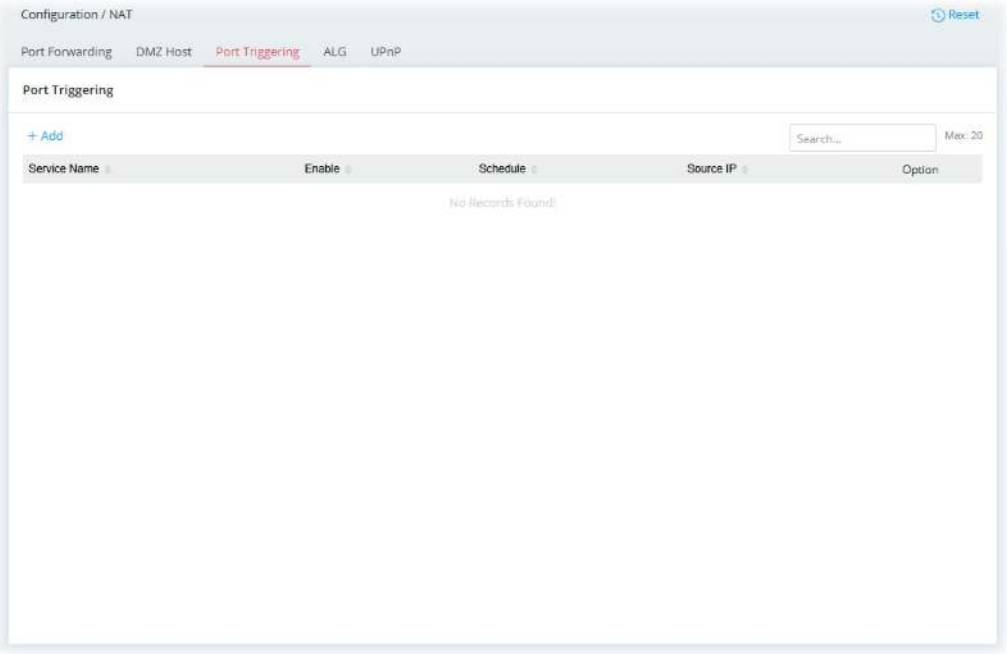
TCP: 86400 sec.

UDP: 180 sec.

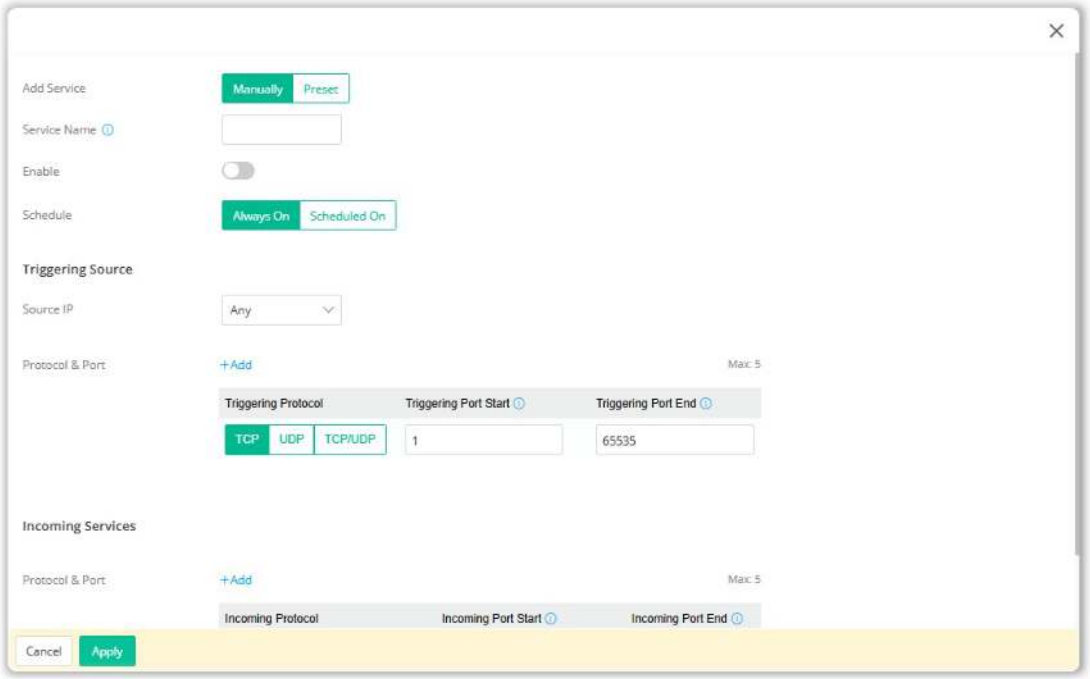
IGMP: 10 sec.

TCP WWW: 60 sec.

TCP SYN: 60 sec.



To add a new port triggering profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Add Service	Select from list of predefined service, or manually configure triggering and incoming protocols and ports. Manually - If selected, self-define the service name. ● Service Name – Enter the name of the service. Preset - If selected, various services will be offered for you to choose as the service name. ● Service Name – Use the drop-down list to specify one service.
Enable	Switch the toggle to enable or disable the function of port triggering.
Schedule	Vigor router can perform the port triggering all the time or on a certain date and time. Always On - The function of port triggering is running all the time. Scheduled On - The function of port triggering is activated based on the selected schedule profile.
	Triggering Source
Source IP	Any - Any source IP will be forwarded to a LAN. IP Address - Set a range of IP addresses forwarded to a LAN. ● IP Address – Enter the IP address and the subnet mask. IP Object – Click +Add to specify the IP object profile (up to 12 profiles). IP Group - Click +Add to specify the IP group profile (up to 12 profiles).
Protocol & Port	+Add - Click to set the port numbers (start and end) for the specified protocol (TCP, UDP or TCP/UDP) for the outgoing data (that this rule monitors). Triggering Protocol - The protocol(s) of the outgoing traffic. ● TCP - open port(s) to TCP traffic. ● UDP - open port(s) to UDP traffic.

	● TCP/UDP - open port(s) to both TCP and UDP traffic. Select the protocol (TCP, UDP or TCP/UDP) for the outgoing data of such triggering profile. Triggering Port Start / Triggering Port End - Outgoing traffic from the WAN destined for these port numbers be forwarded to the LAN client that triggered the rule. Enter the port or port range for the outgoing packets.
	Incoming Services
Protocol & Port	+Add - Click to set port numbers (start and end) for the specified protocol (TCP, UDP or TCP/UDP) for the incoming data. Incoming Protocol - The protocol(s) of the incoming traffic. ● TCP - open port(s) to TCP traffic. ● UDP - open port(s) to UDP traffic. ● TCP/UDP - open port(s) to both TCP and UDP traffic. Select the protocol (TCP, UDP or TCP/UDP) for the incoming data of such triggering profile. Incoming Port Start / Incoming Port End - Incoming traffic from the WAN destined for these port numbers be forwarded to the LAN client that triggered the rule. Enter the port or port range for the incoming packets.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

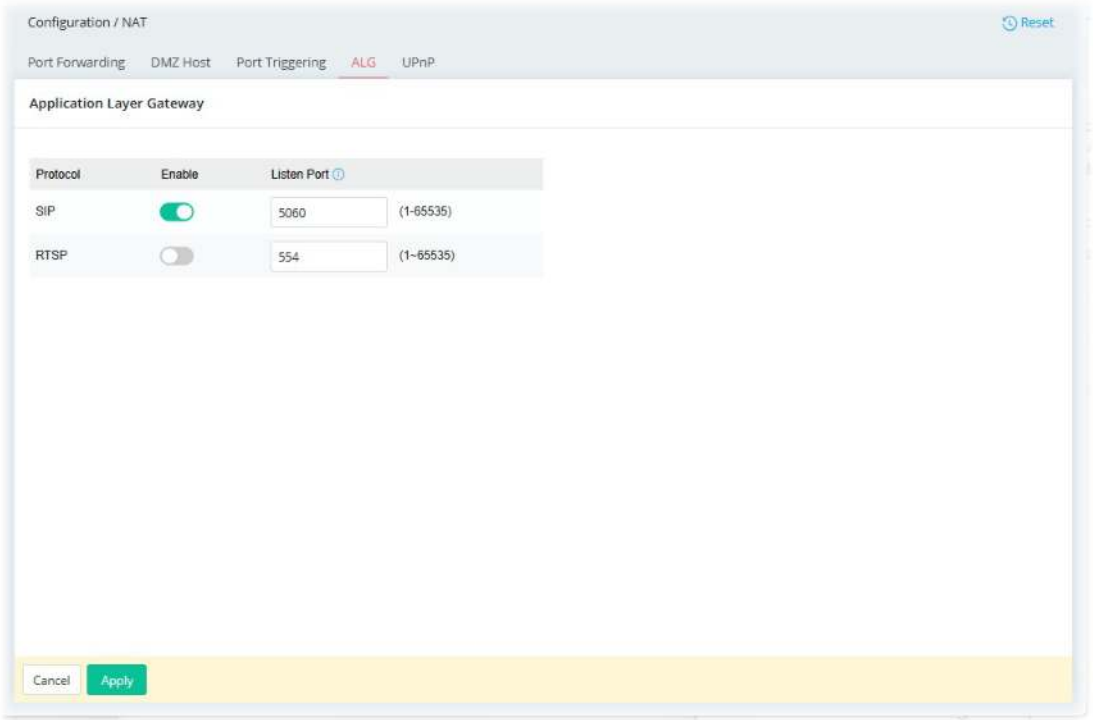
After finishing this web page configuration, please click Apply to save the settings.

II-1-10-4 ALG

ALG means Application Layer Gateway. There are two methods provided by Vigor router, RTSP (Real Time Streaming Protocol) ALG and SIP (Session Initiation Protocol) ALG, for processing the packets of the voice and the video.

RTSP ALG makes RTSP message, RTCP message, and RTP packets of voice and video be transmitted and received correctly via NAT by Vigor router.

However, SIP ALG makes SIP message and RTP packets of voice be transmitted and received correctly via NAT by Vigor router.



Available settings are explained as follows:

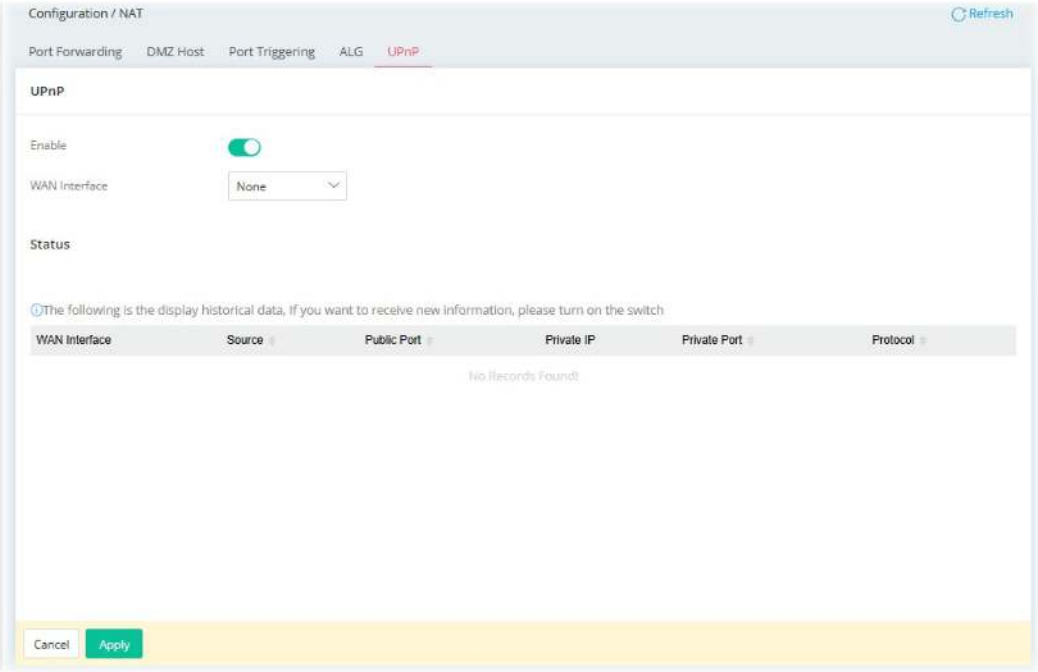
Item	Description
Enable	Switch the toggle to enable or disable the function.
Listen Port	Enter a port number for SIP or RTSP protocol.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-10-5 UPnP

The Vigor supports UPnP (Universal Plug and Play), which is a suite of network protocols that simplifies network configuration. Applications and network devices on the LAN, that support UPnP, may request the router to modify its settings to allow NAT Traversal, so that WAN hosts can connect to them directly.

Examples of applications and devices that support UPnP include file-sharing applications such as uTorrent, Vuze and eMule, gaming consoles such as the Sony PlayStations 3 and 4 Xbox 360 and Xbox One, media streaming applications such as Plex and XBMC, and messaging and calling applications such as Skype. To find out if a certain application or network device supports or requires UPnP, please consult its user manual or check with its vendor.



Available settings are explained as follows:

Item	Description
	UPnP
Enable	Switch the toggle to enable or disable the function. UPnP is required for some applications such as PPS, Skype, eMule...and etc. If you are not familiar with UPnP, it is suggested to turn off this function for security.
WAN Interface	Select the WAN port on which ports will be opened in response to UPnP commands.
Status	Displays the historical data.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

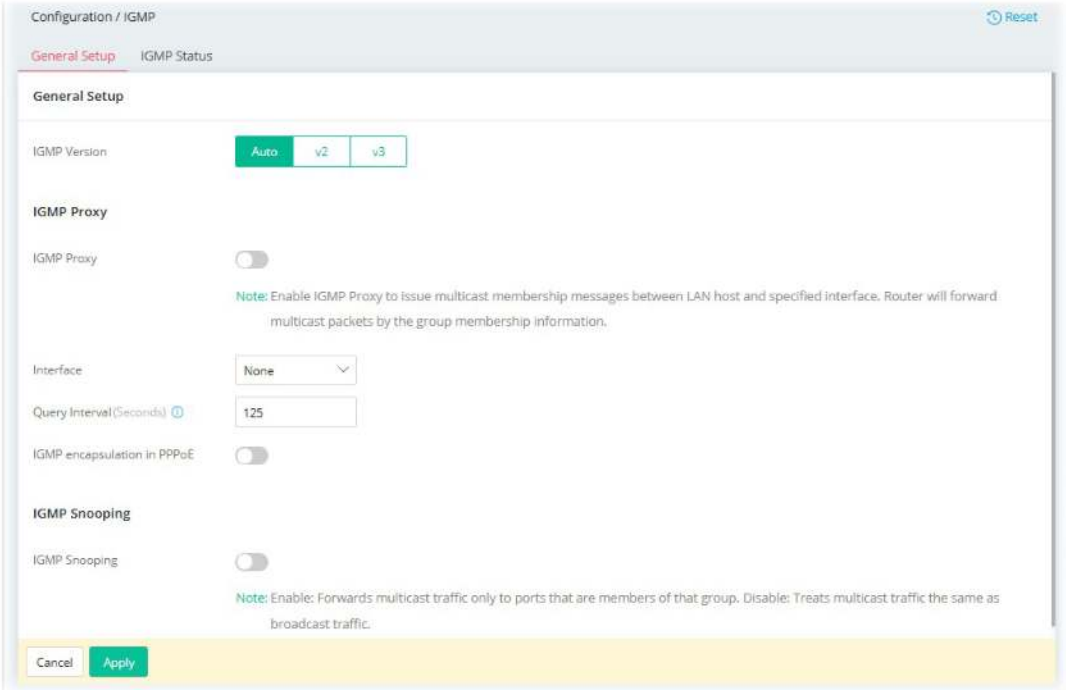
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-11 IGMP

Internet Group Management Protocol (IGMP) is an IPv4 communication protocol for establishing multicast group memberships.

II-1-11-1 General Setup

This page offers the general setting for configuring the IGMP function.



Available settings are explained as follows:

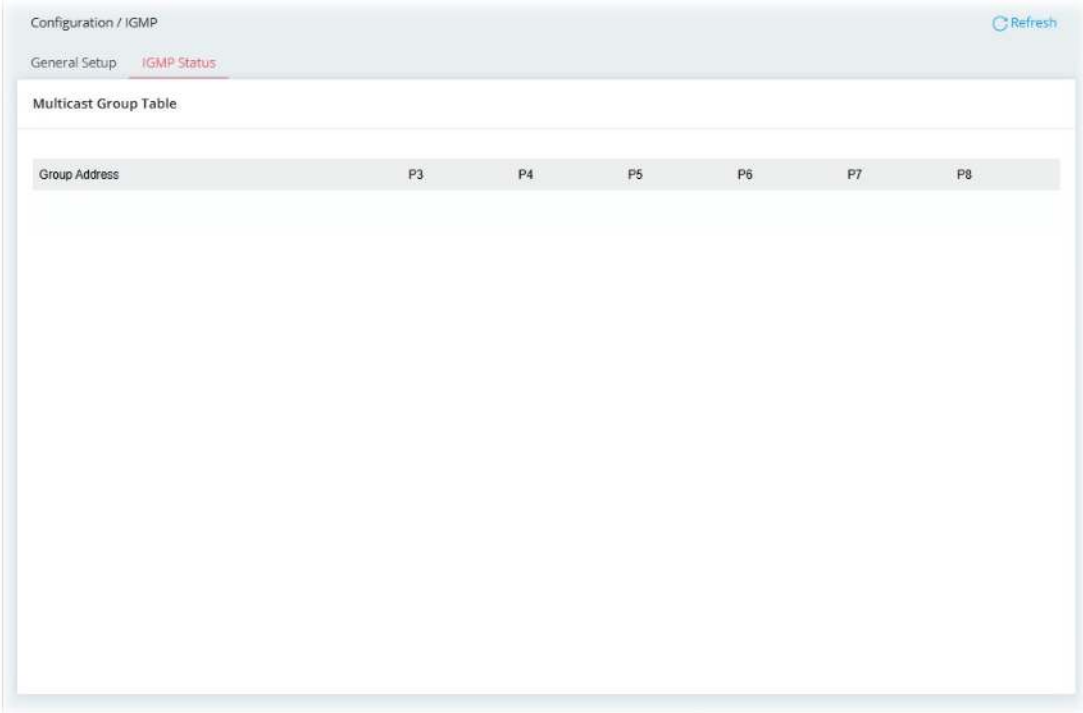
Item	Description
IGMP Version	Select v2 or v3 or Auto. At present, two versions (v2 and v3) are supported by Vigor router. Choose the correct version based on the IPTV service you subscribe.
IGMP Proxy	
IGMP Proxy	Switch the toggle to enable or disable the function. The application of multicast will be executed through WAN /PVC/VLAN port. In addition, such function is available in NAT mode.
Interface	Specify an interface for packets passing through.
Query Interval	Vigor router will periodically check which IP obtaining IPTV service by sending query. It might cause inconvenience for client. Therefore, set a suitable time (unit: second) as the query interval to limit the frequency of query sent by Vigor router.
IGMP encapsulation in PPPoE	It depends on the specifications regulated by each ISP. If you have no idea to enable or disable, simply contact your ISP providers.
IGMP Snooping	
IGMP Snooping	Select to enable IGMP Snooping so that multicast traffic will be forwarded to IGMP clients that have joined a multicast group.
IGMP Fast Leave	This option is shown only when IGMP Snooping is enabled. Select to enable IGMP Fast Leave. Normally when the router receives a "leave" message from an IGMP host, it will send a last member query message to see if there are still members within the multicast group. When Fast Leave is enabled, multicast for a group is immediately terminated when the last host in that group sends a "leave" message.
IGMP Accept List	Only the device with the IP address specified here is able to process the multicast traffic through the IGMP proxy.

	Any – All IP addresses are allowed for using the IGMP proxy. IP Object – Select the IP object(s). The data traffic through those IPs within the object will be processed through the IGMP proxy. IP Group - Select the IP group(s). The data traffic through those objects within the group will be processed through the IGMP proxy.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-11-2 IGMP Status

This page displays a list of active multicast groups.



Available settings are explained as follows:

Item	Description
Group Address	Address of the multicast group, which is within the IP range reserved for IGMP, 224.0.0.0 through 239.255.255.254.
Px	LAN ports that have IGMP hosts joined to this multicast group.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-12 Objects

Vigor router system provides the object functions.

Users can define various types of objects and groups, and then apply them at various scenarios, like Configuration>>NAT>> Port Forwarding, Security>>Firewall Filters.

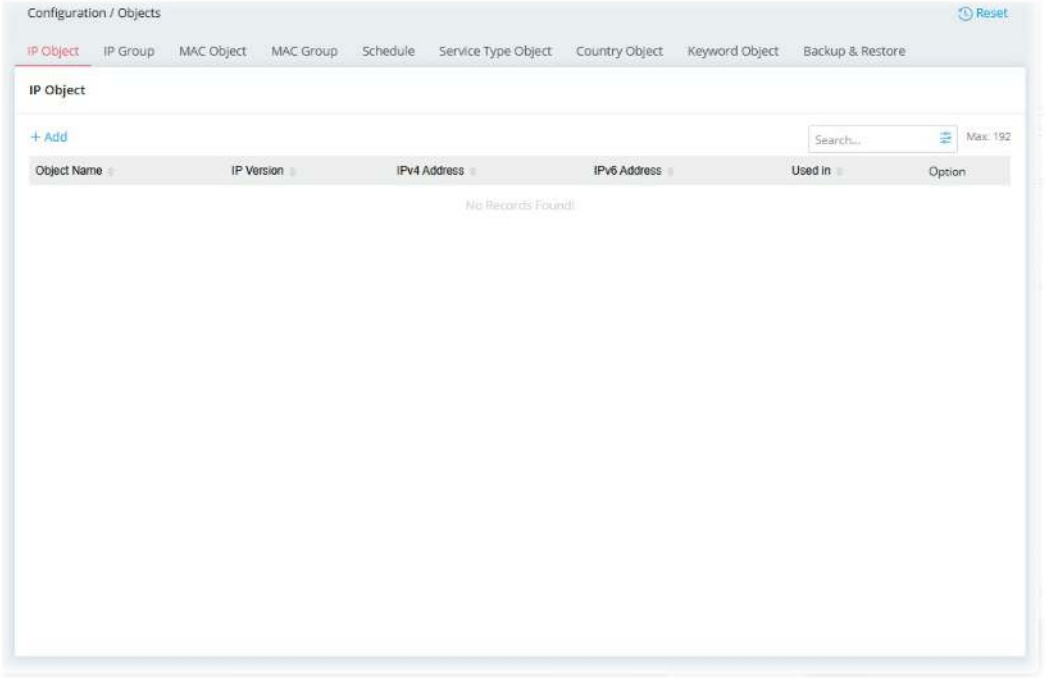
The advantage is that the user doesn't have to set data repetitively and it significantly enhances efficiency.

Currently, the objects that can be preset include IP, MAC, Schedule, Service Type, Keyword, and groups that include IP, MAC, etc.

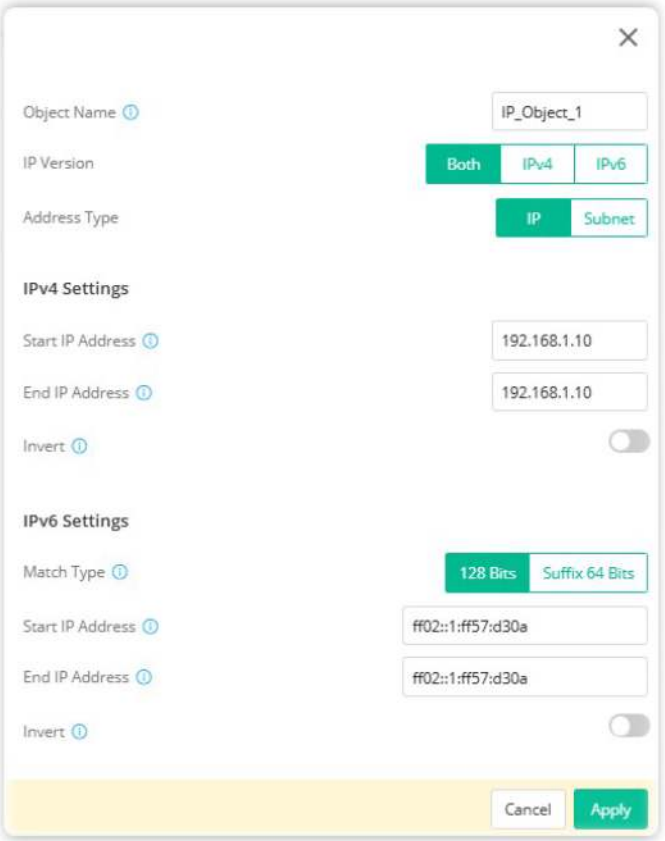
II-1-12-1 IP Object

For IPs in a range and service ports in a limited range usually will be applied in configuring router's settings, therefore we can define them with *objects* and bind the objects with *groups* for using conveniently. Later, we can select that object/group for applying it.

For example, a range of IP address in the same department can be defined with an IP object.



To add a new IP object profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

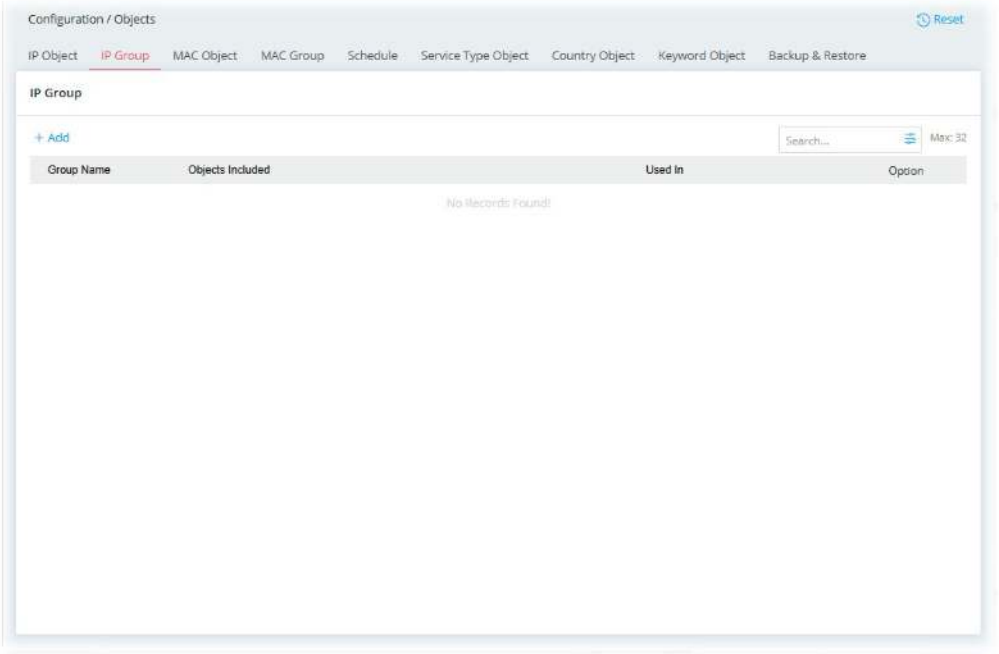
Item	Description
Object Name	Enter the name that identifies this profile.
IP Version	Select the IP version (IPv4, IPv6 or Both) for entering correct IP address.
Address Type	Select the type (IP or Subnet) of address.
	IPv4 Settings
Start IP Address	Enter the beginning IP address, if the Address Type is IP. To set a range of IP addresses, enter the different IP addresses as start IP address and end IP address.
End IP Address	Enter the ending IP address, if Address Type is IP.
IP Address	Enter an IP address if Address Type is Subnet.
Subnet Mask	Enter subnet mask, if Address Type is Subnet.
Invert	If enabled, all addresses except the ones entered above will be used.
	IPv6 Settings
Match Type	Specify the match type (128 Bits or Suffix 64 Bits) for the IPv6 address.
Start IP Address	Enter the beginning IPv6 address, if the Address Type is IP. To set a range of IP addresses, enter the different IP addresses as start IP address and end IPv6 address.
End IP Address	Enter the ending IPv6 address, if Address Type is IP.
IP Address	Enter an IPv6 address if Address Type is Subnet.

Prefix Length	Enter IPv6 prefix length, if Address type is Subnet.
Invert	If enabled, all addresses except the ones entered above will be used.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

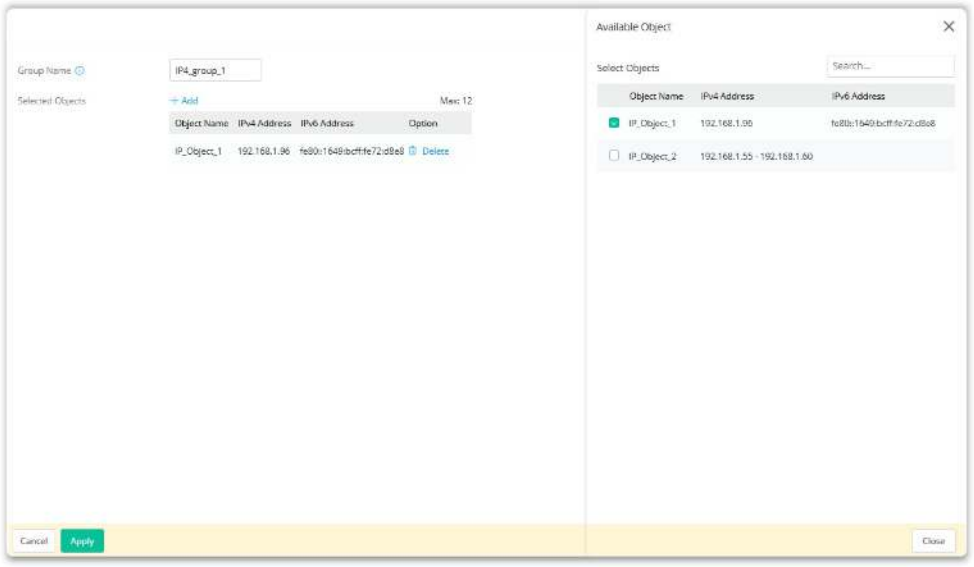
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-12-2 IP Group

Multiple IPv4 Objects /IPv6 Objects can be placed into an IPv4 Group / IPv6 Group.



To add a new IP group profile, click the **+Add** link to get the following page.

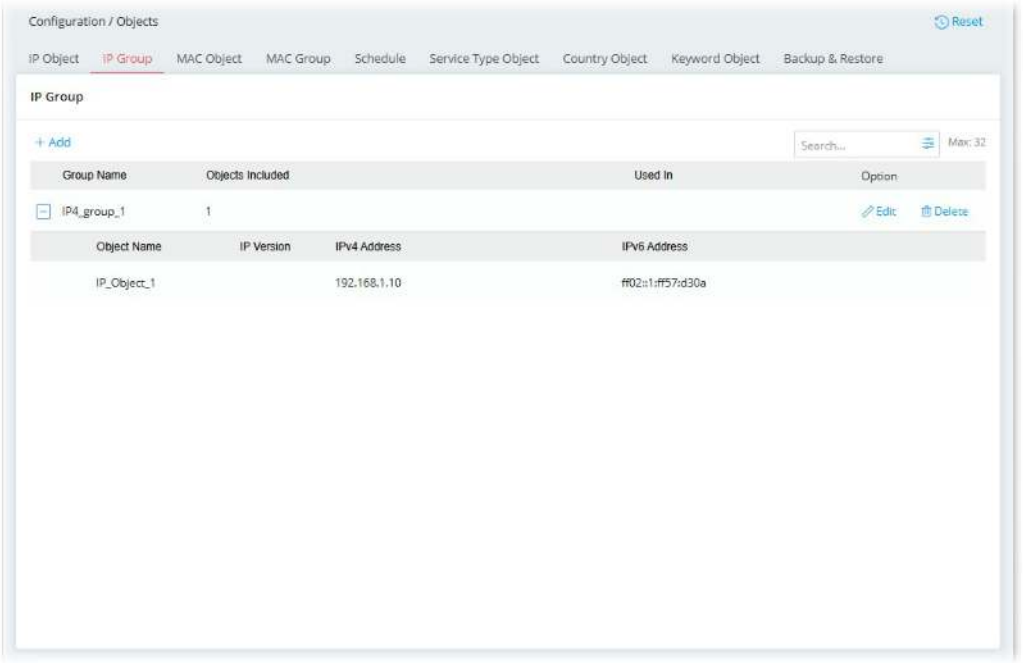


Available settings are explained as follows:

Item	Description

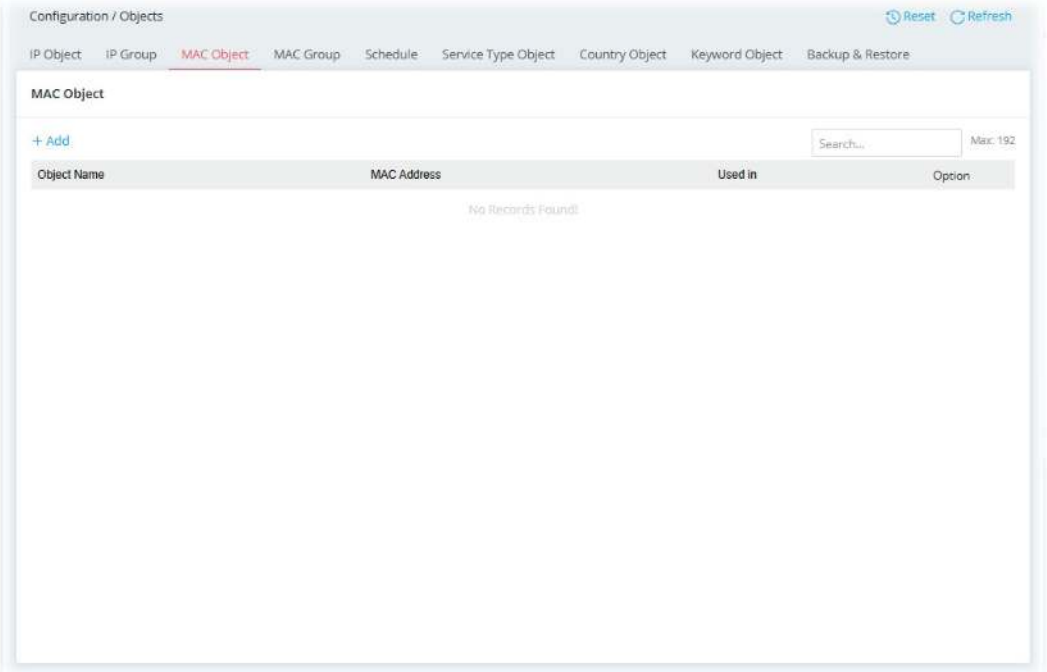
Group Name	Enter a name that identifies this profile.
Selected Objects	+Add - Click to open the page with available objects.
	Available Object
Search	Enter the IP object name or the IPv4/IPv6 Address to search related IP object(s).
Selected Objects	Objects available for grouping will be displayed here. Select one or more objects to group under the current IP group.
Object Name	Display current existed IPv4/IPv6 object(s). To add an IP object to the current IP group, simply select the object(s) you want. The selected items will then appear under the Selected Objects section on the left side.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.



II-1-12-3 MAC Object

The MAC address of local or remote clients can be specified in the MAC Object page.



To add a new MAC object profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

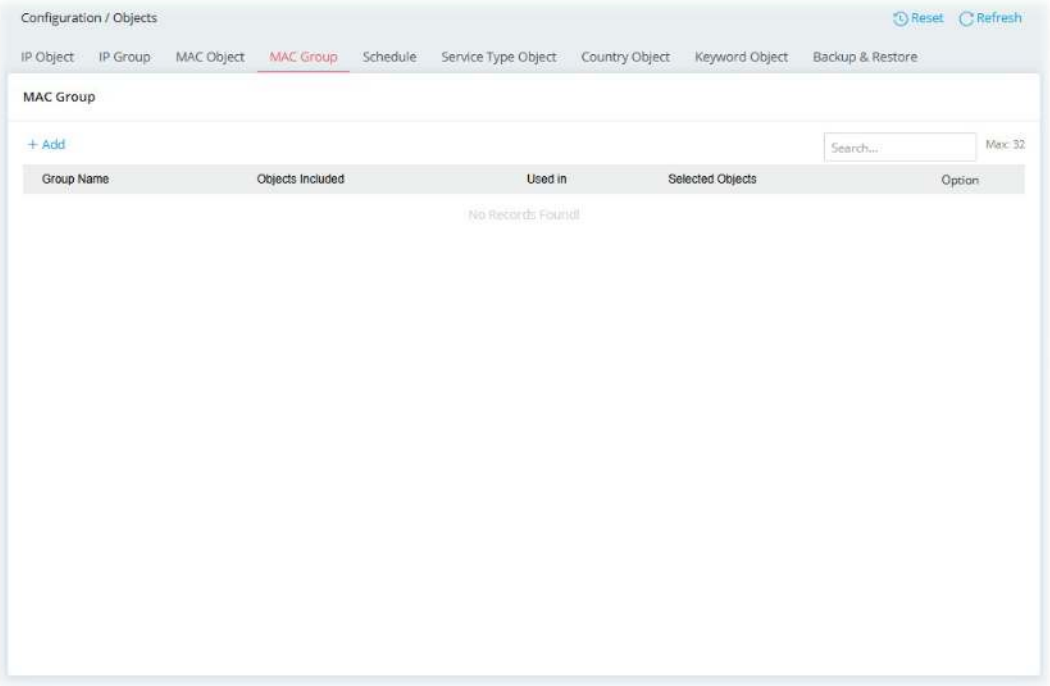
Item	Description

Object Name	Enter a name that identifies this object.
MAC Address	Enter the MAC address of the client.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

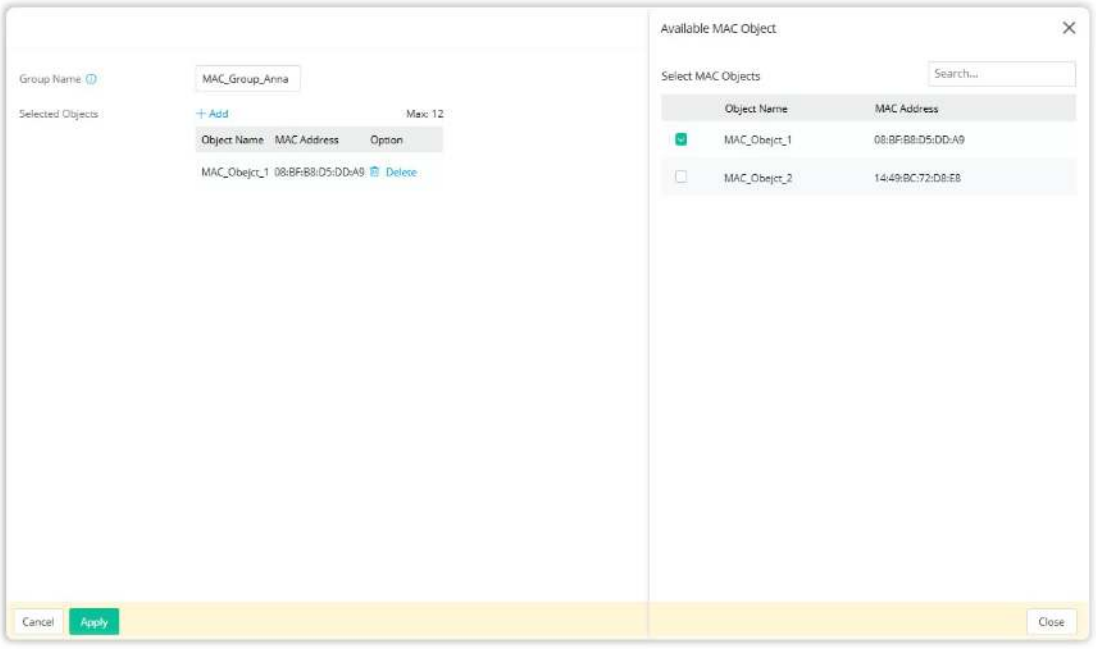
After finishing this web page configuration, please click Apply to save the settings.

II-1-12-4 MAC Group

Multiple MAC Objects can be placed into a MAC Group.



To add a new MAC group profile, click the +Add link to get the following page.



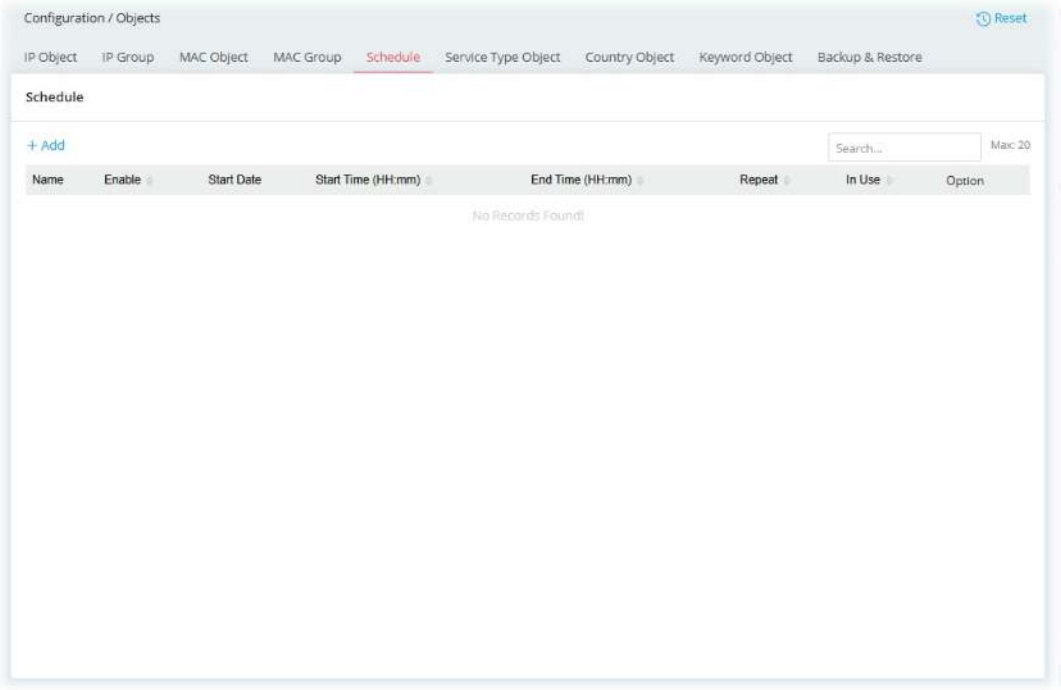
Available settings are explained as follows:

Item	Description
Group Name	Enter a name that identifies this profile.
Selected Objects	+Add - Click to open the page with available objects.
	Available MAC Object
Select MAC Objects	Search - Enter the MAC object name to display existed MAC objects.
Object Name	Select the object(s) to be grouped under the current MAC group. The selected one will be shown under the Selected Objects on the left side.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

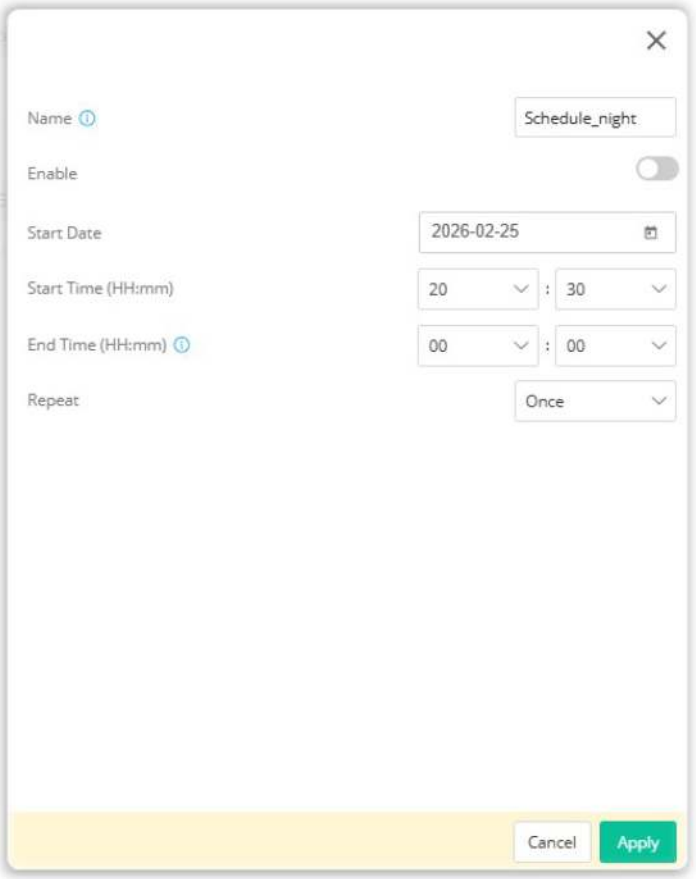
After finishing this web page configuration, please click Apply to save the settings.

II-1-12-5 Schedule

Time schedules can be created and used with router features that support them, so that those features can be turned on and off automatically at preconfigured times.



To add a new schedule profile, click the +Add link to get the following page.



Available settings are explained as follows:

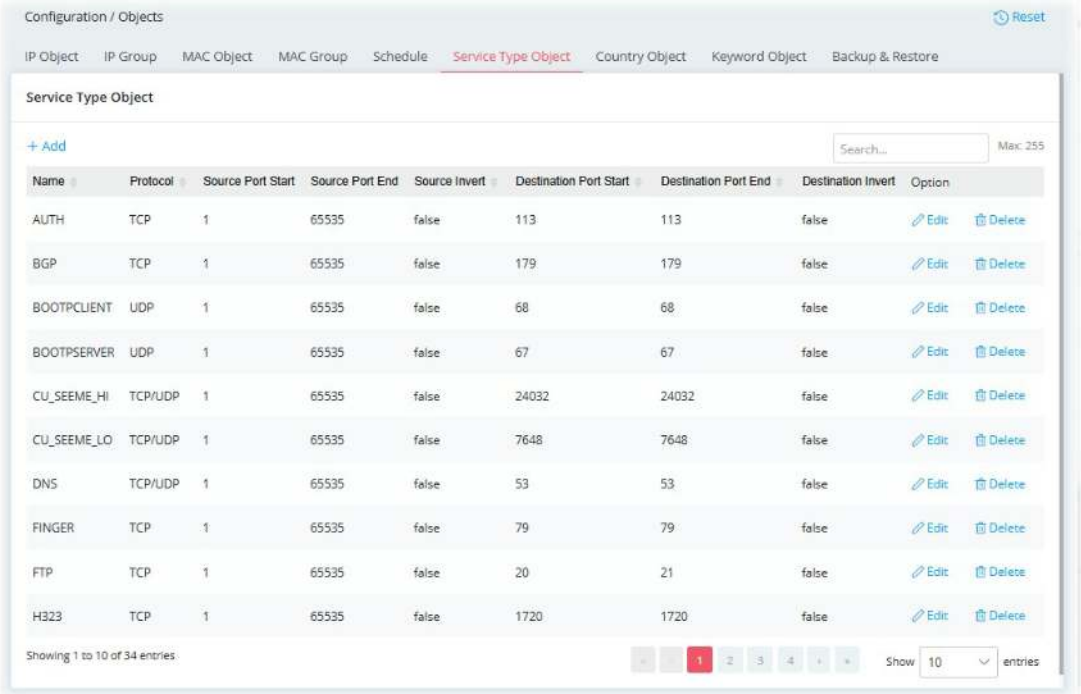
Item	Description
Name	Enter the name of the schedule profile.
Enabled	Switch the toggle to enable or disable this schedule profile.
Start Date	Select the date when the entry comes into effect.
Start Time	Set the time when the schedule is triggered.
End Time	Set the time for the schedule to be ended.
Repeat	Once - The schedule is triggered once based on Date, Start Time and End Time. Daily - The schedule is triggered everyday based on Start Time and End Time. ● End Repeat - If enabled, the schedule will be triggered every day till the date defined in the End Repeat Date. ● End Repeat Date - The schedule will be ended on the specified date. Weekly - The schedule will be triggered, starting at the Start Time and ending at the End Time, on the selected days of the week. ● Every - Select the day for triggering the schedule. ● End Repeat - If enabled, the schedule will be triggered every week till the date defined in the End Repeat Date.. ● End Repeat Date - The schedule will be ended on the specified date. Monthly - The schedule will be triggered monthly based on the Date setting. For example, choose 2022-04-27 as the date set. Later, this schedule will be triggered on the 27th of every month.

	• **End Repeat** - If enabled, the schedule will be triggered every month till the date defined in the End Repeat Date. • **End Repeat Date** - The schedule will be ended on the specified date.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

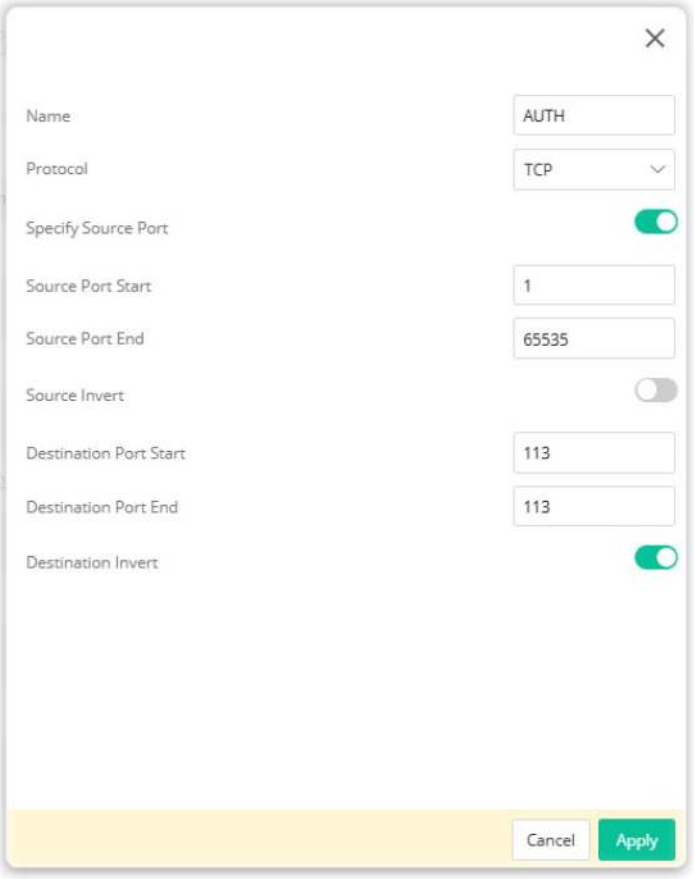
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-12-6 Service Type Object

Up to 255 Service Type Objects can be created.



To add/edit a service type profile, click the +Add / Edit link to get the following page.



Available settings are explained as follows:

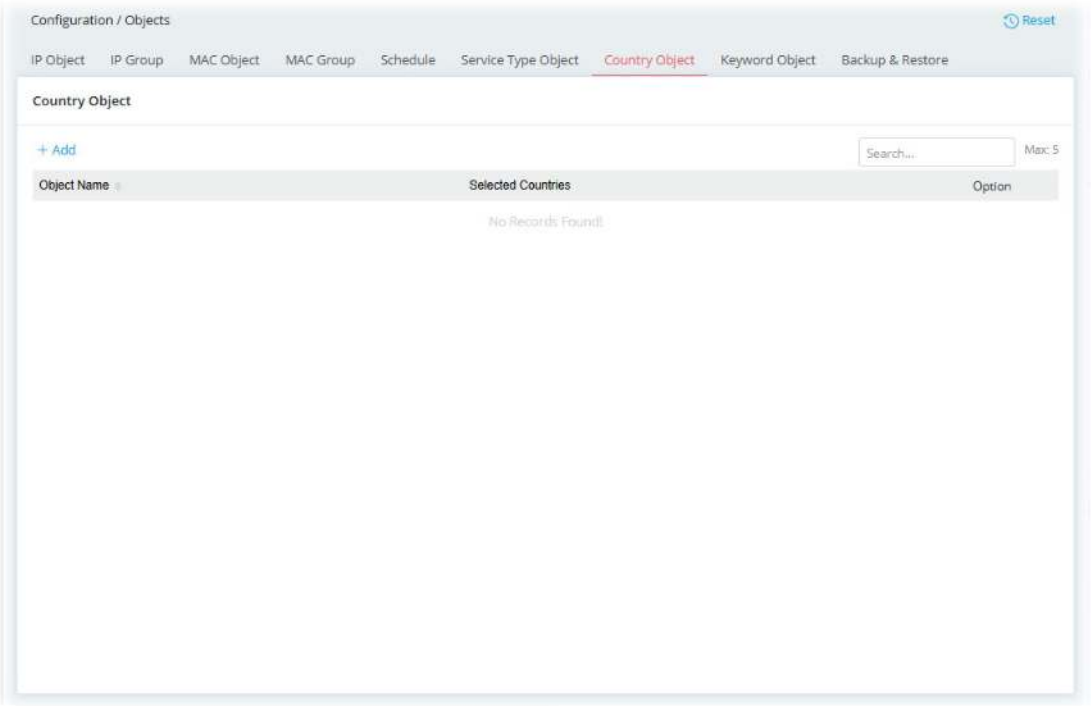
Item	Description
Name	Name that identifies this profile. Maximum length is 15 characters.
Protocol	Protocol(s) to which this profile applies. Any – All protocols. ICMP / ICMPv6 – Internet Control Message Protocol IGMP – Internet Group Management Protocol TCP – Transmission Control Protocol UDP – User Datagram Protocol TCP/UDP – Transmission Control Protocol and User Datagram Protocol Other – Other protocols not listed above. Enter protocol number in the textbox.
Specify Source Port	When protocol selected includes TCP or UDP, the source and destination ports can be specified. Switch the toggle to enable/disable the source port settings. Source Port Start / Source Port End – Enter two values to define the port range of source port. Source Invert - If enabled, all port values except the ones entered above (Source Port Start/End) will be used.
Destination Port Start / Destination Port End	When protocol selected includes TCP or UDP, the source and destination ports can be specified.
Destination Invert	If enabled, all port values except the ones entered above (Destination Port Start/End) will be used.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

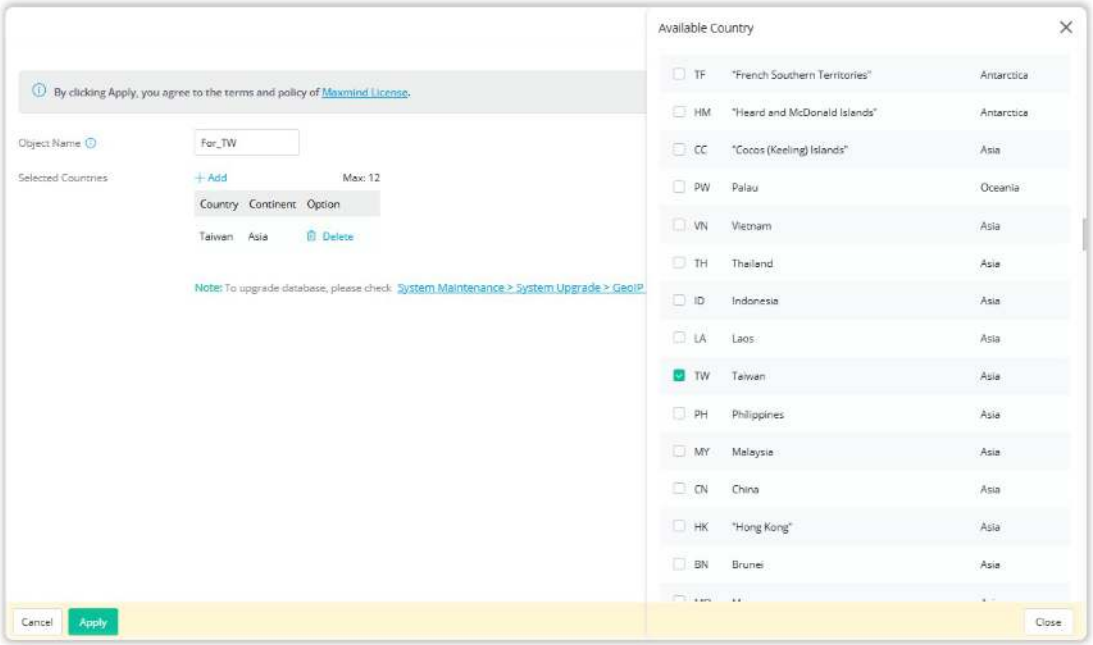
II-1-12-7 Country Object

The country object profile can determine which country/countries shall be blocked by the Vigor router's Firewall.

Up to 5 country object profiles can be created for use as blacklists or white lists.



To add a country object profile, click the +Add link to get the following page.



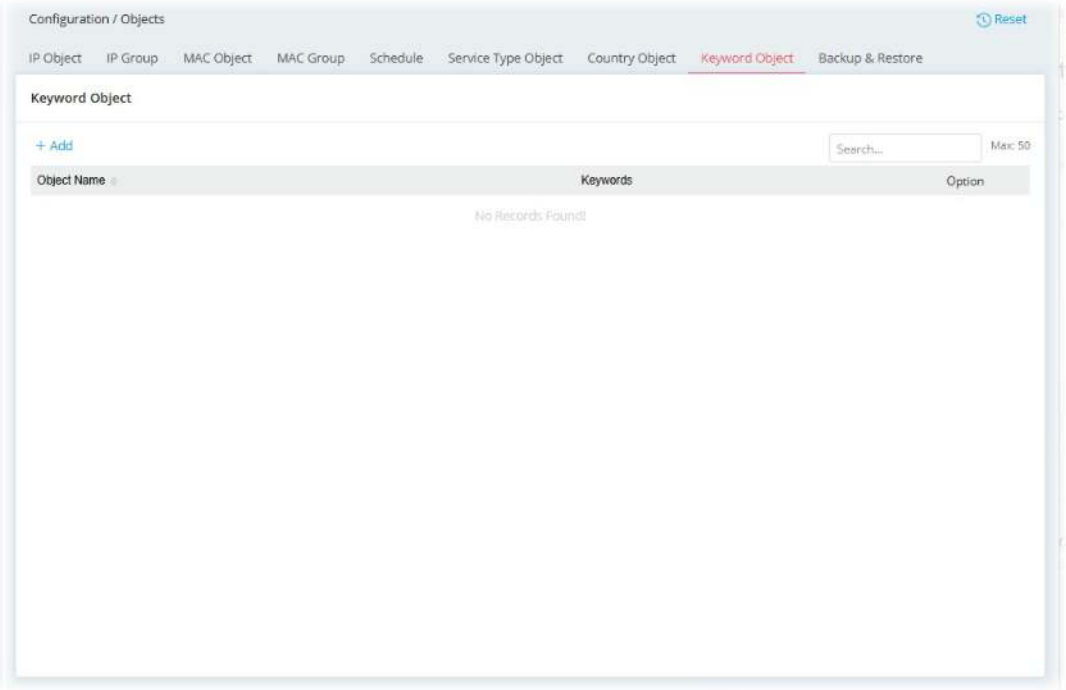
Available settings are explained as follows:

Item	Description
Object Name	Name that identifies this profile. Maximum length is 63 characters.
Selected Countries	+Add - Click to create an entry. A list of country codes will appear on the right side. Select up to 12 required codes for the new object.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

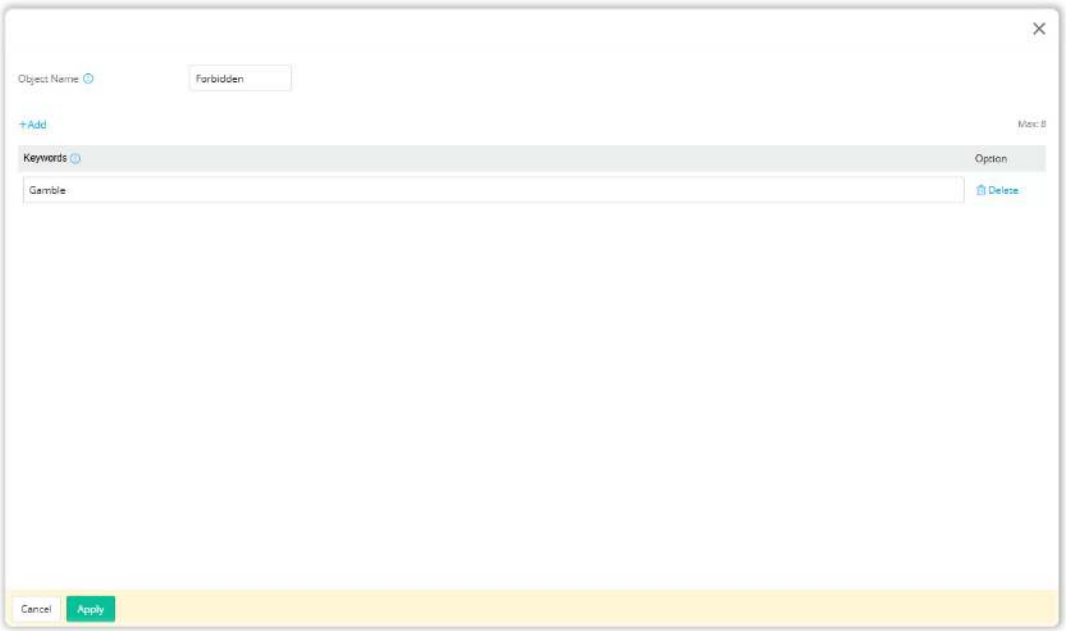
After finishing this web page configuration, please click Apply to save the settings.

II-1-12-8 Keyword Object

50 Keyword Object Profiles can be created for use as blacklists or white lists.



To add a keyword object profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

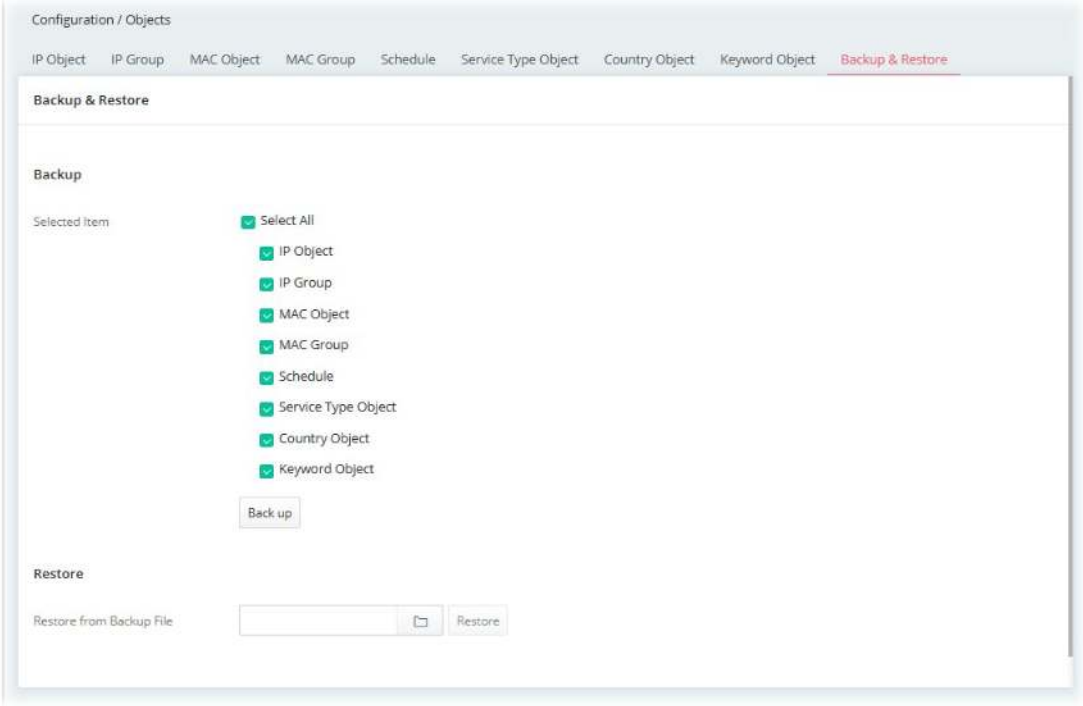
Item	Description
Object Name	Name that identifies this profile. Maximum length is 16 characters.
Keywords	Keywords to be matched. Enter the content for this profile. For example, type *gambling* as Contents. When you browse the webpage, the page with gambling information will be watched out and be passed/blocked based on the configuration on Firewall settings.

	In addition, up to 3 key phrases, separated by spaces, for a total length of 63 characters can be entered. For key phrases that contain spaces, replace spaces with the sequence %20. For example, the phrase “keep out” is to be entered as “keep%20out”.
Delete	Click to remove the selected entry.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-12-9 Backup & Restore

The object settings can be backed up as a file. The backup file can be imported to the device to restore the configuration in the future if required.



Available settings are explained as follows:

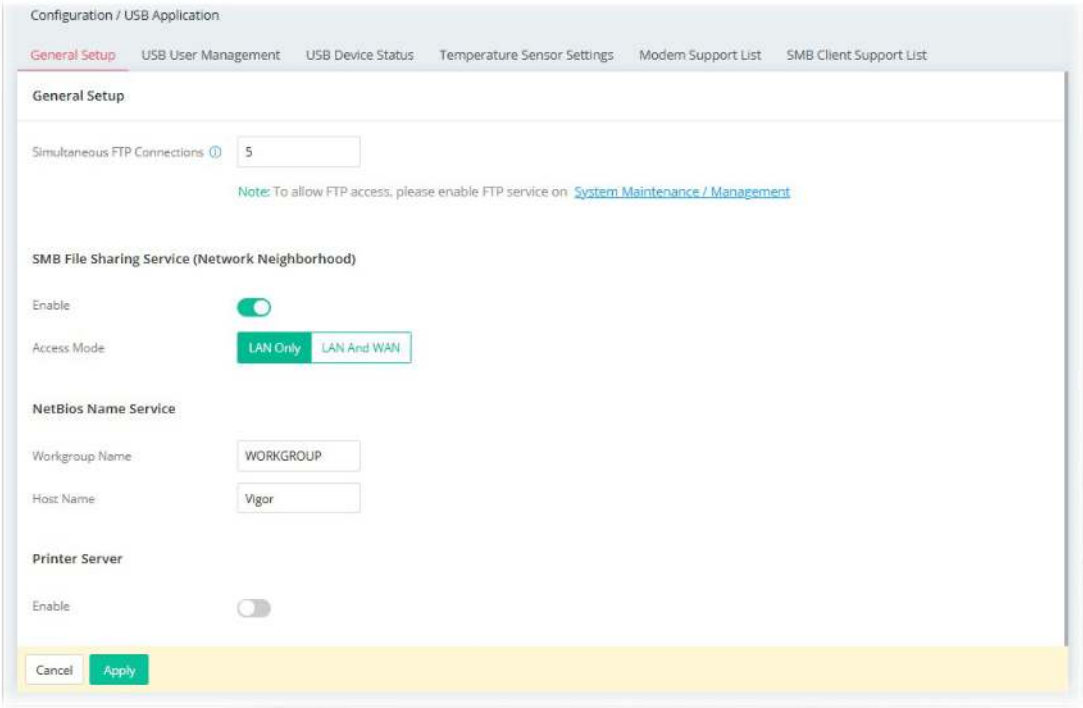
Item	Description
Backup	Usually, a user can create the objects through the web page under Objects. All the objects (or the template) can be saved and exported as a file by clicking Download. Back up – Click it to backup current objects to a file. Such file can be restored for future use.
Restore	Restore from Backup File – Click it to specify a file backed up previously. Restore – Click to execute the restoration.

After finishing this web page configuration, please click Apply to save the settings.

II-1-13 USB Application

II-1-13-1 General Setup

This page allows you to configure the file sharing feature of the Vigor router, where USB mass storage devices such as thumb drives and hard drives can be made accessible to LAN clients.



Available settings are explained as follows:

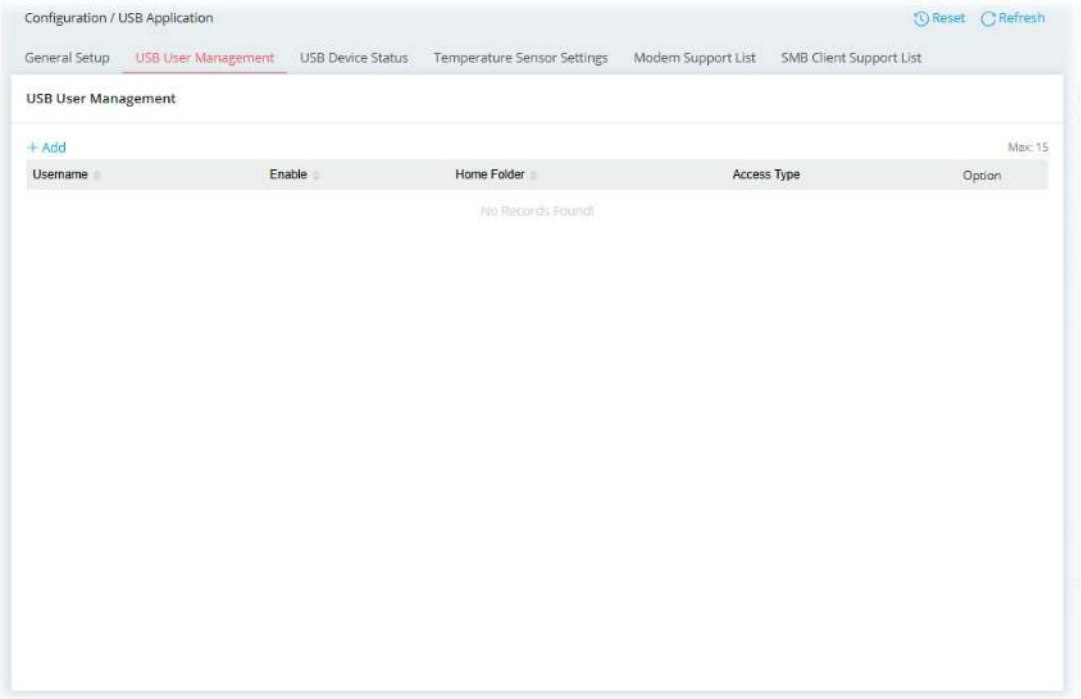
Item	Description
Simultaneous FTP Connections	Enter the maximum number of simultaneous FTP sessions allowed. The router allows up to 6 simultaneous sessions.
SMB File Sharing Service (Network Neighborhood)	Click **Enabled** to invoke SMB file sharing service via the router. Access Mode – Select the access mode for file sharing service. • LAN Only – Users coming from internet cannot connect to the SMB server of the router. • LAN And WAN - Both LAN and WAN users can access SMB server of the router.
NetBios Name Service	For the NetBios service of USB storage disk, you have to specify a workgroup name and a host name. A workgroup name must not be the same as the host name. The workgroup name can have as many as 15 characters and the host name can have as many as 23 characters. Both them cannot contain any of the following--- ; : " < > * + = \ | ?. Workgroup Name – Type a name for the workgroup. Host Name – Type the host name for the router.
Printer Server	Switch the toggle to enable/disable the printer server. If enabled, the Vigor router will act as a print server for printers connected the USB.
Cancel	Discard current settings.

Apply	Save the current settings.

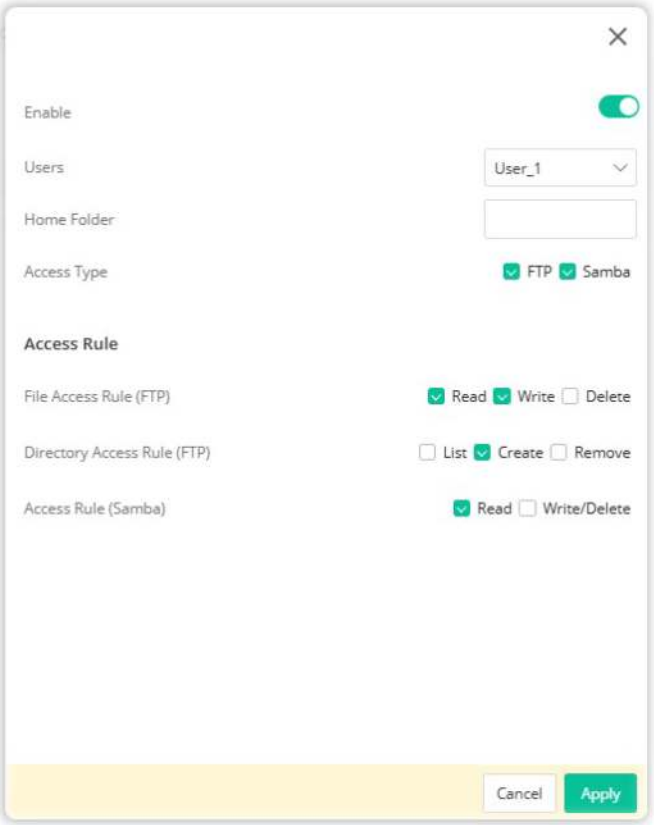
After finishing this web page configuration, please click **Apply** to save the settings.

II-1-13-2 USB User Management

This page allows you to set up profiles for FTP/SMB users. Any user who wants to access the USB storage disk must authenticate using a username and password that have been configured on this page.



To add a USB user profile, click the **+Add** link to get the following page.



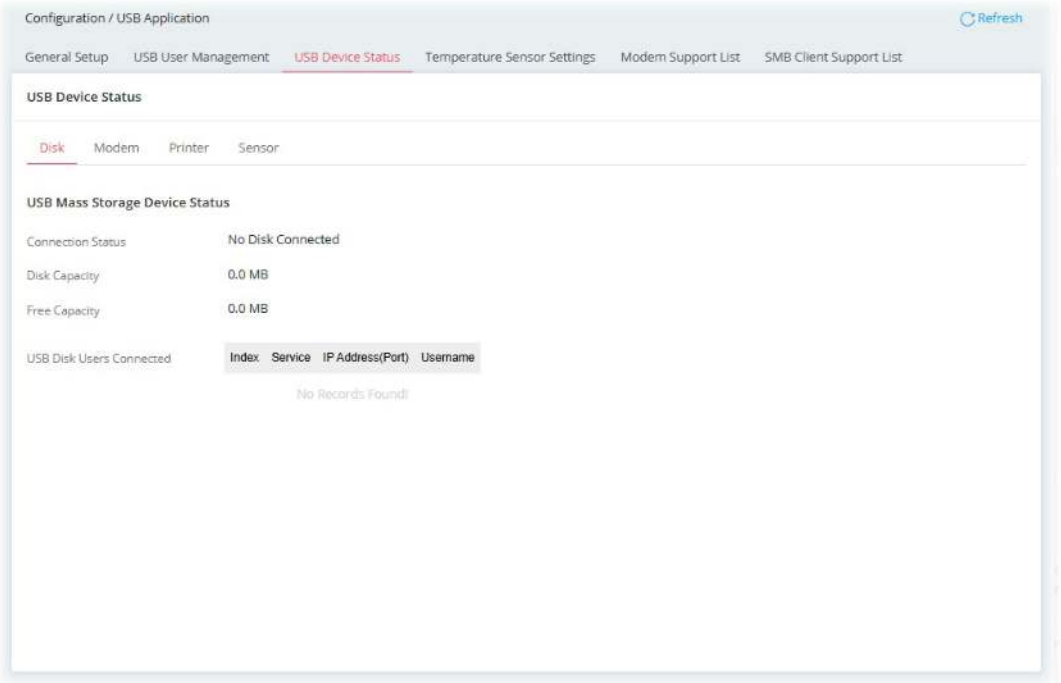
Available settings are explained as follows:

Item	Description
Enable	Switch the toggle to enable / disable this profile.
Users	Use the drop-down list to select an existing user account (created in IAM>>Users & Groups>>Users).
Home Folder	Enter the folder name which will be the root folder for FTP and SMB sessions established using the credentials of this user profile. Only folders and files inside this selected root folder are accessible to the user.
Access Type	FTP - It allows you to access and control a remote PC through FTP service. Samba - It allows you to access and control a remote PC through Samba service.
Access Rule	It determines the authority for such profile. Any user, who uses such profile for accessing into USB storage disk, must follow the rule specified here. File Access Rule (FTP) – Check the items (Read, Write and Delete) for such profile. Directory Access Rule (FTP) – Check the items (List, Create and Remove) for such profile. Access Rule (Samba) – Check the items (Read, Write/Delete) for such profile.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-13-3 USB Device Status

This page allows monitoring of the status of USB devices (disk, modem, printer, and sensor) connected to the Vigor router.



Available settings are explained as follows:

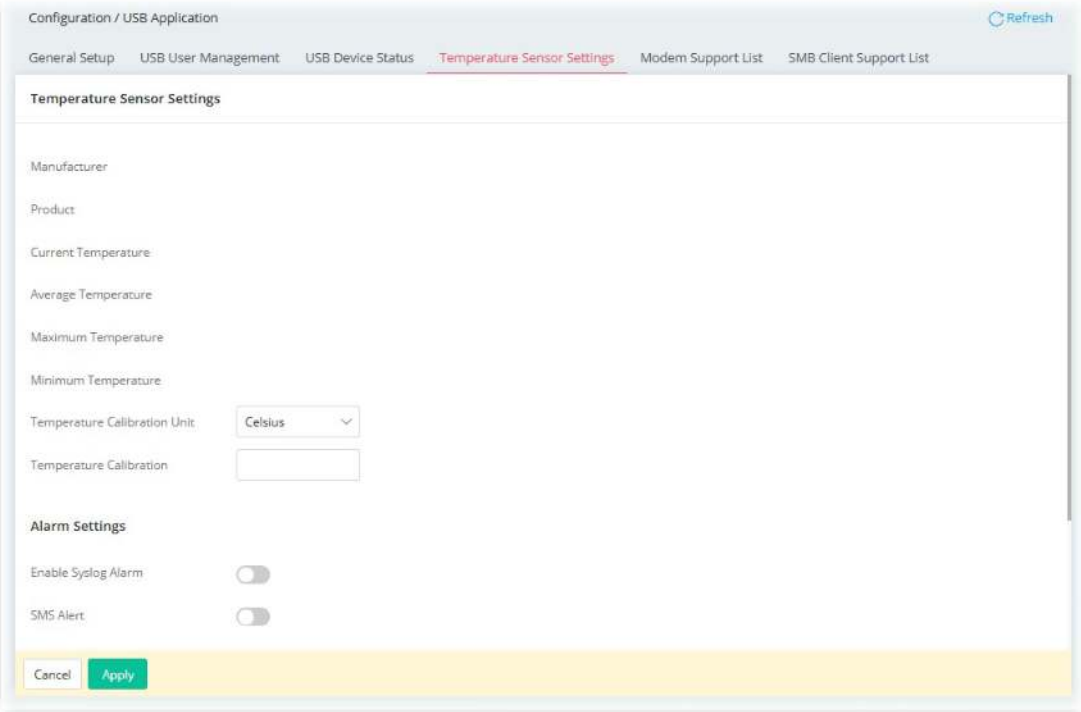
Item	Description
Connection Status	Shows whether a USB disk is connected or not. If there is no USB device connected to the Vigor router, "No Disk Connected" will be displayed.
Disk Capacity	Shows the total capacity of the USB storage disk.
Free Capacity	Shows the free space on the USB storage disk. Click **Refresh** at any time to get the most up-to-date free capacity.
USB Disk Users Connected	Shows the clients that are connected to the SMB/FTP server. **Index** – The profile index used by the client to establish the connection. **Service** – Shows whether the connection is using FTP or SMB. **IP Address** – Shows the client's IP address. **Username** – Shows the username used to establish the connection.

II-1-13-4 Temperature Sensor Settings

A USB Thermometer is now available. It complements your installed DrayTek router installations which will help you monitor the server or data communications room environment and notify you if the server room or data communications room is overheating.

During summer in particular, it is important to ensure that your server or data communications equipment are not overheating due to cooling system failures.

The inclusion of a USB thermometer in compatible Vigor routers will continuously monitor the temperature of its environment. When a pre-determined threshold is reached you will be alerted by either an email or SMS so you can undertake appropriate action.



Available settings are explained as follows:

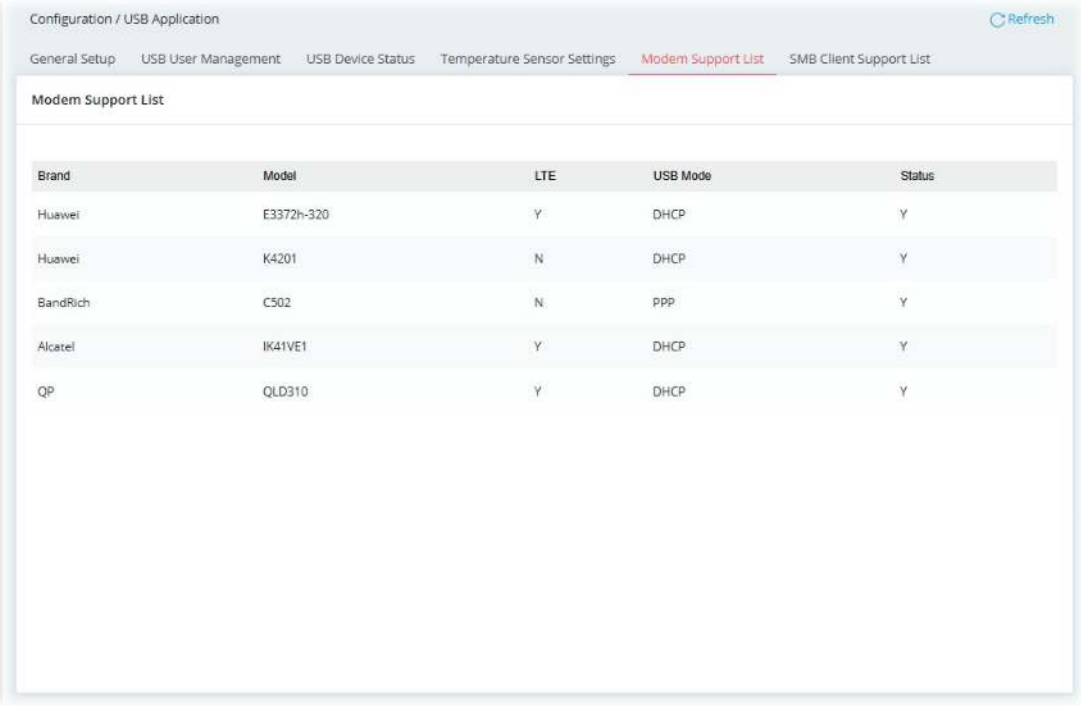
Item	Description
Temperature Sensor Settings	Display information related to manufacturer, product, current temperature, average temperature, maximum temperature, and minimum temperature. Temperature Calibration Unit - Select the temperature scale to be used. Temperature Calibration – Enter the difference between the actual temperature and the temperature as reported by the thermometer.
Alarm Settings	Enable Syslog Alarm – Select to enable recording of the temperature in Syslog. SMS Alert – Switch the toggle to enable/disable the SMS alert. • Send Alert SMS to – Select the SMS sender profile (created on IAM>>Users & Groups>>Users, System Maintenance>>Account & Permission>>Local Admin Account). Email Alert –Switch the toggle to enable/disable the email alert. • Send Alert Email to –Select the email sender profile (created on IAM>>Users & Groups>>Users, System Maintenance>>Account & Permission>>Local Admin Account).

	Lower temperature limit / Upper temperature limit– Enter the upper and lower temperature limits. If the temperature falls outside of this range, an alert will be sent.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-1-13-5 Modem Support List

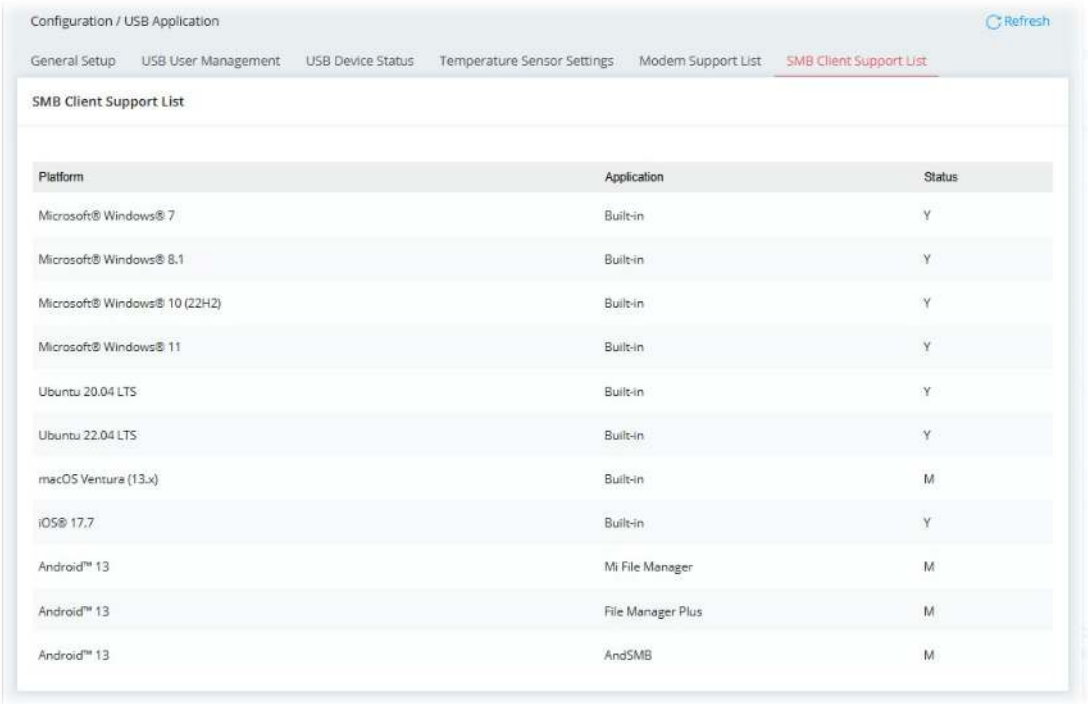
This page lists the brands and models of USB modems that are supported by the Vigor router.

It is subject to change between different versions of firmware as support for new modems are added.



II-1-13-6 SMB Client Support List

The SMB Client Support List provides the test status information for applications with file sharing operated under different platforms.

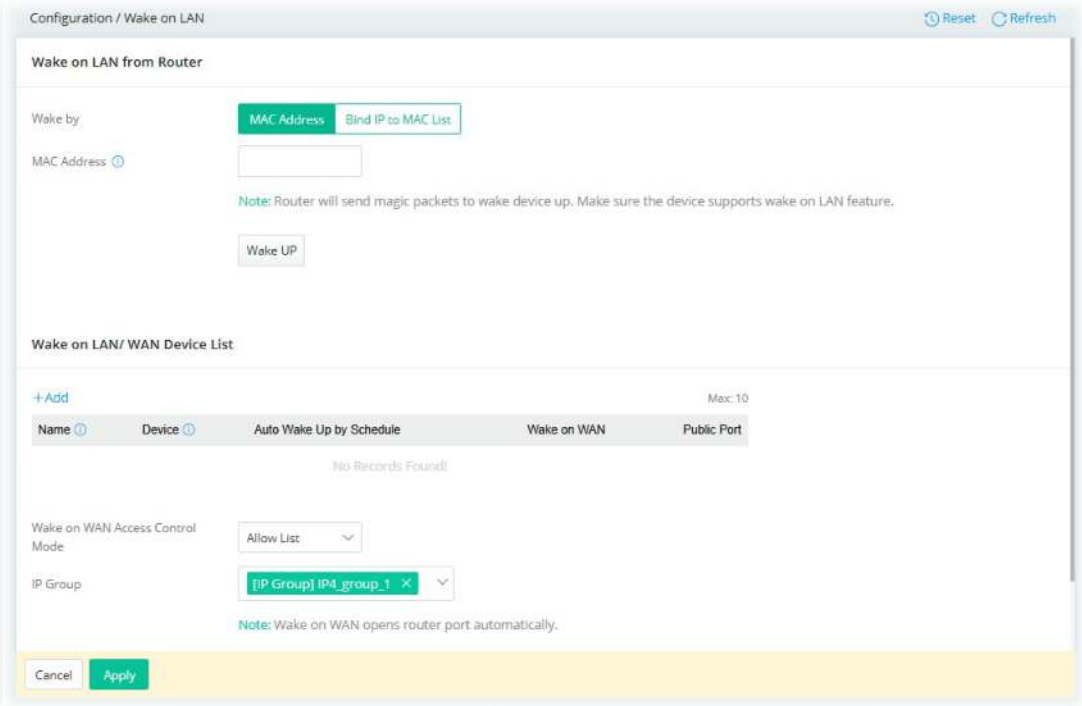

Configuration / USB Application
Refresh
General Setup
USB User Management
USB Device Status
Temperature Sensor Settings
Modem Support List
SMB Client Support List
SMB Client Support List
Platform
Application
Status
Microsoft® Windows® 7
Built-in
Y
Microsoft® Windows® 8.1
Built-in
Y
Microsoft® Windows® 10 (22H2)
Built-in
Y
Microsoft® Windows® 11
Built-in
Y
Ubuntu 20.04 LTS
Built-in
Y
Ubuntu 22.04 LTS
Built-in
Y
macOS Ventura (13.x)
Built-in
M
iOS® 17.7
Built-in
Y
Android™ 13
Mi File Manager
M
Android™ 13
File Manager Plus
M
Android™ 13
AndSMB
M

II-1-14 Wake on LAN

Using the Wake on LAN (WoL) feature, LAN clients that support WoL can be powered on or resume from sleep over the network, without the need for physical access to the device.

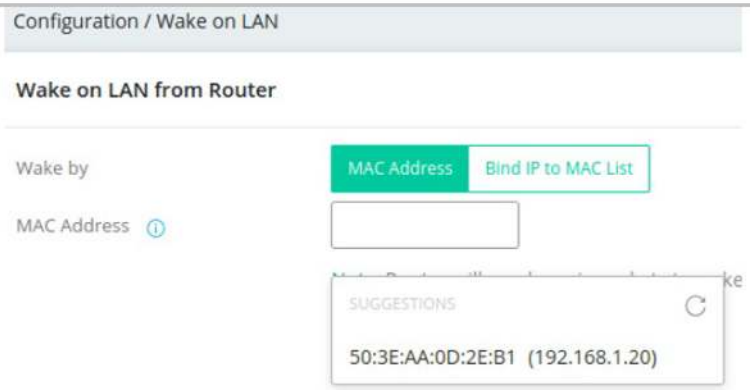
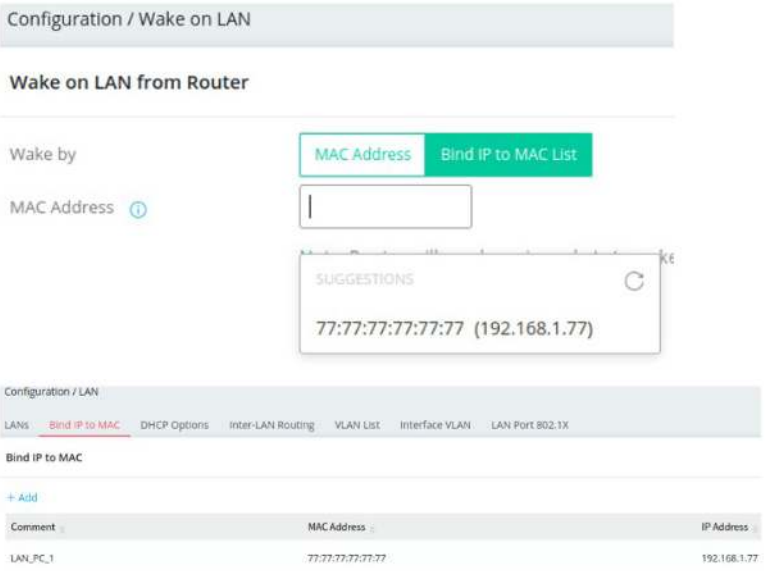
In order for LAN clients to be able to wake from sleep or off states, the network interface card must be configured to monitor Wake-on-LAN messages. Consult the documentation of the LAN client for details on setting up its network interface for Wake on LAN.

If you wish to be able to select the IP address of the Wake-on-LAN client, its MAC address must first be bound to a static IP address using the Bind IP to MAC function.



Available settings are explained as follows:

Item	Description
	Wake on LAN from Router
Wake by	The type of address of the LAN client to be woken up. ● MAC Address ● Bind IP to MAC List
MAC Address	The MAC address provided here will be the device that the Vigor router will wake up. If MAC Address is selected in Wake by, the content listed on ARP Table will be shown for you to choose.

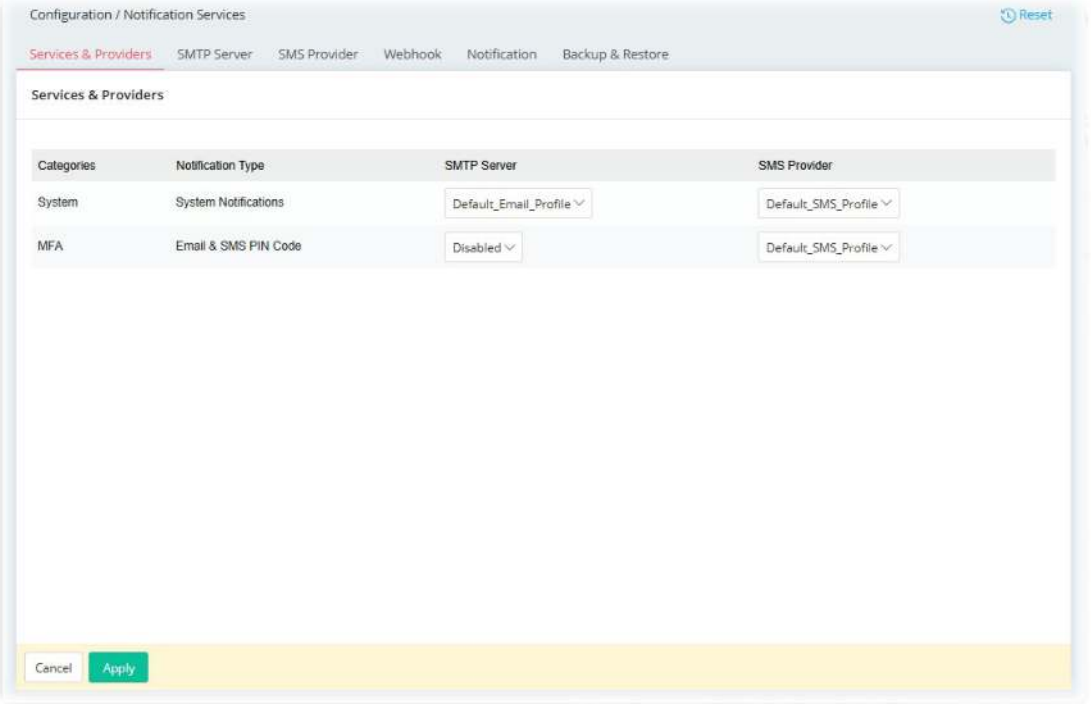
	 If Bind IP to MAC List is selected in Wake by, the profile content listed on Configuration>>LAN>>Bind IP to MAC will be shown for you to choose one. 
Wake Up	Click to send Wake-on-LAN message to the specified LAN client.
	Wake on LAN/WAN Device List
+Add	Click to specify a new device which will be awakened. Name – Enter the name of the device. Device – Enter the MAC address of the device. Auto Wake Up by Schedule – The device can be awakened based on the schedule automatically. Wake on WAN – Switch the toggle to enable / disable this function. The device can be awakened by the IPs selected on the Allow List. Public Port – Set a port number. Option (Delete) – Remove the selected device.
Wake on WAN Access Control Mode	Set the path for the boot packet (sent by a mobile phone) to deliver to the remote device. Allow List – The boot packets will be transferred to the remote device via any WAN IP or the IP listed on the IP group. IP Group - Select the IP group.
Cancel	Discard current settings.
Apply	Save the current settings.

II-1-15 Notification Services

Generally, the notification service refers to notifying users via email or SMS.

II-1-15-1 Services & Providers

Before notifying the clients, the router's system administrator needs to configure the server and provider used to send letters or SMS messages.



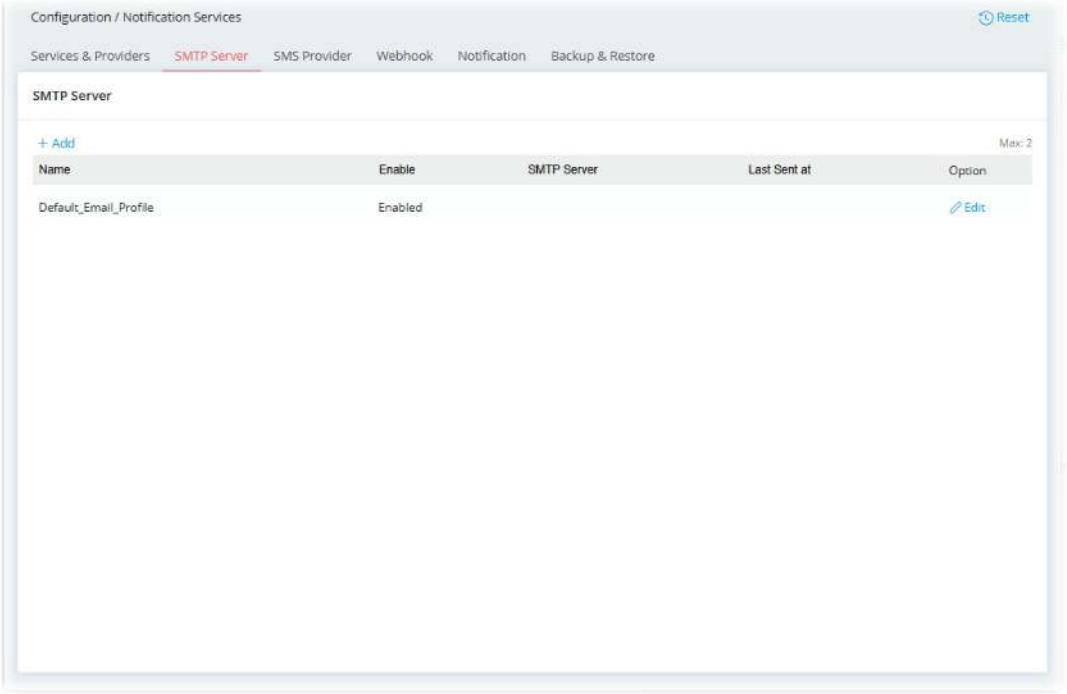
Available settings are explained as follows:

Item	Description
SMTP Server	Use the drop-down menu to select the SMTP server for sending the e-mail.
SMS Provider	Use the drop-down menu to select the SMS Provider for sending the SMS.
Cancel	Discard current settings.
Apply	Save the current settings.

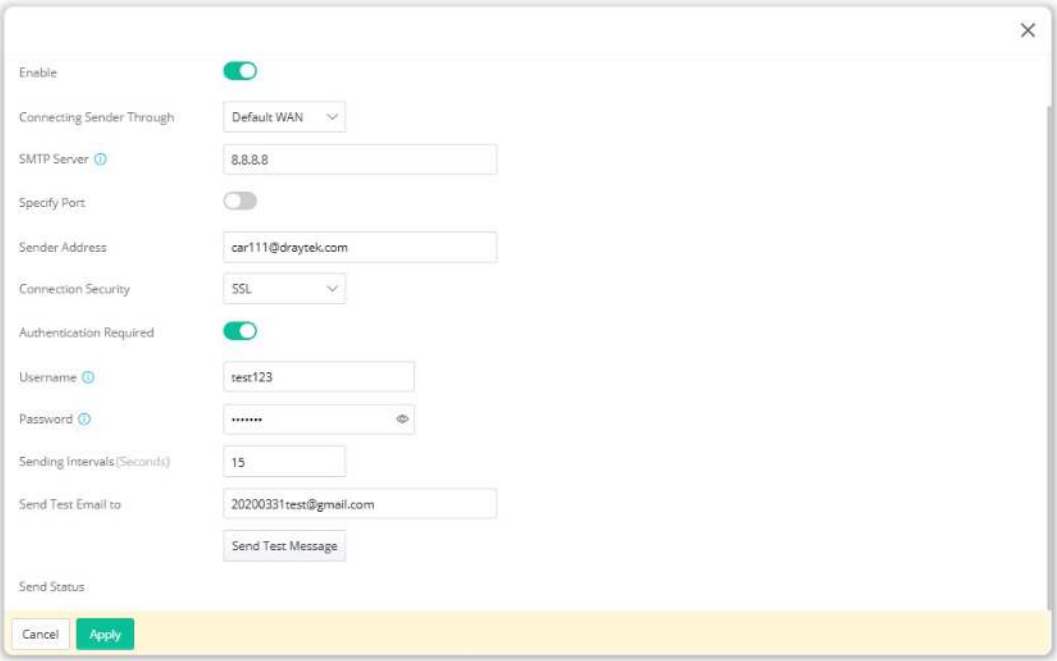
After finishing this web page configuration, please click Apply to save the settings.

II-1-15-2 SMTP Server

Up to 2 SMTP server profiles can be set up for chosen by Services & Providers.



To add a new profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

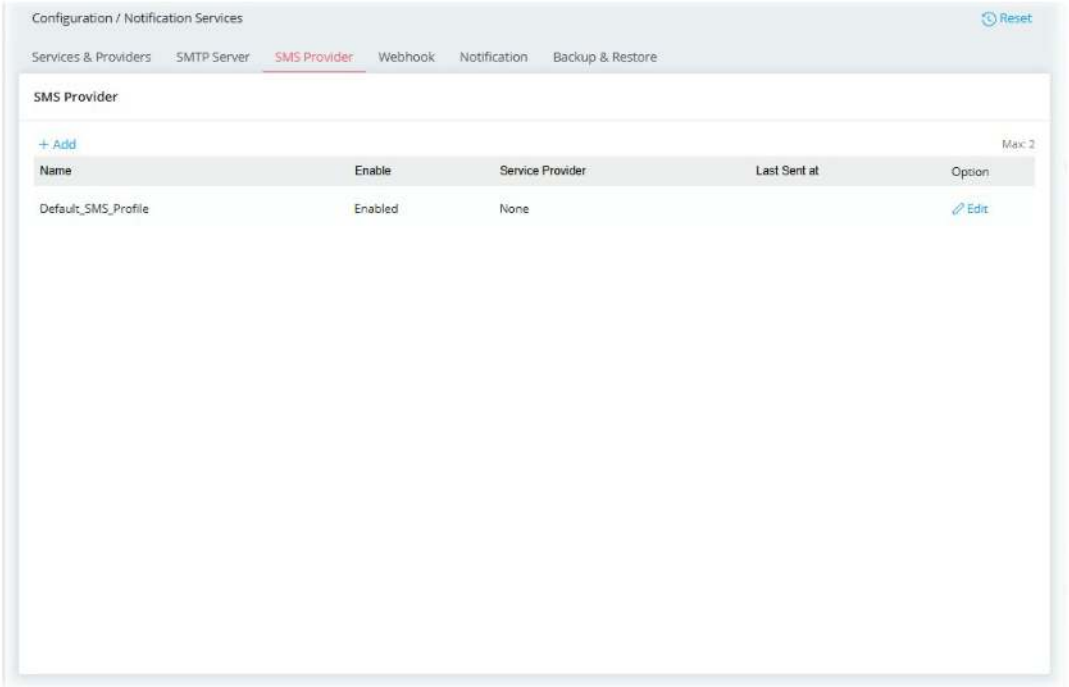
Item	Description
Name	Enter the name of the profile.
Enable	Switch the toggle to enable/disable this profile.
Connecting Sender Through	Specify the WAN interface for connecting the sender.

SMTP Server	Enter the IP address of the SMTP server.
Specify Port	Switch the toggle to enable the port setting. Specify SMTP Port – Enter the port number of the SMTP server.
Sender Address	Enter the E-mail address of the sender.
Connection Security	There are three methods to enhance the connection security of SMTP server. None - No SSL. Packets will be transferred without encryption. SSL - Packets will be transferred with encrypted connection. Select to use SMTPS (SMTP over SSL) to communicate with the SMTP server. Note that the port number used for SMTPS server is 465. StartTLS - It is a protocol used in communication to initiate a transition from an insecure one to a secure channel.
Authentication Required	Select to send username and password to SMTP server for authentication. Username – Username for authentication. Maximum length is 31 characters. Password – Password for authentication. Maximum length is 31 characters.
Sending Intervals	Minimum amount of time, in seconds, to wait between sending e-mail messages.
Send Test Email to	Specify an email address. Send Test Message - Click it to send a test e-mail according to above configuration.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

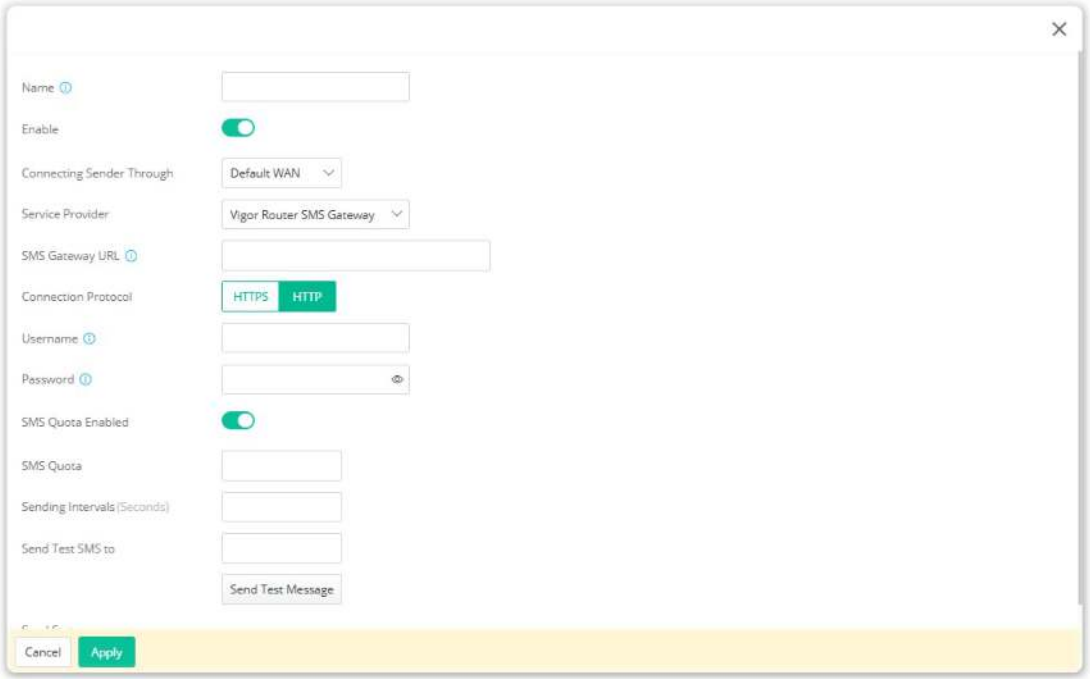
After finishing this web page configuration, please click Apply to save the settings.

II-1-15-3 SMS Provider

Up to 2 SMS profiles can be set up as the SMS Providers.



To add a new profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter the name of the profile.
Enable	Switch the toggle to enable/disable this profile.
Connecting Sender	Specify the WAN interface for connecting the sender.

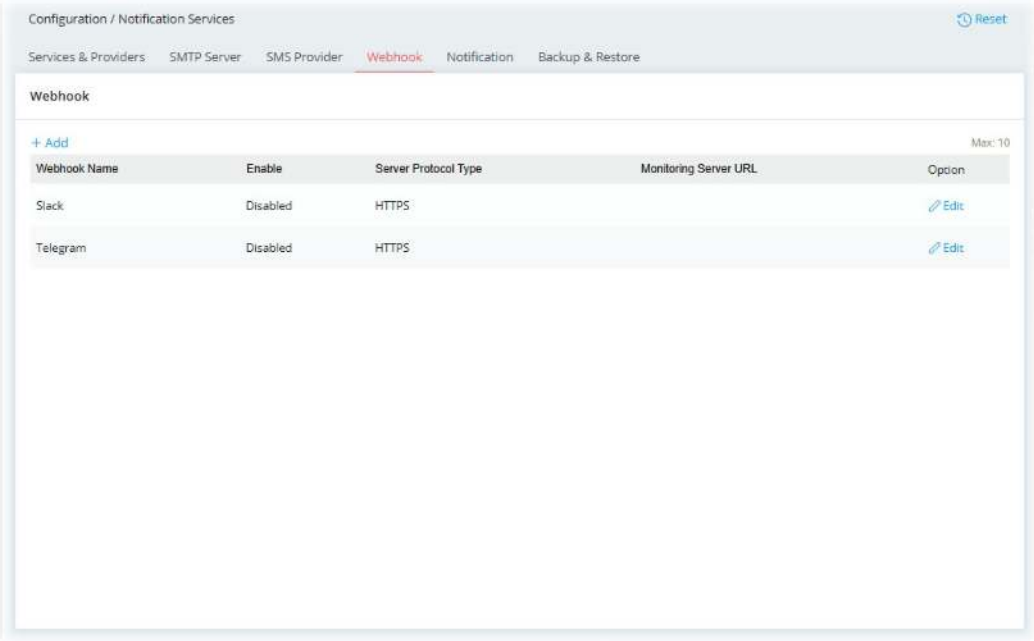
Through	
Service Provider	Vigor Router SMS Gateway – Not all Vigor routers support the SMS function. This option allows you to set the IP address of the router which can be treated as a SMS gateway. Customized – Set the IP address or URL provided by the SMS provider.
When Vigor Router SMS Gateway is selected as the Service Provider	SMS Gateway URL – Enter an identifier (domain name or IP address) for the service provider. Connection Protocol – Specify HTTP or HTTPS. Username - Used for being authenticated by the Service Provider. Maximum length is 31 characters. Password - Used for being authenticated by the Service Provider. Maximum length is 31 characters.
When Customized is selected as the Service Provider	SMS Provider API URL – Enter the URL for the SMS service. Maximum length is 255 characters. Contact the service provider for the appropriate URL to use. SMS API Parameter - For each API (Application Programming Interface) with an independent Text Message and Recipient Number (Send to), please enter the strings represented by each API. HTTP Method – Two request methods offered here. • GET - Used to request data from a specified resource. • POST - Used to send data to a server to create/update a resource.
SMS Quota Enabled	Switch the toggle to enable/disable the quota setting.
SMS Quota	Remaining number of text messages allowed to be sent. The quota value reduces by 1 every time the router sends an SMS message. When the quota reaches 0, no SMS will be sent until it is reset to greater than 0.
Sending Intervals	Minimum amount of time, in seconds, to wait between sending SMS messages.
Send Test SMS to	Specify an email address. Send Test Message - Click it to send a test e-mail according to above configuration.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

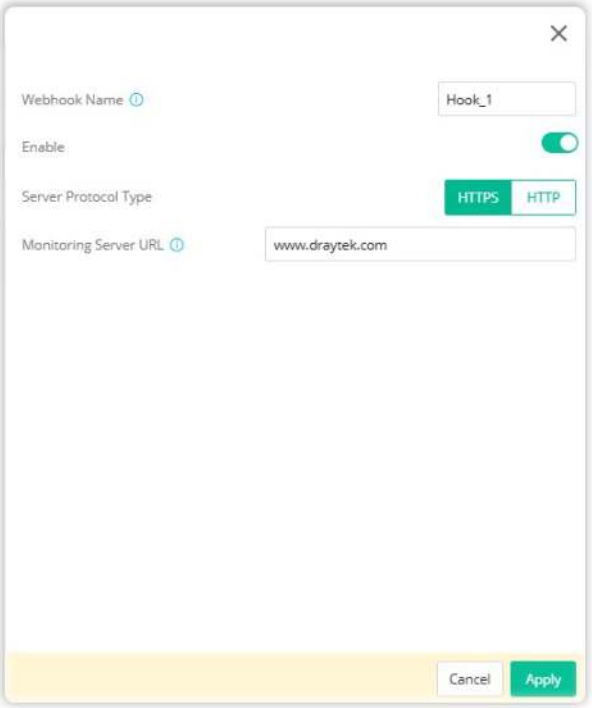
II-1-15-4 Webhook

Vigor router will send a report (webhook message) including WAN up, down, CPU usage, memory usage and etc. to a monitoring server periodically.

Up to 10 webhook profiles can be set up.



To add a new profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

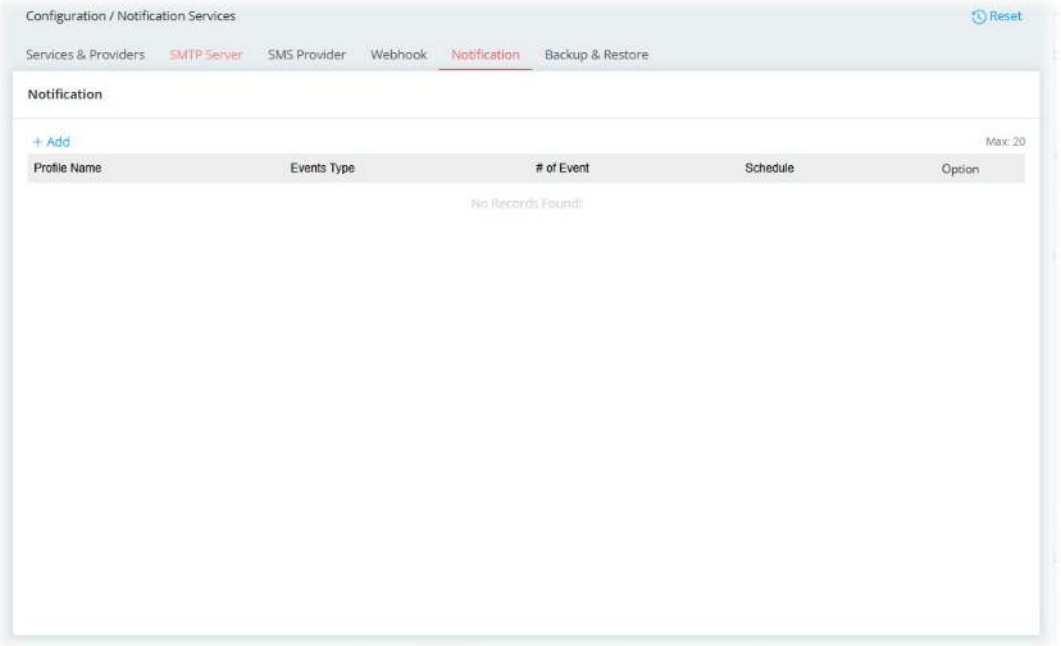
Item	Description
Webhook Name	Enter the name of the profile.
Enable	Switch the toggle to enable/disable this profile.

Server Protocol Type	Select the protocol (HTTPS or HTTP) used for the server.
Monitoring Server URL	Enter the URL of a server.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

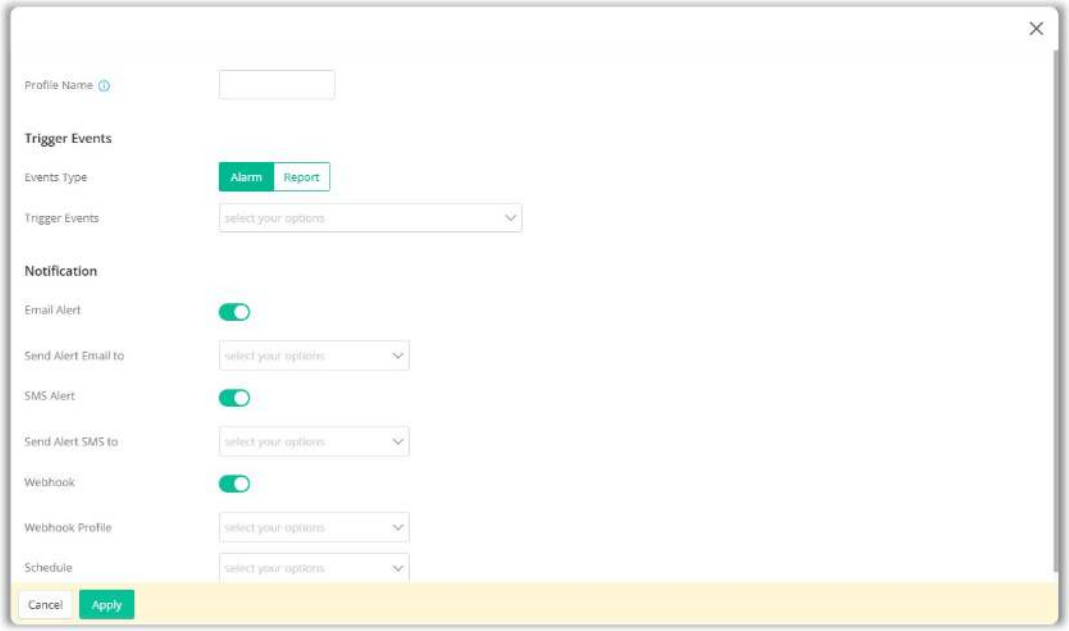
After finishing this web page configuration, please click Apply to save the settings.

II-1-15-5 Notification

Up to 20 notification profiles can be created and applied with the provider notification services.



To add a new profile, click the +Add link to get the following page.



Available settings are explained as follows:

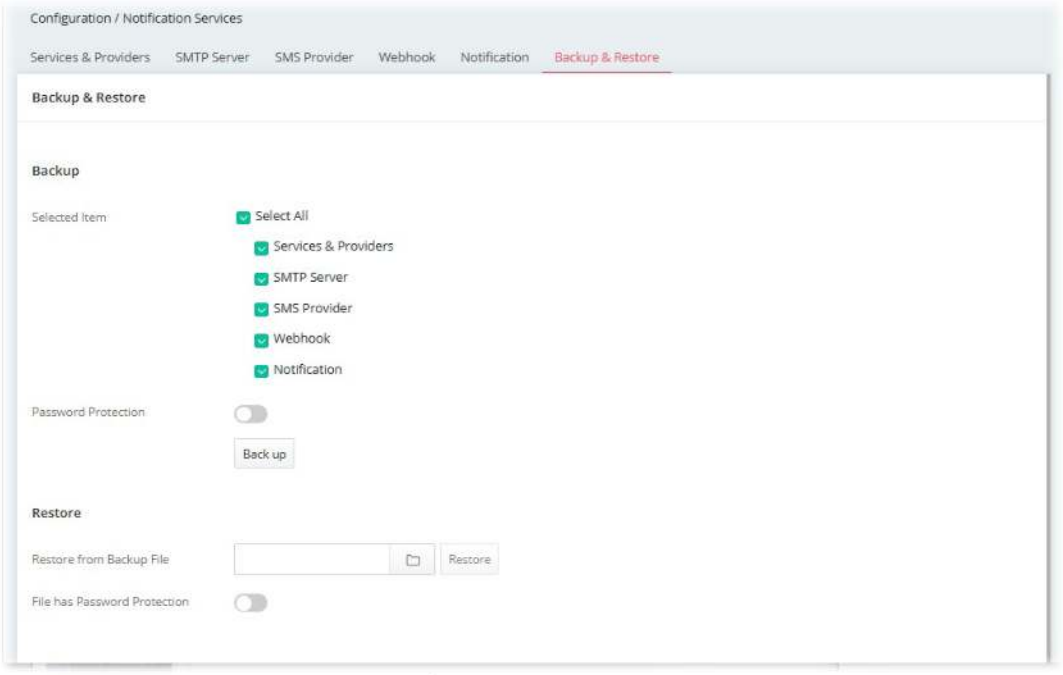
Item	Description

Profile Name	Enter the name of the service profile.
Events Type	Alarm – The Vigor system will send alert messages to recipients if an alert event occurs. Report – The Vigor system will periodically send reports to recipients when an alert event occurs. • Report Period – Set the period (60-360 minutes) for Vigor system to send out the report by email, SMS and etc.
Trigger Events	Select the events that allow the Vigor system to send reports or alerts via email, SMS, and more using the drop-down list.
Email Alert	Switch the toggle to enable / disable the email alert function. Send Alert Email to - Select the email profile(s) for sending out the notification by email.
SMS Alert	Switch the toggle to enable / disable the SMS alert function. Send Alert SMS to - Select the SMS profile(s) for sending out the notification by SMS.
Webhook	Switch the toggle to enable / disable the webhook notification. Webhook Profile - Select the webhook profile(s) for sending out the notification.
Schedule	Select the schedule profile(s) to send the notification (SMS, Email).
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-15-6 Backup & Restore

Backup and restore the configuration settings for notification services.



Available settings are explained as follows:

Item	Description

Selected Item	Select the items for which settings will be backed up or restored.
Password Protection	Switch the toggle to enable or disable the function. If enabled, set a password. New Password – Enter a string as the password. Confirm New Password – Enter the string again. Back up – Click to perform the backup job.
Restore from Backup File	Select the backup file you wish to restore.
File has Password Protection	Switch the toggle to enable or disable the function. If enabled, set a password. Password – Please enter a string to use as the password for restoring the configuration.

II-1-16 RADIUS/TACACS+

Remote Authentication Dial-In User Service (RADIUS) is a security authentication client/server protocol that supports authentication, authorization and accounting, which is widely used by Internet service providers. It is the most common method of authenticating and authorizing dial-up and tunneled network users.

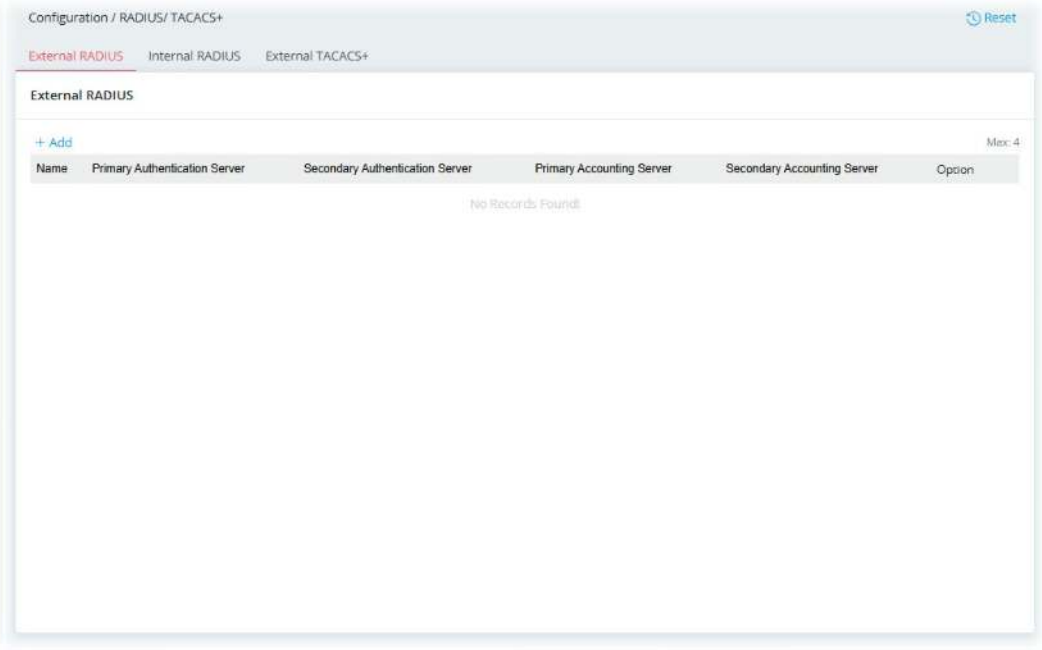
The router supports external TACACS+ and internal and external RADIUS servers for user authentication. Services that require user authentication include WLAN and VPN.

II-1-16-1 External RADIUS

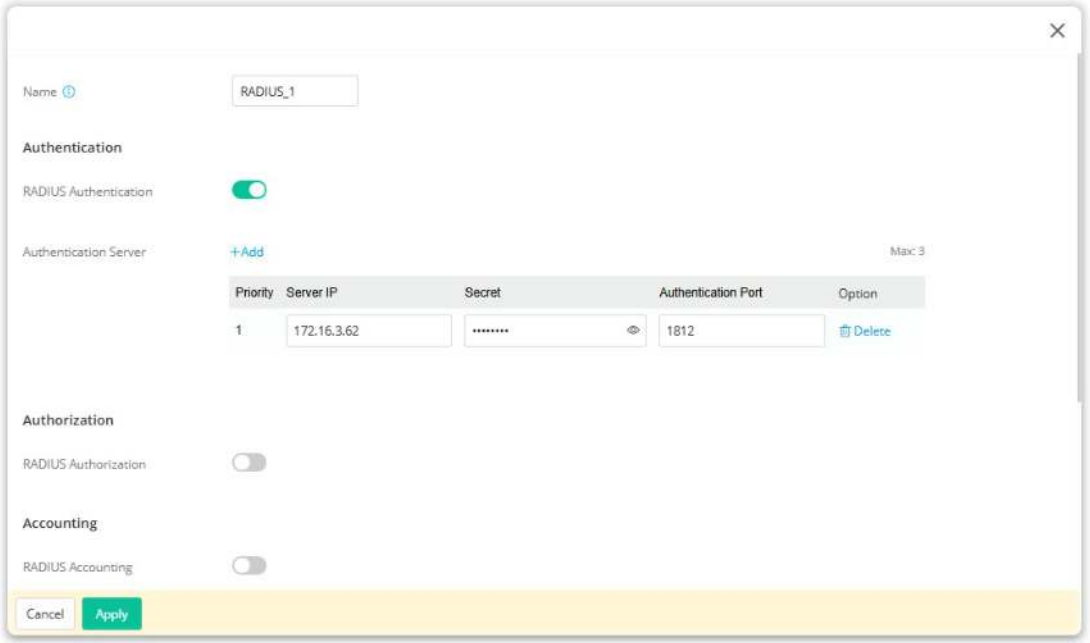
The built-in RADIUS client feature enables the router to assist the remote dial-in user or a wireless station and the RADIUS server in performing mutual authentication. It enables centralized remote access authentication for network management.

Vigor router can be operated as a RADIUS client. This web page is used to configure settings for external RADIUS server. Then LAN users of Vigor router will be authenticated and accounted by such server for network application.

Select External RADIUS to configure the router to use an external RADIUS server for user authentication.



To add a new profile, click the **+Add** link (up to 4) to get the following page.

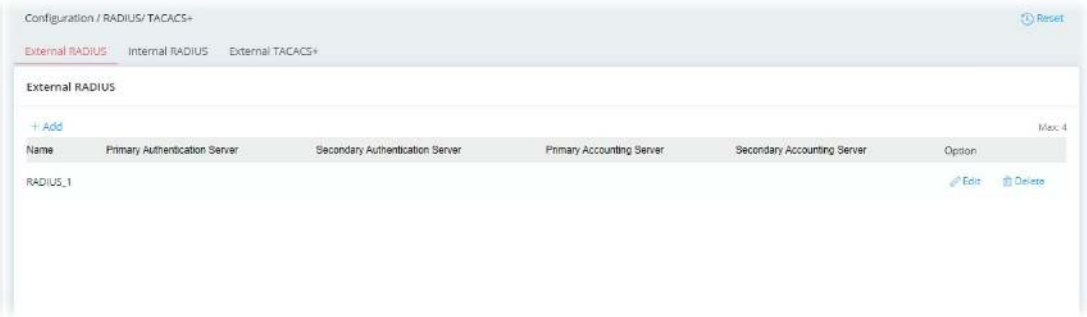


Available settings are explained as follows:

Item	Description
Name	Enter the name of the profile.
	Authentication
RADIUS Authentication	Switch the toggle to enable/disable this profile.
Authentication Server	+Add – Click to add a server (up to 3). Server IP –Enter the IP address of RADIUS server. Secret – The RADIUS server and client share a secret that is used to authenticate the messages sent between them. Both sides must be configured to use the same shared secret. The maximum length of the shared secret you can set is 36 characters. Authentication Port – The UDP port number that the RADIUS server is using. The default value is 1812, based on RFC 2138. Option (Delete) - Remove the selected server.
	Authorization
RADIUS Authorization	Switch the toggle to enable/disable this profile. Disconnect Message Port - Set a UDP port number (3799 in default) for receiving the disconnected-request packets from the AAA server. Note that these packets have been accepted by the RADIUS server before being disconnected by the AAA server.
	Accounting
RADIUS Accounting	RADIUS Accounting is a network customer billing mechanism for RADIUS server. If enabled, Vigor router will deliver accounting request (e.g., IP address, traffic from the client) to the specified RADIUS server periodically. Switch the toggle to enable/disable this profile.
Accounting Server	+Add - Click to add a server (up to 3). Server IP - Enter the IP address of RADIUS server. Secret - The RADIUS server and client share a secret that is used to

	authenticate the messages sent between them. Both sides must be configured to use the same shared secret. The maximum length of the shared secret you can set is 36 characters. Authentication Port - Set the UDP port number (1813 in default) as the accounting port. Option (Delete) - Remove the selected server.
Interim Update Interval	Set an interval time from 10 minutes to 1440 minutes (1 day) for the router to deliver the accounting request to the RADIUS server.
RADIUS Server Failover Policy	
Retry	Set the number of attempts to perform reconnection with RADIUS server. If the connection (with the Primary Server) still fails, stop the connection attempt and begin to make connection with the secondary server.
Timeout	Set a timeout value for the router waiting for a response from the RADIUS server. If no response, Vigor router will send the authentication request again.
Connection Test	
Connection Test	Test with Status Server – Click to make a test of authentication server and accounting server.
Server Status	Display the test result of the connection test.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

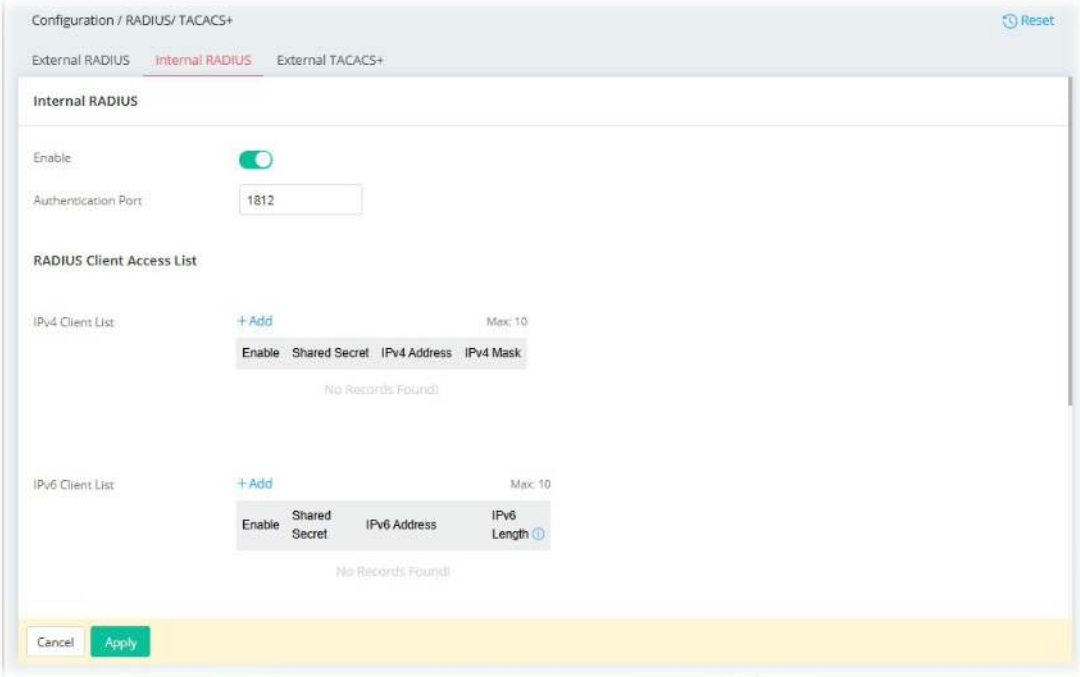
After finishing this web page configuration, please click Apply to save the settings.



II-1-16-2 Internal RADIUS

Except for being a built-in RADIUS client, Vigor router also can be operated as a RADIUS server which performs security authentication by itself. This page is used to configure settings for internal RADIUS server. Then LAN user of Vigor router will be authenticated by Vigor router directly.

Select Internal RADIUS to configure the router's built-in RADIUS server.



Available settings are explained as follows:

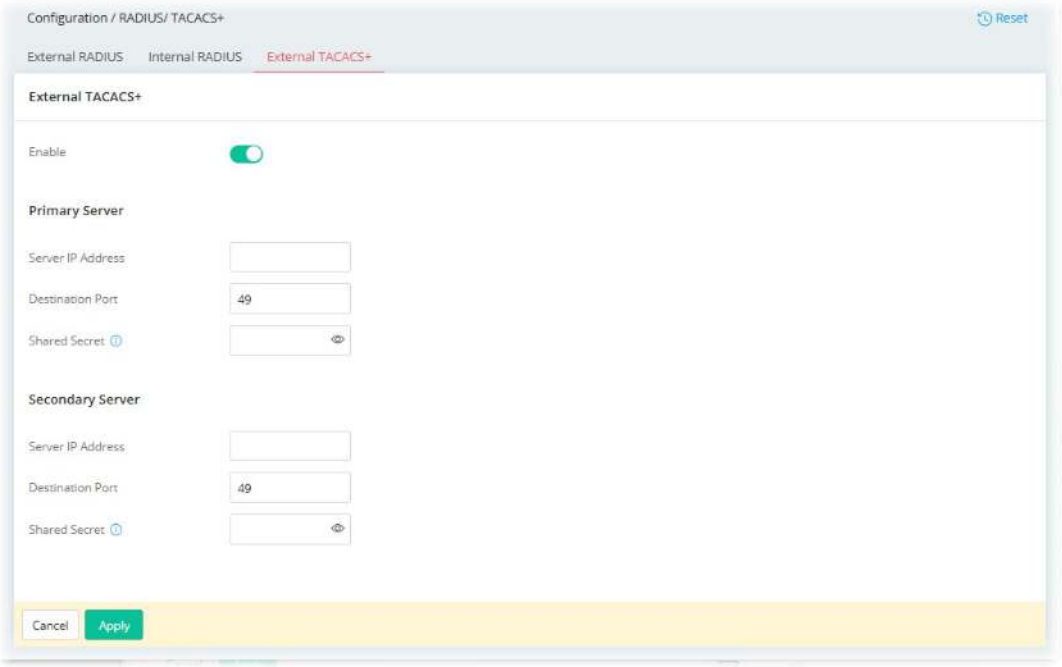
Item	Description
Enabled	Switch the toggle to enable/disable settings for this RADIUS server.
Authentication Port	The UDP port number that the RADIUS server is using. The default value is 1812, based on RFC 2138.
	RADIUS Client Access List
IPv4 Client List	Only clients that meet the criteria configured in the access list are allowed to access the RADIUS server. +Add – Click to add a client (up to 10). Enabled –Switch the toggle to enable/disable this entry. Shared Secret – A text string that is known to both the router's RADIUS server and the RADIUS client that is used to authenticate messages sent between them. Maximum length is 36 characters. IPv4 Address – Enter the IPv4 address of the client. IPv4 Mask – Select the IP mask to configure the size of the IP block. Option (Delete) - Remove the selected client.
IPv6 Client List	Only clients that meet the criteria configured in the access list are allowed to access the RADIUS server. +Add – Click to add a client (up to 10). Enabled –Switch the toggle to enable/disable this entry. Shared Secret – A text string that is known to both the router's RADIUS server and the RADIUS client that is used to authenticate messages sent between them. Maximum length is 36 characters. IPv6 Address –Enter the IPv6 address of the client. IPv6 Length – Enter the prefix length of the IPv6 block. Option (Delete) - Remove the selected client.
	Authentication
Method	Specify the way to authenticate the wireless client. PAP Only – Only the Password Authentication Protocol will be used

	to validate users. PAP/CHAP/MS-CHAP/MS-CHAP2 - PAP, CHAP (Challenge-Handshake Authentication Protocol), and Microsoft versions of CHAP can be used to validate users.
802.1X Method	Support 802.1X Method – The built in RADIUS server offered by Vigor router can act as the AAA server. Select to enable 802.1X support.
Certificate	Select the certificate (created by Configuration>>Certificates>>Local Certificates) for applying to Internal RADIUS.
	User Profile
User	During the process of security authentication, user account and user password will be required for identity authentication. Before configuring such page, create at least one user profile in IAM>>Users & Groups first. All Users – Click to make all user profiles for security authentication. Select Users – Click to select the user profile(s) for security authentication.
User Group	All Groups – Click to make all user groups for security authentication. Select Groups – Click to select the user groups for security authentication.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-1-16-3 External TACACS+

It means Terminal Access Controller Access-Control System Plus. It works like RADIUS does. Click the External TACACS+ to open the following page:



Available settings are explained as follows:

Item	Description
Enabled	Switch the toggle to enable/disable this profile.
	Primary Server/Secondary Server
Server IP Address	Enter the IP address of the TACACS+ server. Two external TACACS+ servers are allowed to set in this page. The secondary TACACS+ server will be used as a backup server when the primary TACACS+ server is down.
Destination Port	Enter the port used by the TACACS+ server. Port 49 is most common.
Shared Secret	A text string that is known to both the TACACS+ server and client (the router) that is used to authenticate messages sent between them. Maximum length is 36 characters.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

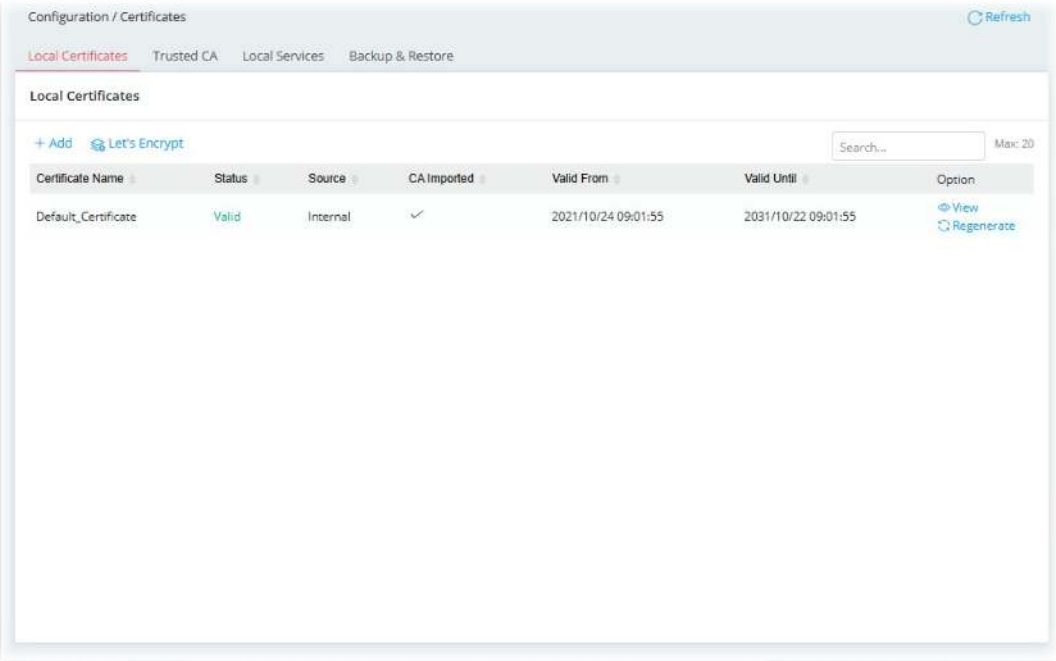
II-1-17 Certificates

A digital certificate is an electronic document issued by a certification authority (CA) to an entity to prove ownership of a public key. It contains identifying information including the issued-to party's name, a serial number, expiration dates etc., and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real. Vigor router supports digital certificates that conform to the X.509 standard.

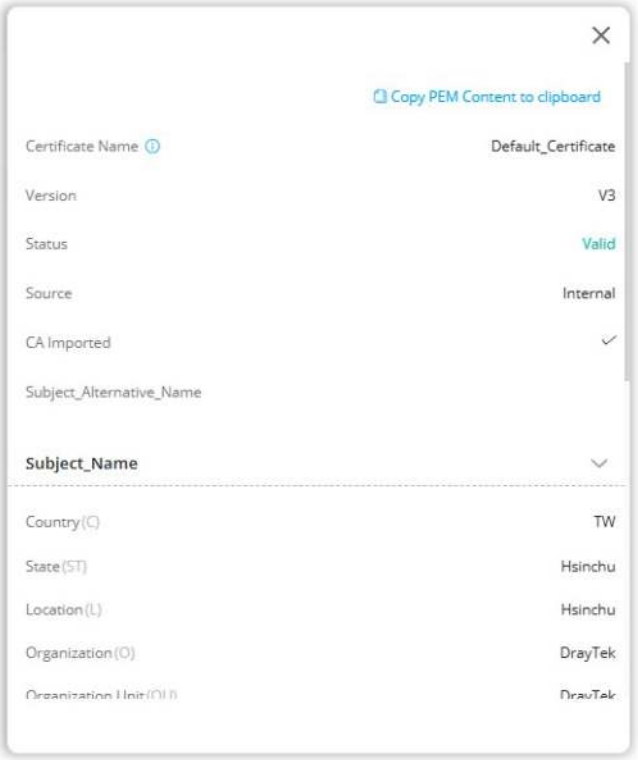
In this section, you can generate and manage local digital certificates, and import trusted CA certificates. Be sure that the system time is correct on the router so that certificates will not be erroneously considered to be invalid because of an incorrect system time falling outside of the certificate's valid time period. The easiest way to accomplish this is by periodically synchronizing the system time to a Network Time Protocol (NTP) server.

II-1-17-1 Local Certificates

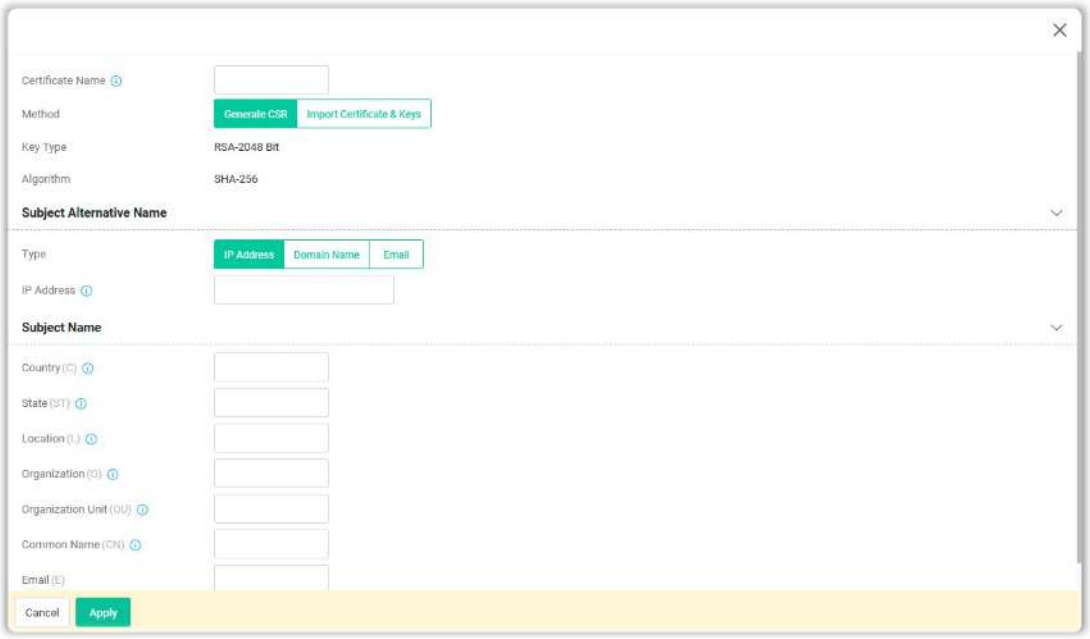
You can generate, import or view local certificates on this page.



To check detailed information of the selected certificate, click View.



To add a new certificate, click the +Add link to get the following page.



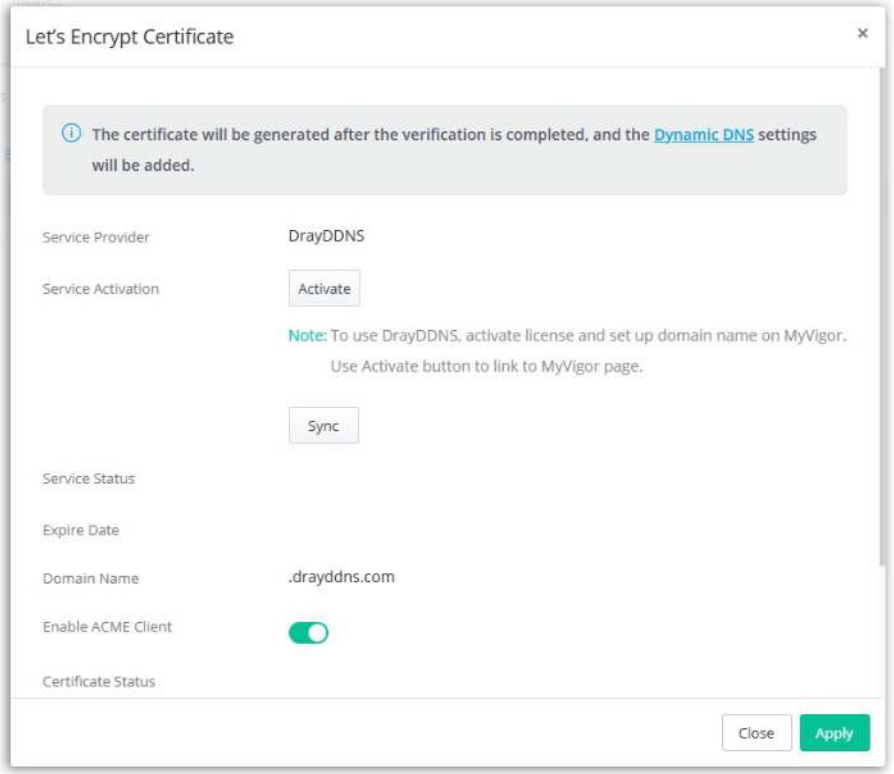
Available settings are explained as follows:

Item	Description
Certificate Name	Enter the name that identifies the certificate.
Method	Generate CSR - Generate a new local certificate. Import Certificate & Keys - Vigor router allows you to generate a certificate request and submit it the CA server, then import it as "Local Certificate". If you have already gotten a certificate from a third party, you may import it directly. The supported types are PKCS12 Certificate and Certificate with a private key.

Method - Generate CSR	
Key Type	Displays the key type used by the certificate.
Algorithm	Displays the algorithm for generating the certificate.
Type	Select the type of Subject Alternative Name and enter its value. ● IP Address ● Domain Name ● Email
Country (C)	Enter the country name (code) in which your organization is located.
State (ST)	Enter the state or province where your organization is located.
Location (L)	Enter the city where you're your organization is located.
Organization (O)	Enter the legal name of your organization.
Organization Unit (OU)	Enter the department within your organization that you wish to be associated with this certificate.
Common Name (CN)	Enter the fully-qualified domain name / WAN IP that will be used to reach your server.
Email (E)	Enter the email address of the entry.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.
Method - Import Certificate & Keys	
File Type	Vigor router allows you to generate a certificate request and submit it the CA server, then import it as "Local Certificate". If you have already gotten a certificate from a third party, you may import it directly. The supported types are PKCS12 Certificate and Certificate with a private key. Certificate Only - Local certificate. ● Upload Certificate - Click Choose a file to select a local certificate file. PKCS12 - Users can import the certificate whose extensions are usually .pfx or .p12. And these certificates usually need passwords. PKCS12 is a standard for storing private keys and certificates securely. It is used in (among other things) Netscape and Microsoft Internet Explorer with their import and export options. ● Upload PKCS12 File - Click Choose a file to select a PKCS12 certificate file. ● Password - Enter the password associated with the certificate and key files. Certificate & Keys - It is useful when users have separated certificates and private keys. And the password is needed if the private key is encrypted. ● Upload File - Click Choose a file to select a local certificate file. ● Upload Key - Click Choose a file to select a key file. ● Password - Enter the password associated with the certificate and key files.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

In addition to manually creating local certificates, you can use Let's Encrypt to generate certificates. Click the Let's Encrypt link in Configuration>>Certificates>>Local Certificates to get the following page. Here, you can use the DrayDDNS service to generate Let's Encrypt certificates. You can also view other options in Configuration>>WAN>>Dynamic DNS.



Available settings are explained as follows:

Item	Description
Service Provider	Display the service provider of the Let's Encrypt Certificate.
Service Activation	Activate – Click to link to MyVigor web site to activate the Let's Encrypt Certificate. Sync - The domain name for DrayDDNS is set on the MyVigor server. Click this button to load and obtain the domain name if it is available.
Enable ACME Clent	Switch the toggle to generate a certificate issued by Let's Encrypt for applying to such DDNS account.
More Settings	
Update DDNS with	If a Vigor router is installed behind any NAT router, you can enable this function to locate the real WAN IP. When the WAN IP used by Vigor router is private IP, this function can detect the public IP used by the NAT router and use the detected IP address for DDNS update. There are two methods offered for you to choose: Internet IP –The real public IP address will be used. Select this option if the IP address assigned to the router's WAN interface is not the actual external IP address. WAN IP – The IP address of the router's WAN interface will be used.
Update WAN IP Mode	Update All Selected WAN IPs – Vigor router system will obtain the multiple WAN IPs based on the following table and upload to the

	service provider. Update Single WAN IP by Sequence – Vigor system will use the first selected WAN IP from the following table and upload to the service provider. +Add – Click to create a new group of Binding Interface and Interface IP. Up to 6 sets can be created. Binding Interface – Select the WAN interface associated with the DDNS profile. Interface IP – Select a WAN IP. If not, the default WAN IP will be used instead.
Auto Update Interval	The frequency, in minutes, at which the router connects to DDNS servers to update IP address information. The default is 14400.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click **Apply** to save the settings.

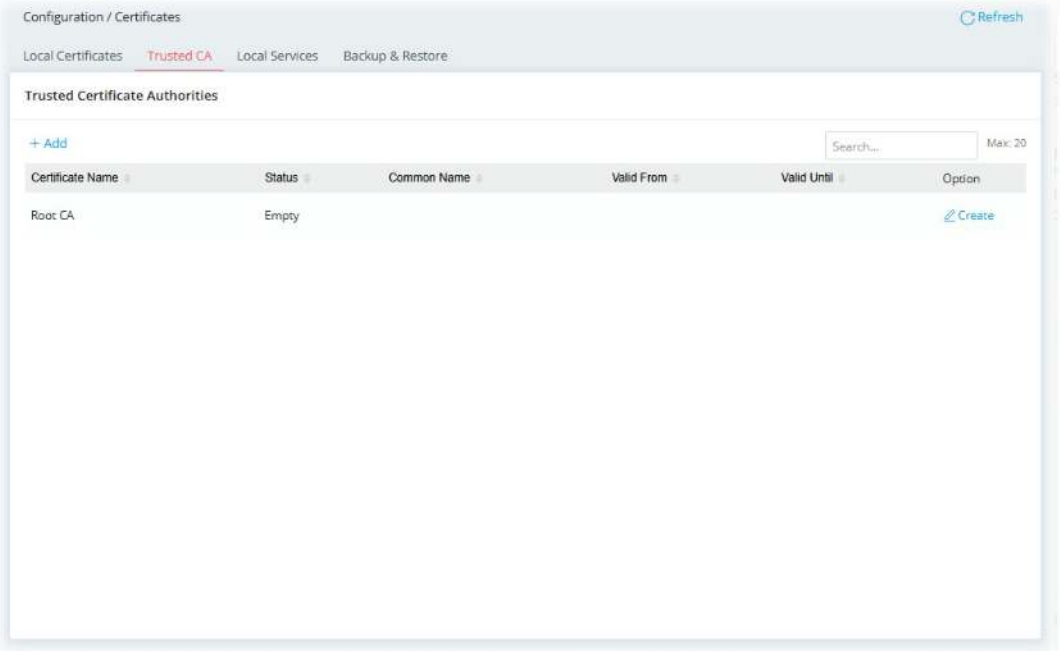
II-1-17-2 Trusted CA

The user can build RootCA certificates (up to three) if required.

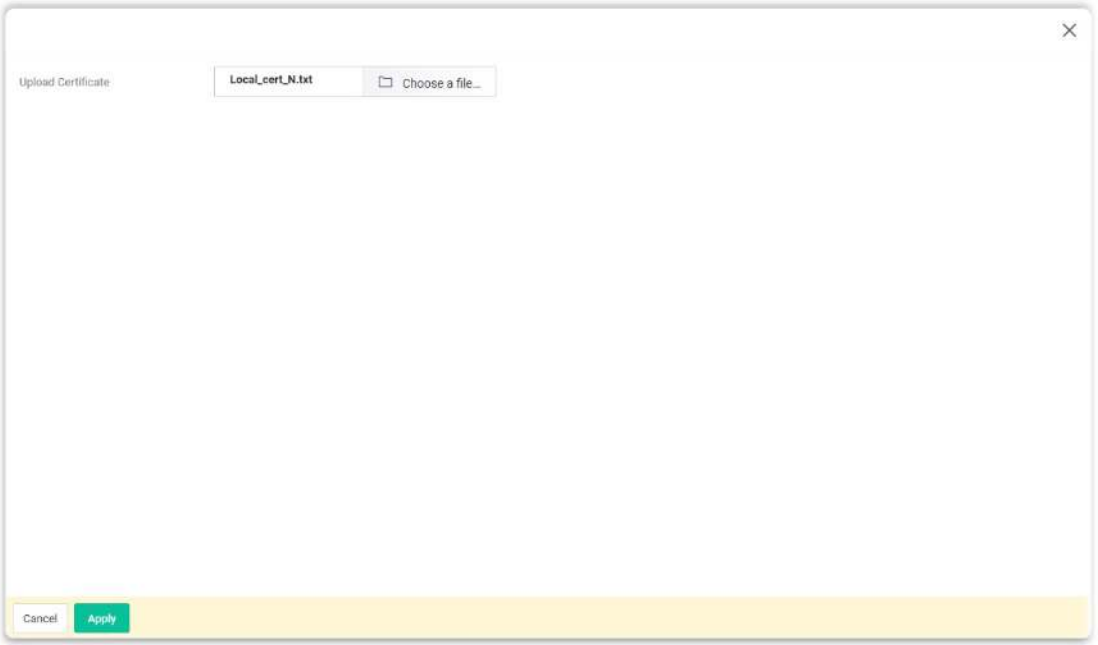
Trusted CA certificate lists three sets of trusted CA certificate. In addition, you can build a RootCA certificate if required.

When the local client and remote client are required to make certificate authentication (e.g., IPsec X.509) for data passing through SSL tunnel and avoiding the attack of MITM, a trusted root certificate authority (Root CA) will be used to authenticate the digital certificates offered by both ends.

However, the procedure of applying digital certificate from a trusted root certificate authority is complicated and time-consuming. Therefore, Vigor router offers a mechanism which allows you to generate root CA to save time and provide convenience for general user. Later, such root CA generated by DrayTek server can perform the issuing of local certificate.



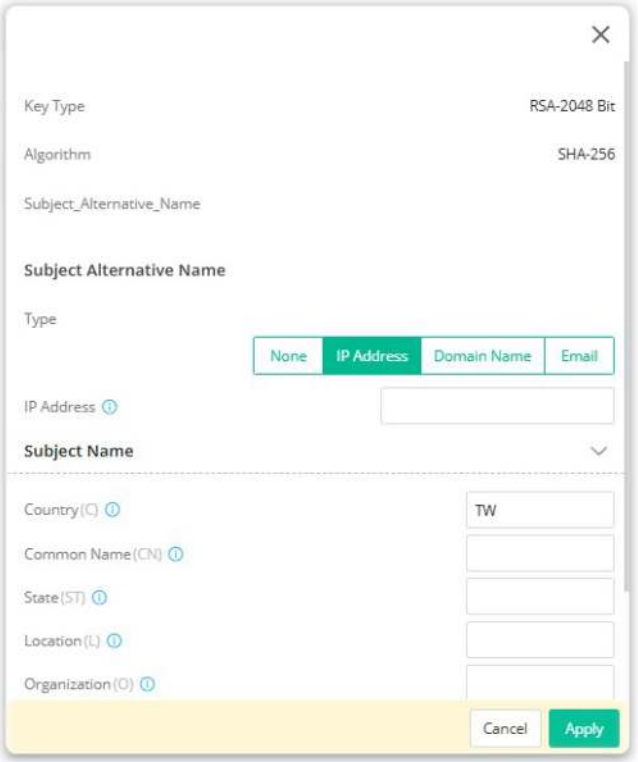
To import a RootCA to the Vigor router, click **+Add** to upload one certificate.



Available settings are explained as follows:

Item	Description
Upload Certificate	Choose a file - Select a local certificate file.
Cancel	Discard current settings and return to the previous page.
Apply	Click to import selected certificate file to the router.

To create a new RootCA, click **Create** to get the following page.



Available settings are explained as follows:

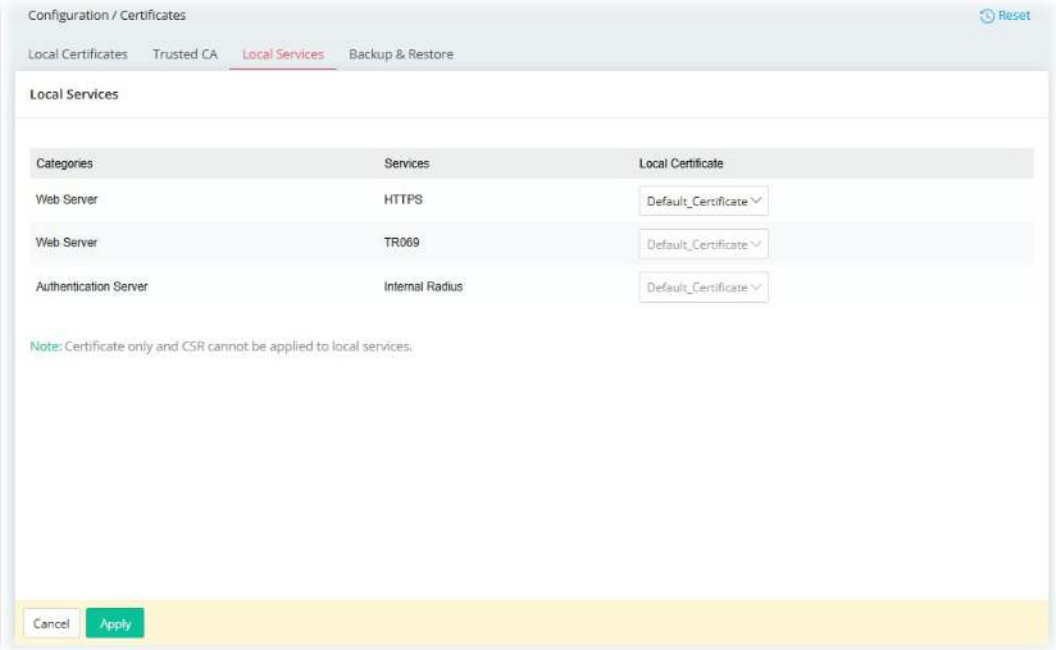
Item	Description

Key Type	Displays the key type (set to RSA).
Algorithm	Displays the algorithm.
Subject Alternative Name	
Type	Vigor router accepts the type and value of the specified subject alternative name as valid authentication. Supported subject alternative types are IP Address, Domain Name and E-Mail. Select the type of Subject Alternative Name and enter its value.
Subject Name	
Country (C)	Enter the country name (code) in which your organization is located.
Common Name (CN)	Enter the fully-qualified domain name / WAN IP that will be used to reach your server.
State (ST)	Enter the state or province where your organization is located.
Location (L)	Enter the city where you're your organization is located.
Organization (O)	Enter the legal name of your organization.
Organization Unit (OU)	Enter the department within your organization that you wish to be associated with this certificate.
Email (E)	Enter the email address of the entry.
Cancel	Discard current settings and return to the previous page.
Apply	Click to submit generate request to the CA server.

After finishing this web page configuration, please click Apply to save the settings.

II-1-17-3 Local Services

This page allows you to set different categories and services for the local certificate(s) to prevent security warning messages popped up due to using different browsers.



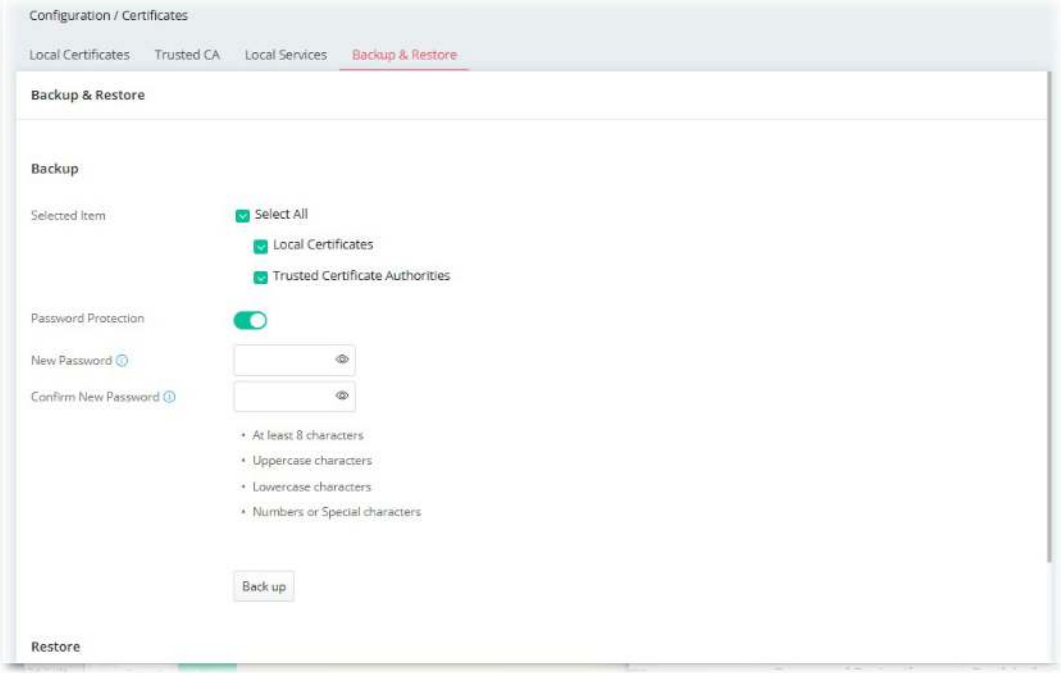
Available settings are explained as follows:

Item	Description
Local Certificate	Select a local certificate (has been imported to Vigor device) with full key and authentication information. Certificate without key phrase or CSR (certificate signing request) file cannot be selected as local certificate.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

II-1-17-4 Backup & Restore

You can back up or restore the Local and Trusted CA certificates on the router to a file.



Available settings are explained as follows:

Item	Description
	Backup
Selected Item	Select the certification type (local, trusted or all certificates).
Password Protection	Enabled - Switch the toggle to enable or disable the function. ● New Password - Enter the password with which you wish to encrypt the certificate. ● Confirm New Password - Enter the password again. Back up - Click to download the certificate.
	Restore
Restore from Backup file	Click to select the backup file you wish to restore. 🗀 - Click to locate the file for restoring. Restore - Click to retrieve the certificate.
File has Password Protection	Enabled - Switch the toggle to enable or disable the function. ● Password - Enter the password that was used to encrypt the certificates.

II-2 Security

II-2-1 Firewall Filters

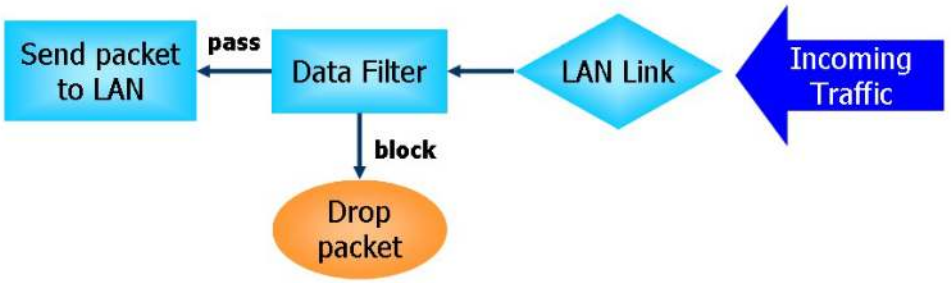
A network firewall monitors traffic travelling between networks, with the ability to selectively allow or block traffic using a predefined set of security rules. This helps to maintain the integrity of networks by stopping unauthorized access and the exchange of sensitive information.

LAN users are provided with secured protection by the following firewall facilities:

- User-configurable IP filter (Data Filter).
- Stateful Packet Inspection (SPI): tracks packets and denies unsolicited incoming data
- Selectable Denial of Service (DoS) /Distributed DoS (DDoS) attacks protection

Data Filter

All traffic, both incoming and outgoing, that does not trigger a PPP connection attempt (either because a PPP connection is not necessary, or the required PPP connection has already been established) is checked against the Data Filter, and will be allowed or blocked according to the rules configured within.



Stateful Packet Inspection (SPI)

Stateful inspection is a firewall architecture that works at the network layer. Unlike legacy static packet filtering, which examines a packet based on the information in its header, stateful inspection builds up a state machine to track each connection traversing all interfaces of the firewall and makes sure they are valid. The stateful firewall of Vigor router not only examines the header information also monitors the state of the connection.

Denial of Service (DoS) Defense

DoS attacks are categorized into two types: flooding-type attacks and vulnerability attacks. Flooding-type attacks attempts to exhaust system resources while vulnerability attacks attempts to paralyze the system by exploiting vulnerabilities of protocols or operation systems.

Vigor's DoS Defense functionality detects DoS attacks and mitigates their damage by inspecting every incoming packet, and malicious packets will be blocked. If Syslog is enabled, alert messages will also be sent. Abnormal traffic flow such as flood and port scan attacks that exceed allowable thresholds are also blocked.

The below shows the attack types that DoS/DDoS defense function can detect:

1. SYN flood attack
2. UDP flood attack
3. ICMP flood attack
4. Port Scan attack
5. IP options
6. Land attack
7. Smurf attack
8. Trace route
9. SYN fragment
10. Fraggle attack
11. TCP flag scan
12. Tear drop attack
13. Ping of Death attack
14. ICMP fragment
15. Unassigned Numbers

II-2-1-1 IP Reputation Filters

An IP Reputation Filter is a security tool that evaluates the trustworthiness of an IP address based on its historical behavior and various factors. This filter helps detect and prevent malicious activities, such as spam, hacking attempts, and other forms of cyberattacks.

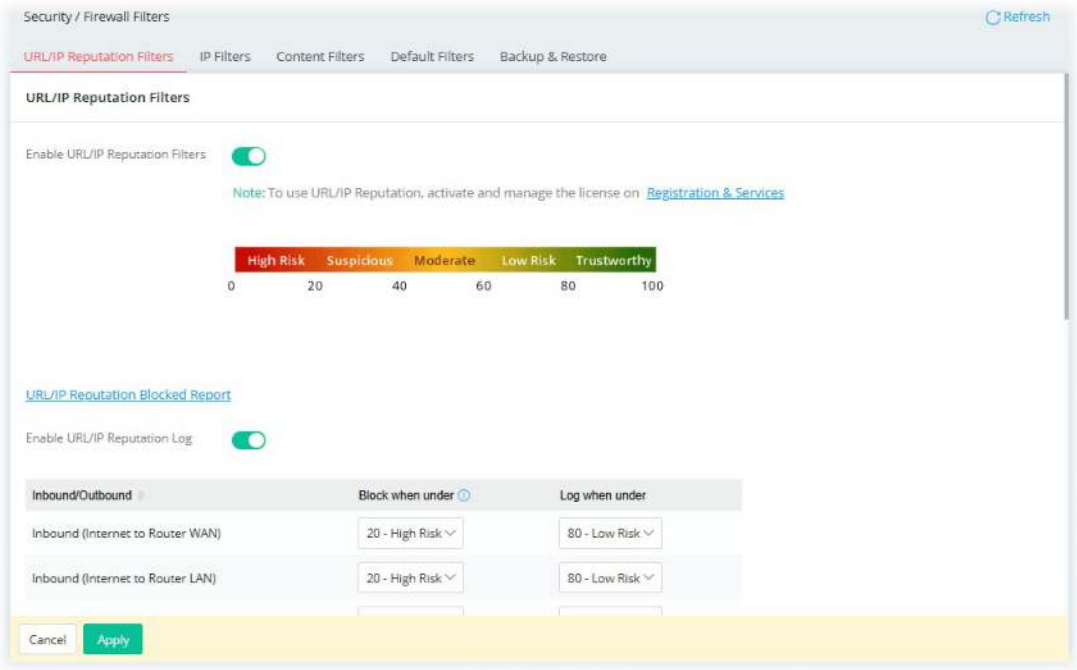
The IP Reputation Filter used by the Vigor router is designed to filter and block dangerous IP addresses. To effectively implement this filtering, three directions need to be considered as filtering conditions:

1. Inbound (from the Internet to the router's WAN)

2. Inbound (from the Internet to the router's LAN)

3. Outbound (from the LAN to the Internet)

This approach ensures comprehensive protection against harmful IP addresses.



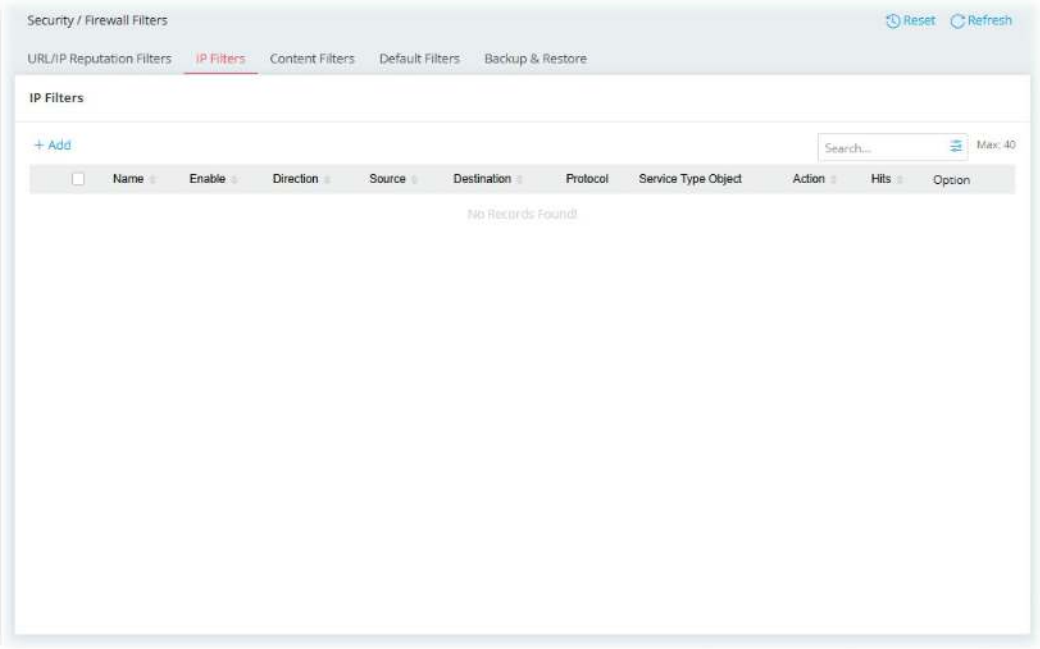
Available settings are explained as follows:

Item	Description
IP Reputation Filters	
Enable IP Reputation Filters	Switch the toggle to enable/disable this feature.
IP Reputation Block Report	Click to show the IP Reputation blocked report.

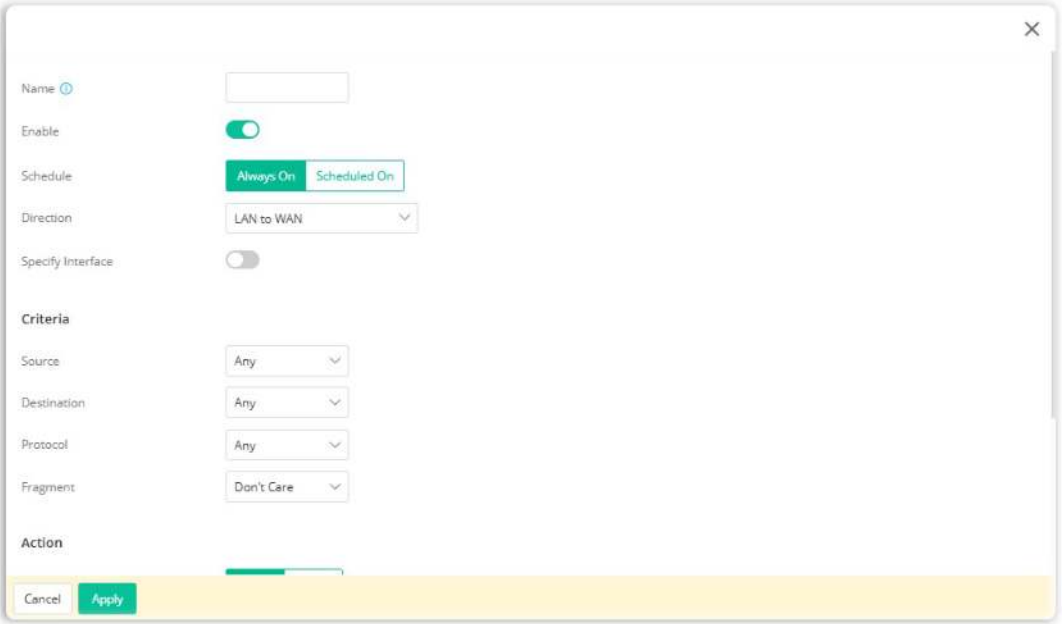
Enable IP Reputation Log	Switch the toggle to enable or disable the logging function.
Block when under	Select the risk level. Once the risk for the packets (incoming/outgoing) reaches the threshold (20/40/60/80) defined here, Vigor system will block the IP immediately. The default setting is "Disabled," which means that no filtering will be performed.
Log when under	Select the risk level. Once the risk for the packets (incoming/outgoing) reaches the percentage defined here, Vigor system will record corresponding information to the SysLog server. The default is Disabled.
Allow List	
Inbound (Internet to Router WAN) / Inbound (Internet to Router LAN) / Outbound (LAN to Internet)	IP address(es) of the clients within the allow list will not be filtered via IP Reputation Filter. The direction of packet transmission includes: • Inbound (Internet to Router WAN) • Inbound (Internet to Router LAN) • Outbound (LAN to Internet) Click on each tab to create the allow list separately. +Add (for IP) – Click to add a new IP address as the member within the allow list. • IP Address – Enter the IP address. +Add (for Object) – Click to add a new object / group as the member within the allow list. • Object & Group – Use the drop-down list to specify the object & group profile. +Add (for Port) – Click to select a new service type.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

II-2-1-2 IP Filters

Users can create access control policies and set black & white lists.



To add a new IP filter profile, click the +Add link to get the following page.



Available settings are explained as follows:

Item	Description
Name	Enter a name to identify the rule.
Enable	Switch the toggle to enable/disable this profile.
Schedule	Always On – This rule is enabled and active for always. Scheduled On - Select Schedule indexes to allow the rule to be enabled at specific times. You may choose up to 4 out of the 15 schedules in Configurations>>Objects>>Schedule. The rule is always enabled when no indexes have been selected. • Clear Session when Schedule is On - Select this option to clear existing sessions when the rule is changes is enabled by a schedule profile. All connections will be reset.

Direction	Specify the direction of traffic flow to which this filter rule applies. • LAN to WAN • WAN to LAN • LAN/VPN to LAN/VPN
Specify Interface	Switch the toggle to enable/disable the function. If enabled, specify the interfaces for the traffic flow. Source Interface – Select the LAN/VPN interface(s). Destination Interface – Select the WAN interface(s).
Criteria	
Source	Configure the source IP addresses. To set the IP address manually, please choose Any / IPv4 Address / IPv4 Subnet / IPv6 Address / IPv6 Subnet / IP Object / IP Group / MAC Object / MAC Group as the source and enter required information. Any – All IP addresses IPv4 Address–Enter the IP address. • Source IPv4 Address – Click +Add to enter the IP address. IPv4 Subnet–Enter the IP Address and the Subnet Mask. • Source IPv4 Subnet Address - Click +Add to enter the IPv4 address with a subnet mask. IPv6 Address–Enter the IPv6 address. • Source IPv6 Address – Click +Add to enter the IPv6 address. IPv6 Subnet–Enter the IPv6 Address and the prefix length. • Source IPv6 Subnet Address - Click +Add to enter the IPv6 address with a subnet mask. IP Object–Allows selection of predefined IP Objects. • Source IP Object – Click +Add to select an IP object. IP Group –Allows selection of predefined IP Groups. • Source IP Group - Click +Add to select an IP group. MAC Object–Allows selection of predefined MAC Objects. • Source MAC Object – Click +Add to select an MAC object. MAC Group –Allows selection of predefined MAC Groups. • Source MAC Group - Click +Add to select an MAC group.
Destination	Configure the destination IP addresses. To set the IP address manually, please choose Any / IPv4 Address / IPv4 Subnet / IPv6 Address / IPv6 Subnet / IP Object / IP Group as the destination and enter required information. Any – All IP addresses IPv4 Address–Enter one IPv4 address. • Destination IPv4 Address – Click +Add to enter the IP address. IPv4 Subnet–Enter the IPv4 Address and the Subnet Mask. • Destination IPv4 Subnet Address - Click +Add to enter the IPv4 address with a subnet mask. IPv6 Address–Enter the IPv6 address. • Destination IPv6 Address – Click +Add to enter the IPv6 address. IPv6 Subnet–Enter the IPv6 Address and the prefix length. • Destination IPv6 Subnet Address - Click +Add to enter the IPv6

	address with a subnet mask. IP Object–Allows selection of predefined IP Objects. • Destination IP Object – Click +Add to select an IP object. IP Group –Allows selection of predefined IP Groups. • Destination IP Group - Click +Add to select an IP group. Country Object –Allows selection of predefined Country Objects. • Destination Country Object – Select the object.
Protocol	Specify the protocol(s) which this filter rule will apply to. • Any • Service Object • TCP/UDP • TCP • UDP • ICMP • ICMPv6 • IGMP • Others
Service Type Object	It is available when Service Object is set as the Protocol. Click +Add to select the service type objects (up to 12) you want. 
Specify Source Port	It is available when TCP or UDP or TCP/UDP is set as the Protocol. Switch the toggle to enable / disable the port settings. Source Port – If enabled, please provide the starting and ending port values.
Destination Port	It is available when TCP or UDP or TCP/UDP is set as the Protocol. To define a port range, please provide the starting and ending port values.
Protocol Number	It is available when Others is set as the Protocol. Enter a value as the protocol number.
Fragment	Action to be taken for fragmented packets. • Don't care –No action will be taken towards fragmented packets. • Unfragmented –Apply the rule to unfragmented packets. • Fragmented – Apply the rule to fragmented packets. • Too Short – Apply the rule only to packets that are too short to contain a complete header.
Action	
Action	Action to be taken when packets match the rule. Pass - Packets matching the rule will be passed immediately.

	Block - Packets matching the rule will be dropped immediately.
Bypass Content Filter	Switch the toggle to enable the function. If enabled, Vigor router will perform the data transmission bypassing the content filter rules.
Enable Syslog	Switch the toggle to enable the recording the filter log onto SysLog.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click Apply to save the settings.



Select one of the existed IP filter profile, more options will appear.

Available settings are explained as follows:

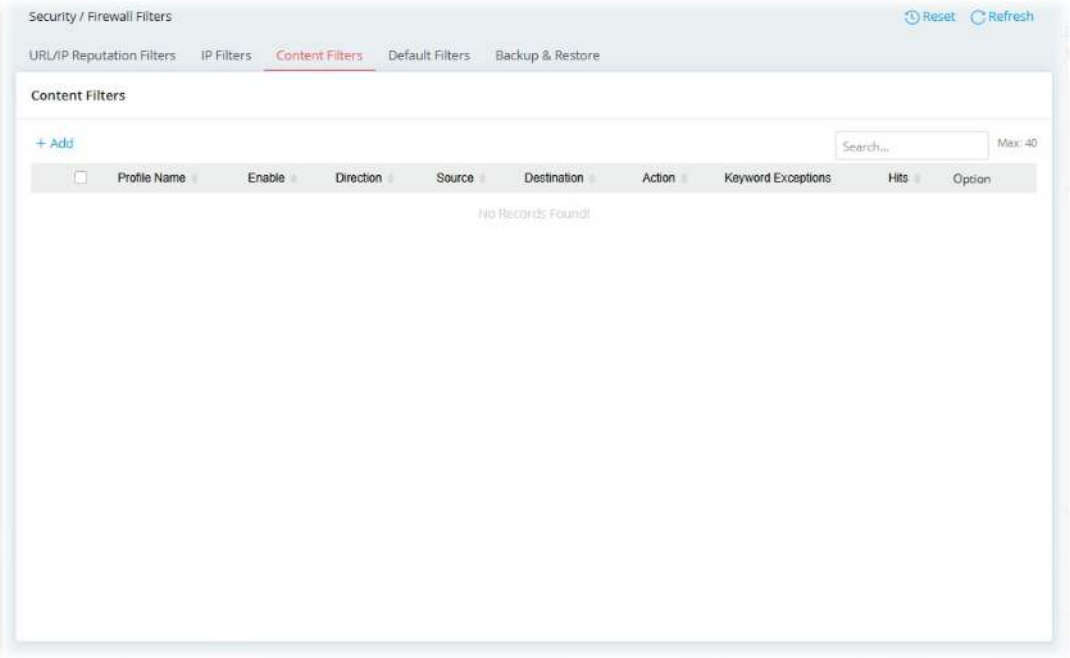
Item	Description
Clone	Duplicate the selected IP filter profile with a new name.
ResetHits	Reset the number of times that each IP rule has been matched when comparing packets to the default value.
MultipleDelete	When more than one IP filter profile is selected, click it to remove the items at one time.
MultipleEnable	When more than one IP filter profile is selected, click it to enable the profiles at one time.
MultipleDisable	When more than one IP filter profile is selected, click it to disable the profiles at one time.
Edit	Modify the selected IP filter profile.
Delete	Remove the selected IP filter profile.

II-2-1-3 Content Filters

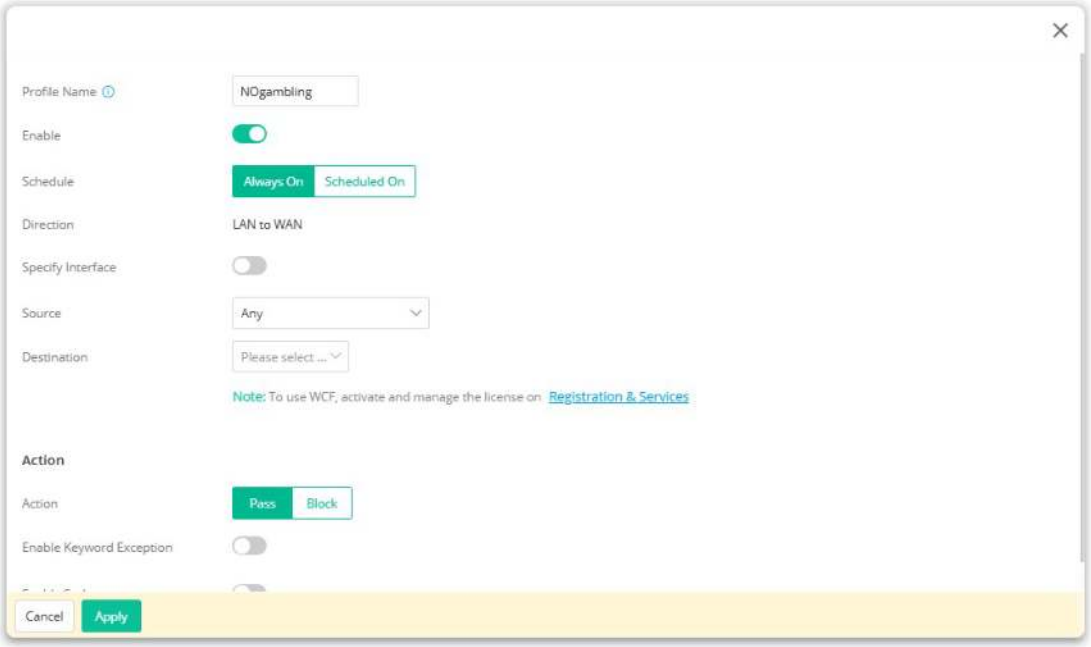
Content Filter includes APPE and WCF services. APPE is filtered by defined pattern. URL and WCF filters filter the servers to connect to by examining the server name in DNS request packets or TLS client hello packets.

This page allows you to configure up to 40 content filters profiles (including APPE, URL, and WCF) previously.

Vigor router will perform the payload (content) analysis for the packets in each session (LAN to WAN) based on the filter profiles defined in this page till to find out which content filter meeting the traffic.



To add a new content filter profile, click the **+Add** link to get the following page.



Available settings are explained as follows:

Item	Description
Profile Name	Enter a name to identify the filter profile.
Enable	Switch the toggle to enable/disable this profile.
Schedule	Always On – This rule is enabled and active for always. Scheduled On - Select Schedule indexes to allow the rule to be enabled at specific times. You may choose up to 4 out of the 20 schedules in Configurations>>Objects>>Schedule. • Clear Session when Schedule is On - Select this option to clear existing sessions when the rule is changes is enabled by a schedule profile. All connections will be reset.
Direction	Display the direction of traffic flow to which this filter rule applies.
Specify Interface	Switch the toggle to enable/disable the function. If enabled, specify the interfaces for the traffic flow. Specified LAN – Select the LAN interface(s).
Source	Configure the source IP addresses. To set the IP address manually, please choose Any / IPv4 Address / IPv4 Subnet / IPv6 Address / IPv6 Subnet / IP Object / IP Group / MAC Object / MAC Group as the source and enter required information. Any – All IP addresses IPv4 Address–Enter the IP address. • Source IPv4 Address – Click +Add to enter the IP address. IPv4 Subnet–Enter the IP Address and the Subnet Mask. • Source IPv4 Subnet Address - Click +Add to enter the IPv4 address with a subnet mask. IPv6 Address–Enter the IPv6 address. • Source IPv6 Address – Click +Add to enter the IPv6 address. IPv6 Subnet–Enter the IPv6 Address and the prefix length. • Source IPv6 Subnet Address - Click +Add to enter the IPv6 address with a prefix length. IP Object–Allows selection of predefined IP Objects. • Source IP Object – Click +Add to select an IP object. IP Group –Allows selection of predefined IP Groups. • Source IP Group - Click +Add to select an IP group. MAC Object–Allows selection of predefined MAC Objects. • Source MAC Object – Click +Add to select an MAC object. MAC Group –Allows selection of predefined MAC Groups. • Source MAC Group - Click +Add to select an MAC group.
Destination	Select specific WCF and/or APPE and/or UCF (keyword object) profile to be included in the filter.
Action	
Action	Action to be taken when packets match the rule. Pass - Packets matching the rule will be passed immediately. Block - Packets matching the rule will be dropped immediately.
Enable Keyword Exception	Switch the toggle to enable/disable the function. Keyword Exceptions - Displays selected keyword objects. The system will check the sessions additionally with the selected

	keyword profile(s). If the session meets the keyword filter profile, the system will perform the action reversely.
Enable Syslog	Switch the toggle to enable the recording the filter log onto SysLog.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

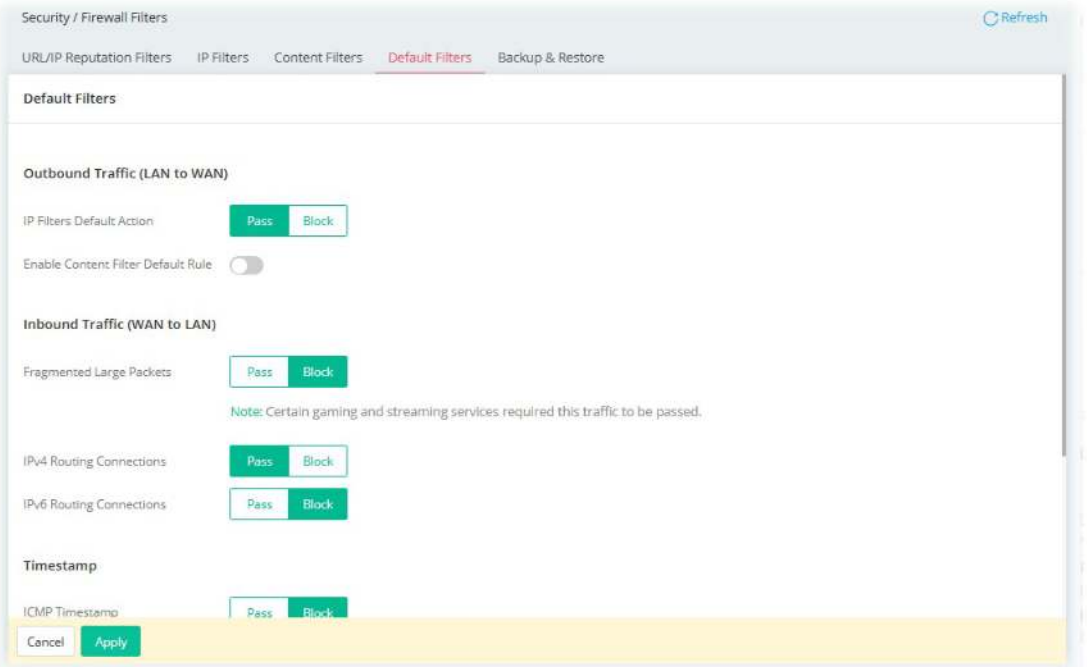
II-2-1-4 Default Filters

Traffic is filtered by firewall functions in the following order:

1. Data Filter Sets and Rules
2. Block connections initiated from WAN
3. Default Rule

This page allows you to choose filtering profiles including QoS, Load-Balance policy, WCF, APP Enforcement, URL Content Filter, for data transmission via Vigor router.

The default rule applies to all traffic that is not constrained by other filters or rules.



Available settings are explained as follows:

Item	Description
	Outbound Traffic (LAN to WAN)
IP Filters Default Action	Define the default action for the outgoing packets that do not match any IP filter rule. **Pass** –The packets that do not match any IP filter rule will be passed and next wait for the content filter. **Block** – The packets that do not match any IP filter rule will be blocked by Vigor system.
Enable Content Filters Default Rule	Switch the toggle to enable or disable the function.

Content Filters Default Rule	Define the default action for the outgoing traffic that match the following Content Destination rule. If the outgoing traffic doesn't match any IP/content filter rule and the IP Filters Default Action is PASS, it will be checked with this rule additionally. If the outgoing traffic meets the above conditions but still doesn't meet the following Content Destination rules, the system will perform the action reversely. Pass –The outgoing traffic that matches the following Content Destination rule will be passed. Otherwise, it will be blocked. Block – The outgoing traffic that matches the following Content Destination rule will be blocked. Otherwise, it will be allowed to pass through.
Content Destination	Select specific WCF and/or APPE and/or UCF(keyword object) profile to be included in the filter.
Inbound Traffic (WAN to LAN)	
Fragmented Large Packets	Certain games and video streaming service use fragmented UDP packets to transfer data. Pass - The router always passes fragmented packets without reassembling them, regardless of the size of the packet. Block - The router will attempt to reassemble fragmented packets up to a certain value (e.g., 15xx~2102) kilobytes long. Packets larger than the certain value will be discarded.
IPv4 Routing Connections	Pass – For LAN hosts receiving WAN IPv4 addresses using the IP routed subnet, select this option to prevent WAN hosts from connecting to LAN hosts. This option has no effect on LAN hosts on private LAN subnets. Block - Block the LAN hosts from connecting to WAN hosts using IPv4.
IPv6 Routing Connections	Pass – IPv6 does not make use of Network Address Translation (NAT), so all LAN hosts receive public IPv6 IP addresses that are exposed to the WAN. Block - Block the WAN hosts from connecting to LAN hosts using IPv6.
Timestamp	
ICMP Timestamp	Protocols that expose system time information may unintentionally reveal predictable external information. To minimize this risk, it is recommended to block ICMP Timestamp message types if required. Pass – Allow the ICMP Timestamp messages packets to pass through the interface. Block – Drop the ICMP Timestamp messages packets to prevent potential information disclosure.
TCP Timestamp	The TCP Timestamp may expose system uptime, which could assist attackers inferring timing information. To minimize this risk, it is recommended to block TCP Timestamp options if required. Pass – Allow the TCP Timestamp message packet types passing through the interface. Block - Block the TCP Timestamp message to prevent potential

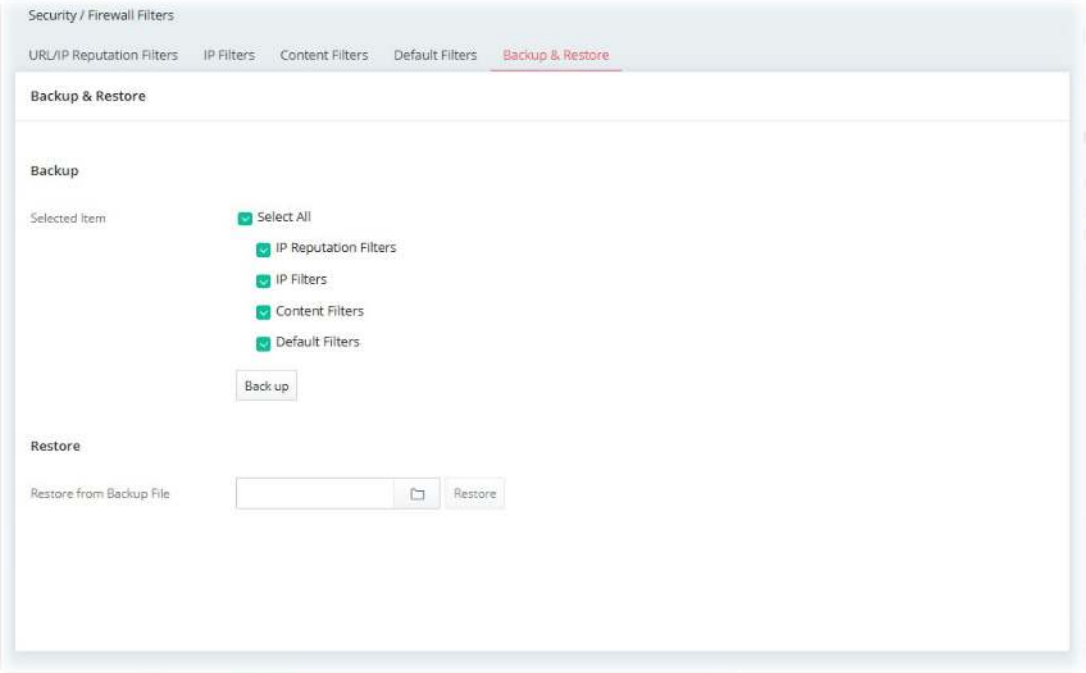
	information disclosure.
Syslog	Enable Syslog – If enabled, the log related to default filter will be recorded to Syslog.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

II-2-1-5 Backup & Restore

This page allows the backup and restoration of router settings.

In addition to restoring Vigor2928's own configuration backup, it is possible to restore backups from certain DrayTek routers on Vigor2928.



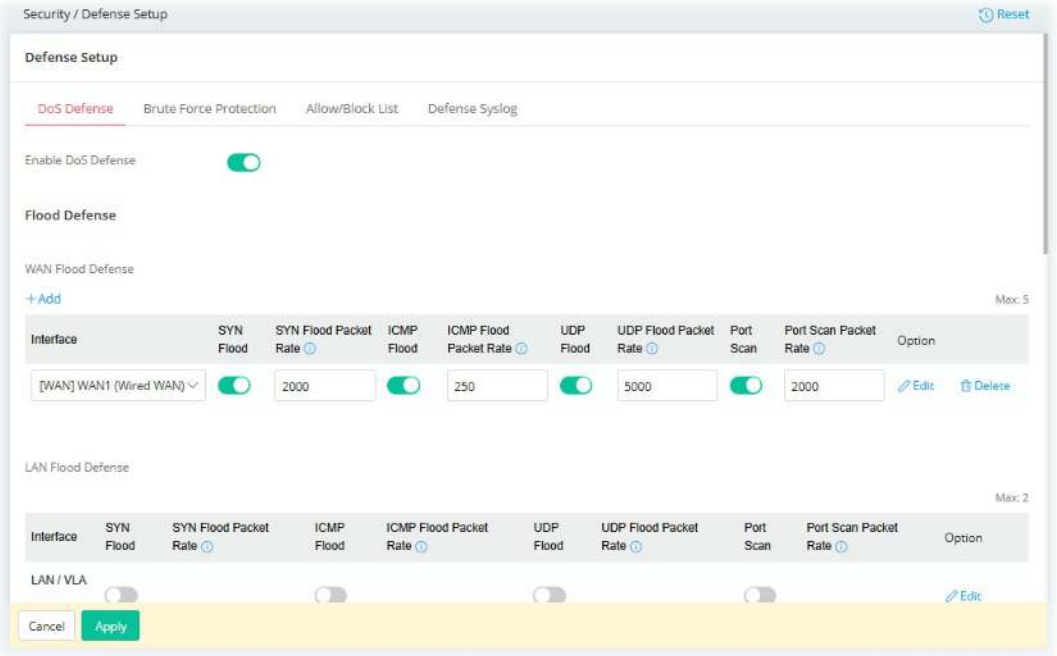
Available settings are explained as follows:

Item	Description
Backup	Selected Items – Select the item(s). Backup - Perform the configuration backup of this router based on the item (Selected All, IP Filters, Content Filters and Default Filters) selected above.
Restore	Restore from Backup File – Click the button to specify a file to be restored Restore - Click to initiate restoration of configuration. If the backup file is encrypted, you will be asked to enter the password.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

II-2-2 Defense Setup

II-2-2-1 DoS Defense

As a sub-functionality of IP Filter/Firewall, there are several types of detect / defense function in the DoS Defense setup. In default, the DoS Defense is disabled.



Available settings are explained as follows:

Item	Description
Enable DoS Defense	Switch the toggle to enable/disable the DoS Defense.
	Flood Defense
WAN Flood Defense	+Add – Click it set profiles for flood defense. Up to 6 profiles can be created. Interface – Select a WAN interface. Set the packet rate values for WAN to meet your request. SYN Flood – Switch the toggle to enable/disable SYN flood defense. When the arrival rate of SYN packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. This is to prevent TCP SYN packets from exhausting router resources. • SYN Flood Packet Rate – The default values of threshold and timeout are 2000 packets per second and 10 seconds, respectively. ICMP Flood – Switch the toggle to enable/disable the ICMP flood defense. When the arrival rate of ICMP packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. • ICMP Flood Packet Rate – The default values of threshold and timeout are 250 packets per second and 10 seconds, respectively. UDP Flood – Switch the toggle to enable/disable UDP flood

	defense. When the arrival rate of UDP packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. • UDP Flood Packet Rate – The default values of threshold and timeout are 5000 packets per second and 10 seconds, respectively. Port Scan – Switch the toggle to enable/disable the Port Scan detection. Port Scans attack your network by sending packets to a range of ports in an attempt to find services that would respond. When Port Scan detection is enabled, the router sends warning messages when it detects port scanning activities that exceed the Threshold rate. • Port Scan Packet Rate – The default threshold is 2000 packets per second. Option (Edit/Delete) – Click Edit to open the setting page to modify in detail (packet rate and burst rate). Click Delete to remove the selected entry.
LAN Flood Defense	Interface – It contains LAN/VLAN and VPN. In which the default packet rate values for LAN/VLAN are the same as WAN flood defense, and will take effect for all LAN interfaces within a VLAN. The packet rate values for VPNs will be effective for LAN interfaces used for VPN. Set the packet rate values for LAN/VLAN and VPN accordingly. SYN Flood – Switch the toggle to enable/disable SYN flood defense. When the arrival rate of SYN packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. This is to prevent TCP SYN packets from exhausting router resources. • SYN Flood Packet Rate – The default values of threshold and timeout are 2000 packets per second and 10 seconds, respectively. ICMP Flood – Switch the toggle to enable/disable the ICMP flood defense. When the arrival rate of ICMP packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. • ICMP Flood Packet Rate – The default values of threshold and timeout are 250 packets per second and 10 seconds, respectively. UDP Flood – Switch the toggle to enable/disable UDP flood defense. When the arrival rate of UDP packets exceeds the Threshold value, the router will start to randomly discard TCP SYN packets for a period of time as defined in Timeout. • UDP Flood Packet Rate – The default values of threshold and timeout are 5000 packets per second and 10 seconds, respectively. Port Scan – Switch the toggle to enable/disable the Port Scan detection. Port Scans attack your network by sending packets to a range of ports in an attempt to find services that would respond. When Port Scan detection is enabled, the router sends warning messages when it detects port scanning activities that exceed the Threshold rate. • Port Scan Packet Rate – The default threshold is 2000 packets per second. Option (Edit/Delete) – Click Edit to open the setting page to modify in detail (packet rate and burst rate). Click Delete to

	remove the selected entry.
General	Switch the toggle to enable/disable the function listed below. **Block IP Options** – If enabled, the Vigor router will ignore IP packets with IP option field set in the datagram header. IP options are rarely used and could be abused by attackers as they carry information about the private network otherwise not available to the external network, such as security, TCC (closed user group) parameters, a series of Internet addresses, routing messages, etc, which external eavesdroppers can use to discover details about the private network. **Block Land** – Enable to block LAND attacks. LAND attacks happen when an attacker sends spoofed SYN packets with both source and destination addresses set to that of the target system, which causes the target to reply to itself continuously. **Block SMURF** – Enable to block Smurf attacks. The router will ignore any broadcasting ICMP echo request. **Block Trace Route** – Enable to block traceroutes. The router will not forward traceroute packets. **Block SYN Fragment** – Enable to block SYN packet fragments. The router will drop any packets having both the SYN and more-fragments bits set. **Block Fraggle** – Enable to block Fraggle Attacks. Broadcast UDP packets received from the Internet are blocked. Activating this feature might block some legitimate packets. Since all broadcast UDP packets coming from the Internet are blocked, RIP packets from the Internet could also be dropped. **Block Tear Drop** – Enable to block Tear Drop attacks. Some clients may crash when they receive ICMP datagrams (packets) that exceed the maximum length. The router discards any fragmented ICMP packets having lengths greater than 1024 octets. **Block Ping of Death** – Enable to block Ping of Death, where fragmented ping packets are sent to target hosts so that those hosts could crash as they reassemble the malformed ping packets. **Block ICMP Fragment** – Enable to block ICMP Fragments. ICMP packets with the more-fragments bit set are dropped. **Block Unknown Protocol** – Enable to block Unassigned Protocol Numbers, and the router will block packets having unassigned protocol numbers. Individual IP packet has a protocol field in the datagram header to indicate the protocol type running over the upper layer. However, the protocol types greater than 100 are reserved and undefined at this time. Therefore, the router should have ability to detect and reject this kind of packets.
	ARP Spoofing Defense
Block ARP replies with	This feature can protect a network from ARP (Address Resolution Protocol) spoofing attacks. **Inconsistent Source MAC addresses** – If the sender's MAC address in the ARP packets does not match the source MAC address from ARP packet's ethernet header, the Vigor system will block the packets immediately. **Inconsistent Destination MAC addresses** - If the target MAC address in the ARP packets does not match the destination MAC address from ARP packet's ethernet header, the Vigor system will block the packets immediately.

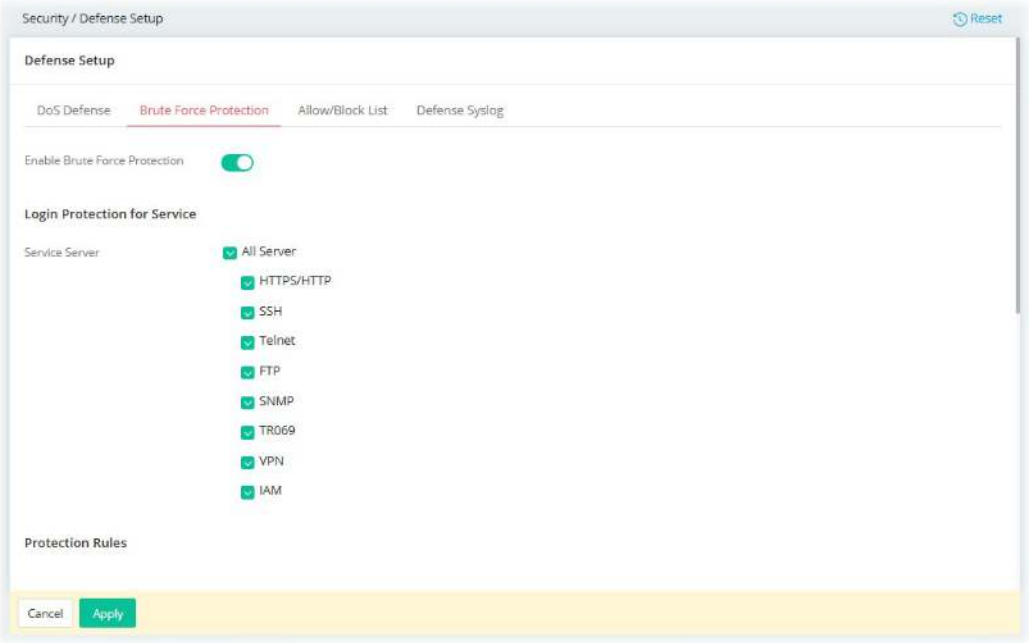
Virtual MAC Address in ARP Table (VRRP)	Accept – The virtual MAC address can be recorded in the ARP table. Decline –The virtual MAC address cannot be recorded in the ARP table.
IP Spoofing Defense	
Block IP Packets with	IP spoofing defense can prevent unauthorized access and then protect the data integrity to make sure the security of network. Inconsistent Source IP addresses from WAN – Blocks the fake IP from WAN. For example, if the source IP address from the WAN interface is LAN subnet IP packets, the Vigor system will block the packets immediately. Inconsistent Source IP addresses from LAN – Blocks the fake IP from LAN. For example, if the source IP address from the LAN interface is WAN subnet IP packets, the Vigor system will block the packets immediately.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click Apply to save the settings.

II-2-2-2 BFP Settings

BFP is the abbreviation of Brute Force Protection.

Any client trying to access into Internet via Vigor router will be asked for passing through user authentication. Such feature can prevent Vigor router from attacks when a hacker tries every possible combination of letters, numbers and symbols until find out the correct combination of password.



Available settings are explained as follows:

Item	Description
Enable Brute Force Protection	Switch the toggle to enable or disable the detection of brute force login attempts.

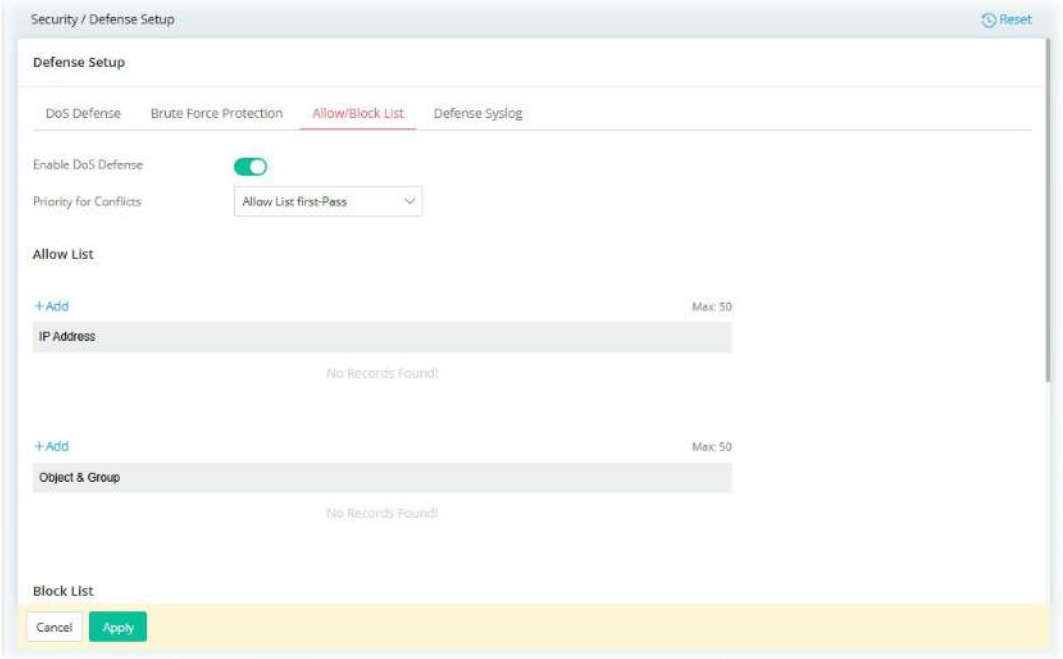
Login Protection for Service	
Service Server	BFP can protect the Vigor router's login feature from hacker attacks attempting to crack accounts and passwords through protocols such as HTTPS/HTTP, SSH, Telnet, FTP, SNMP, TR-069, VPN, IAM, and more. The default setting is **All Server**.
Protection Rules	
IAM Users	Define the protection rules for IAM users (e.g., using FTP and IAM service. **Enable** –Switch the toggle to enable or disable the defense setup settings for the IAM users. **Maximum Login Attempts** – Specify the maximum number of failed login attempts before further login is blocked. The users who fail to log in multiple times by reaching the maximum login attempts will be penalized a period not to login Vigor system (e.g., using FTP and IAM Service). **Penalty Period** – Set the period for penalty delay. During this period, the user cannot log in. This setting aims to prevent outside automated attacks that attempt to guess passwords, authentication codes, or other credentials through repeated trials. **Enable User Account Lockout** – Switch the toggle to enable or disable the IAM users account lockout function. **Login Attempts** – Set a maximum number of failed login attempts for all user accounts. After reaching this limit, the IAM user account will be locked if login fails (e.g., through FTP or IAM Service). **Unlock User Account After** – Set a time period to unlock specific IAM user accounts. **Email Notification** – Send a notification to the account via an e-mail when lockout event happened to the user.
VPN	Define the protection rules for VPN connection. **Enable** –Switch the toggle to enable or disable the defense setup settings for the VPN connection. **Maximum Login Attempts** – Specify the maximum number of failed login attempts before further login is blocked. The users who fail to log in multiple times by reaching the maximum login attempts will be penalized a period not to login Vigor system. **Penalty Period** – Set the period for penalty delay. During this period, the user is unable to log in or access Vigor's system. This setting aims to prevent outside automated attacks that attempt to guess passwords, authentication codes, or other credentials through repeated trials. **Email Notification** - Send a notification to the account via an e-mail when lockout event happened to the user.
System Account	Define the protection rules for the system account (User and Administrator). **Enable** – Switch the toggle to enable or disable the defense setup settings for the system account. **Maximum Login Attempts** – The System Accounts who fail to log in multiple times by reaching the maximum login attempts will be

	penalized a period not to login Vigor system (e.g., using HTTPS/HTTP, SSH, Telnet, SNMP, and TR069 Service). Penalty Period – Set the period for penalty delay. During this period, the user is unable to log in or access Vigor's system. This setting aims to prevent outside automated attacks that attempt to guess passwords, authentication codes, or other credentials through repeated trials. Enable User Account Lockout –Switch the toggle to enable or disable the System Account lockout function. Login Attempts – Specify the maximum number of failed login attempts for all System Accounts. After that, the System Accounts will be locked if login failed (e.g., logging into HTTPS/HTTP, SSH, Telnet, SNMP, and TR-069 Service). Unlock User Account After – Specify a time period to unlock specific system account. Email Notification - Send a notification to the account via an e-mail when lockout event happened to the user.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click Apply to save the settings.

II-2-2-3 Allow/Block List

Define the white list and the black list for the clients.



Available settings are explained as follows:

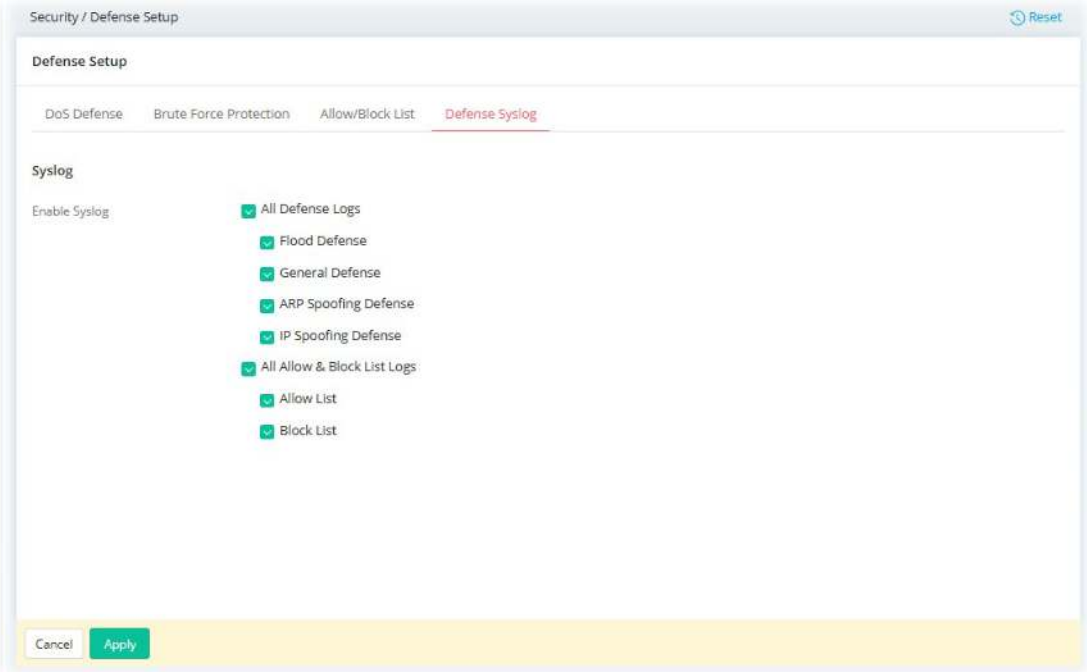
Item	Description
Enable DoS Defense	Switch the toggle to enable or disable the DoS Defense function.
Priority for Conflicts	Define the processing order/priority for the conflicts. • Allow List first-Pass – Let the IP address listed on the Allow List pass through first.

	• **Block List first-Block** – Block the IP address listed on the Block List pass through first.
Allow List	Define the IP address(es) of the clients that the packets can be received / delivered via Vigor router. **+Add** – Click to add a new IP address as the member within the allow list. • **IP Address** – Enter the IP address. **+Add** – Click to add a new object / group as the member within the allow list. • **Object & Group** – Use the drop-down list to specify the object & group profile.
Block List	Define the IP address(es) of the clients that will be blocked by Vigor router. **+Add** – Click to add a new IP address as the member within the allow list. • **IP Address** – Enter the IP address. **+Add** – Click to add a new object / group as the member within the allow list. • **Object & Group** – Use the drop-down list to specify the object & group profile.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

II-2-2-4 Defense Syslog

Display the type of Syslog provided by Vigor router. Corresponding information related to operation, status, and defense to Vigor router will be recorded to the Syslog server.



Available settings are explained as follows:

Item	Description
Enable Syslog	Select the feature(s). Operation procedure, result or any information related to the feature will be recorded to the Syslog server.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

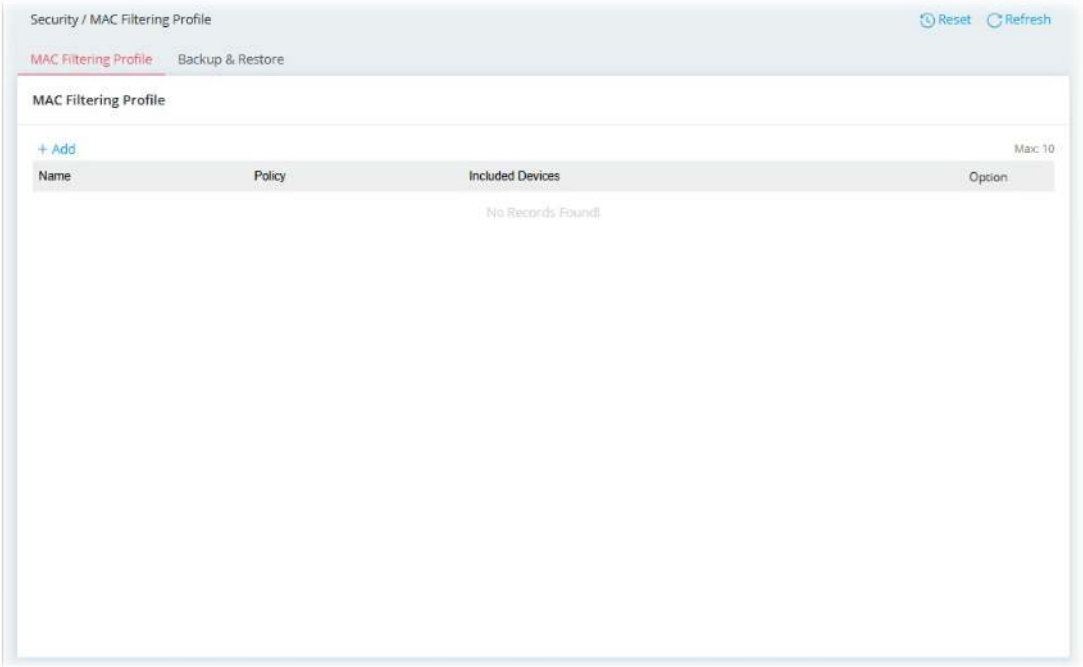
II-2-3 MAC Filtering Profile

Vigor router may restrict wireless access to specified wireless clients only by referencing a MAC address black/white list.

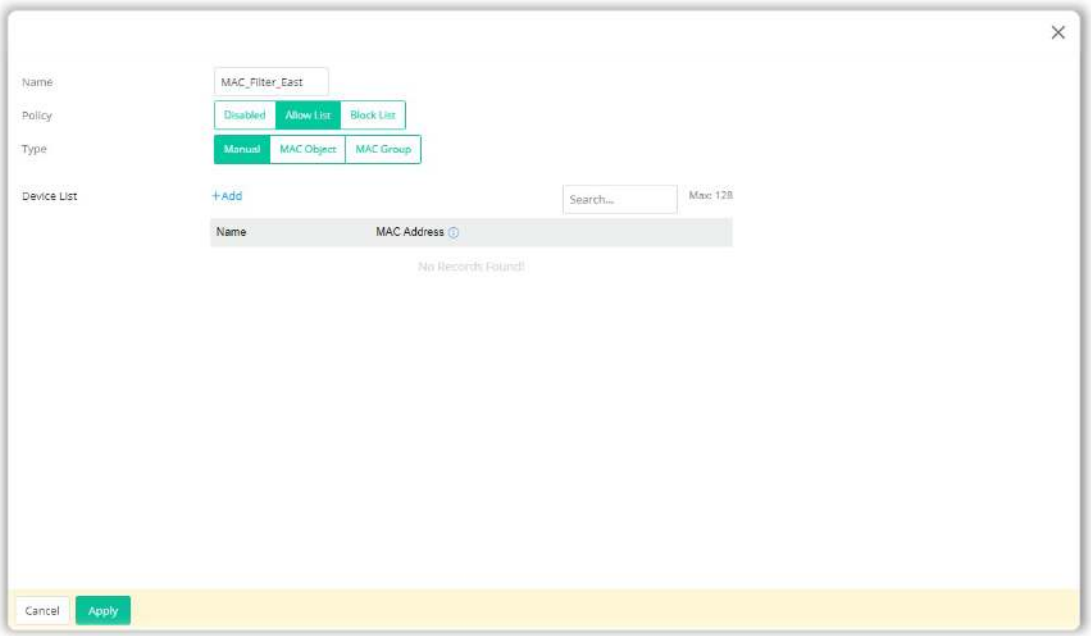
The router's administrator may block wireless clients by inserting their MAC addresses into a black list, or only allow some wireless clients to connect by inserting their MAC addresses into a white list.

II-2-3-1 MAC Filtering Profile

This page allows to set the MAC Filtering Profiles (up to 10) that will be applied to SSID (configured on Configuration>>Wireless LAN>>SSID) to meet different needs.



To add a new profile, click +Add.



Available settings are explained as follows:

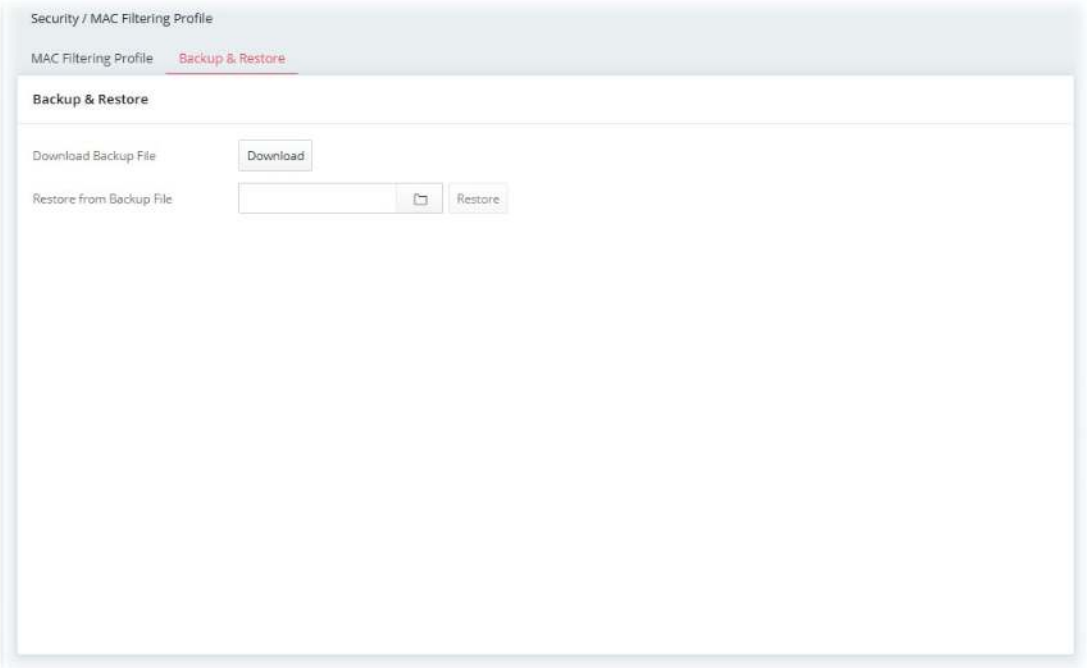
Item	Description
Name	Enter a string as the profile name.
Policy	Disabled – Disable this policy. Allow List – Only allow wireless clients whose MAC addresses are listed in the Device list. Block List - Only allow wireless clients whose MAC addresses are not listed in the Device list.
Type	Determine which wireless clients can be applied to SSID. Manual – Enter the MAC address of certain device one by one. MAC Object – Select the MAC object(s). All the MAC address under

	the MAC object will be allowed or blocked. MAC Group – Select the MAC group(s). All the MAC objects under the MAC group will be allowed or blocked.
Device List	+Add – Click to add a new device by entering the device name and the MAC address.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

II-2-3-2 Backup & Restore

This page allows the backup and restoration of MAC filtering profile settings.

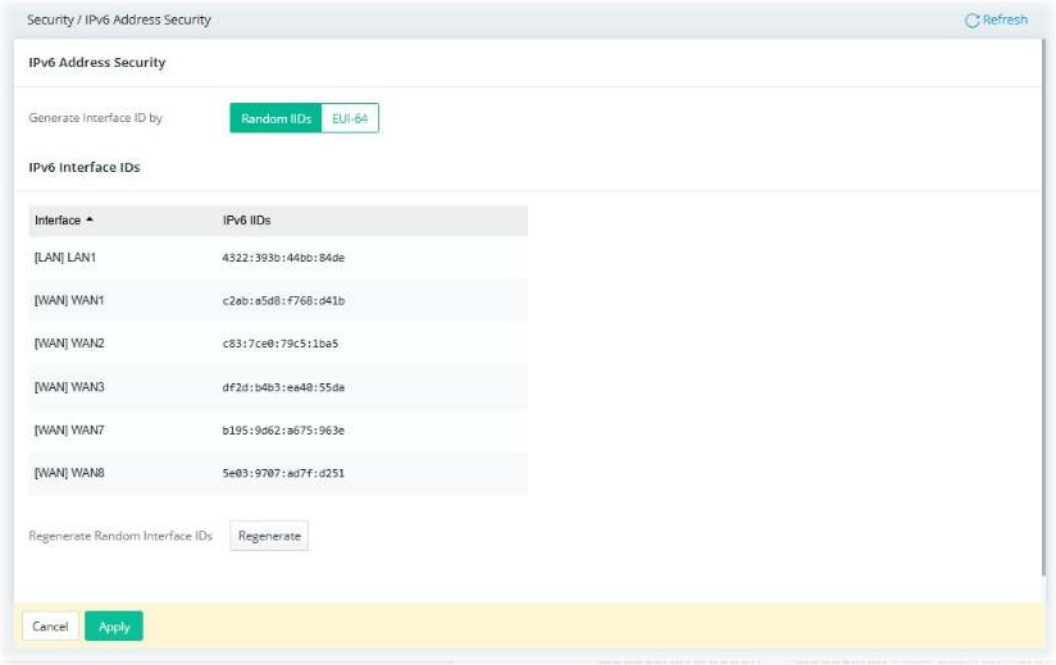


Available settings are explained as follows:

Item	Description
Download Backup File	Click to save current configurations for MAC Filtering Profile.
Restore from Backup File	- Click to locate the file for restoring. Restore – Click to execute the restoration.

II-2-4 IPv6 Address Security

This page allows you to configure the IPv6 interface ID.



Available settings are explained as follows:

Item	Description
Generate Interface ID by	Select to use Random IIDs or EUI-64 IIDs as the interface ID. • Random IIDs • EUI-64
IPv6 Interface IDs	Display the interface and corresponding IPv6 IIDs.
Regenerate Random Interface IDs	Regenerate - Re-generate the random IIDs for all interfaces.
Cancel	Discard current settings.
Apply	Save the current settings.

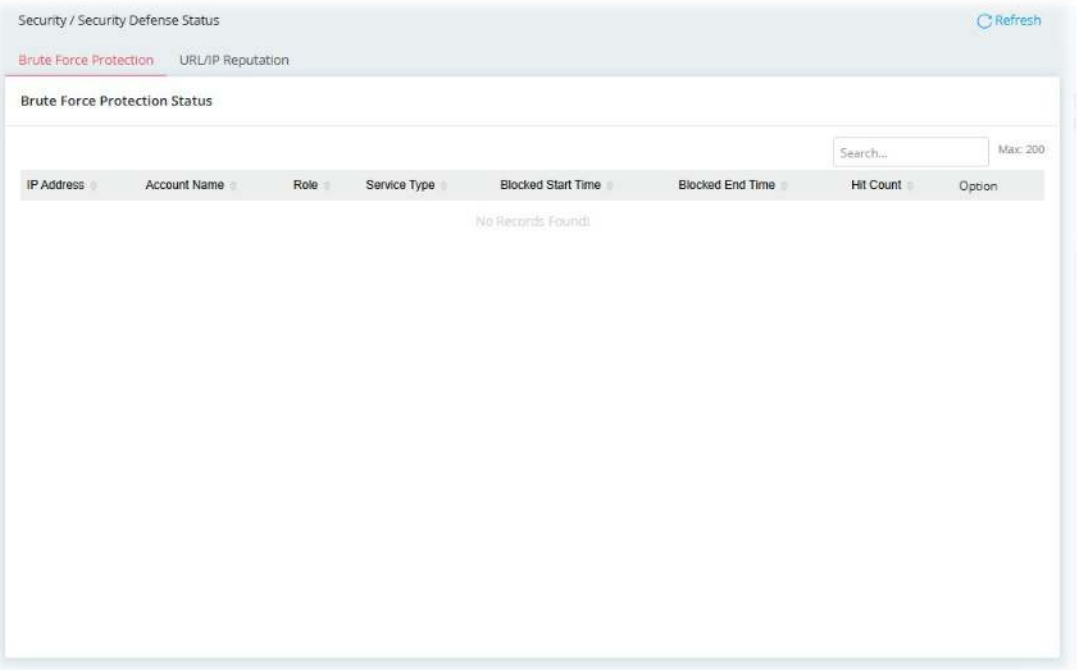
After finishing this web page configuration, please click Apply to save the settings.

II-2-5 Security Defense Status

The router's current security protection mechanisms include Brute Force Protection and IP Reputation. This page provides details on the status of these protection mechanisms.

II-2-5-1 Brute Force Protection

This page shows the status of Brute Force Protection.

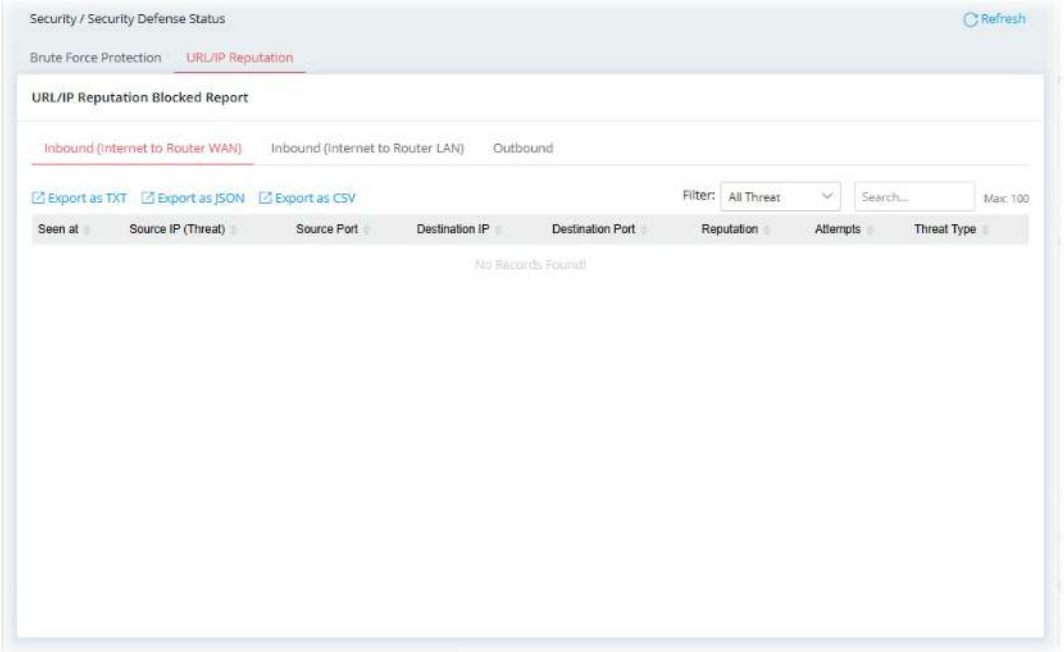


Available settings are explained as follows:

Item	Description
IP Address	Displays the IP addresses that have been blocked due to triggering the Penalty or User Account Lockout function when using a System Account (e.g., logging into HTTPS/HTTP, SSH, Telnet, SNMP, and TR-069 Service
Account Name	Displays the account names that have been blocked due to triggering the Penalty or User Account Lockout function when using a System Account (e.g., logging into HTTPS/HTTP, SSH, Telnet, SNMP, and TR-069 Service.
Role	Displays the role of the account.
Service Type	Displays the service type set for the user account.
Blocked Start Time / Blocked End Time	Displays both the start and end times for blocking the IP address.
Hit Count	Displays the number of times a System Account has triggered the Penalty or User Account Lockout.
Option	Unblock – Click to remove the blocked IPs. Add to Block List - Add IPs to the Defense Setup's Allow/Block List.

II-2-5-2 IP Reputation

This page displays the IP Reputation status for the Vigor router regarding both inbound and outbound traffic.

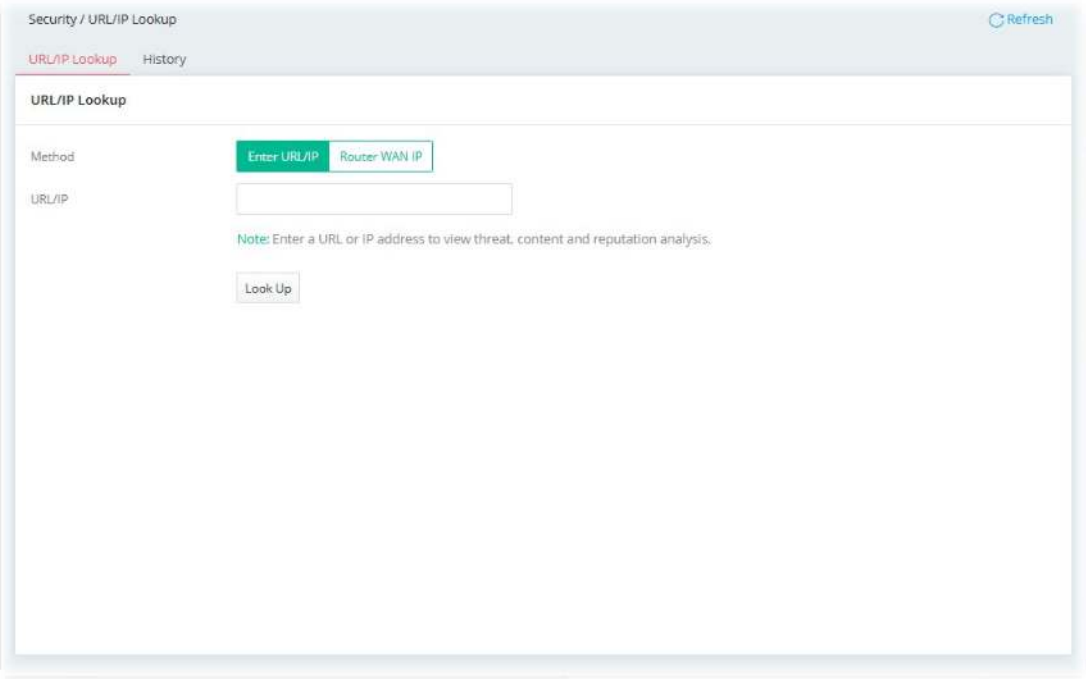


Available settings are explained as follows:

Item	Description
Export as TXT/JSON/CSV	Export the IP reputation settings with the file format of TXT, JSON, or CSV.
Seen at	Displays the time when the packet matches the specified rule.
Source IP (Threat)	Displays the IP address of the source of the threat.
Source Port	Displays the port number of the source IP.
Destination IP	Displays the IP address of the destination to which the threat is directed.
Destination Port	Displays the port number of the destination IP.
Reputation	Displays the score of the IP address.
Attempts	Displays the times of attempts made by the threat towards the target destination.
Threat Type	Displays the type of the threat.

II-2-6 URL/IP Lookup

This page allows you to view various score of specified IP or URL, click the Look Up button to see the relevant information. After analysis, the Vigor system will provide relevant information about the IP/URL, including risk level, reputation score, category, and more.

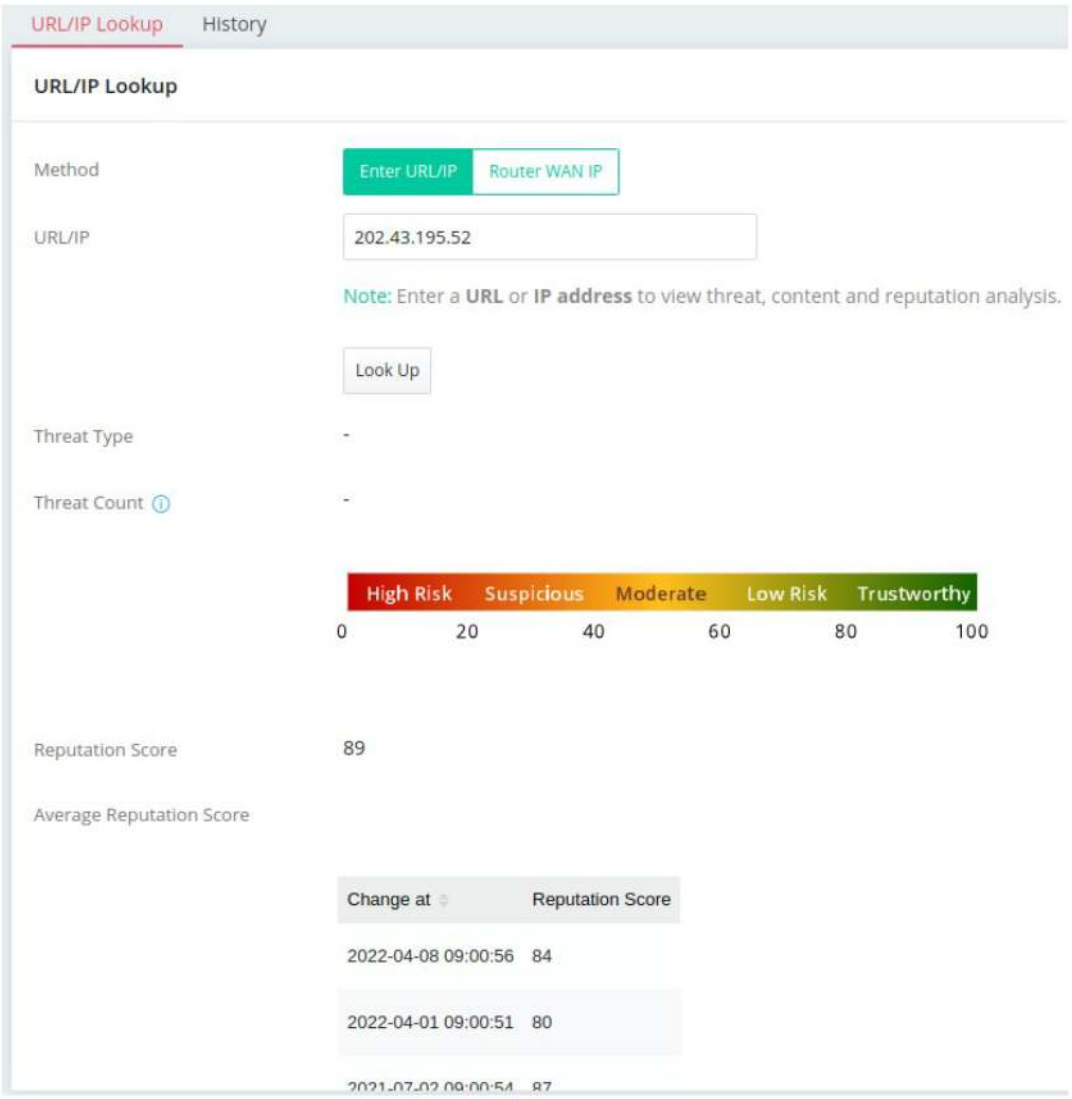


Available settings are explained as follows:

Item	Description
Method	Enter URL/IP – Select this method to look up using URL or IP address. • URL/IP - Enter the URL or the IP address of the subject you want to look up. Router WAN IP – Select this method to look up through WAN interface.
Look Up	Click to display information related to the IP/URL you look up. In which, the relevant information associated, see below, with the IP address will be shown on the page. • Threat Type • Threat Count • Reputation Score • Average Reputation Score • Organization • Location • Latitude • Longitude Or, enter the name of the URL. The relevant information associated with the URL will be shown on the page. • Reputation Score • Category • Category Confidence • Popularity

	• Name Servers • Registrar Name • Created Date • Expired Date • Organization • Location

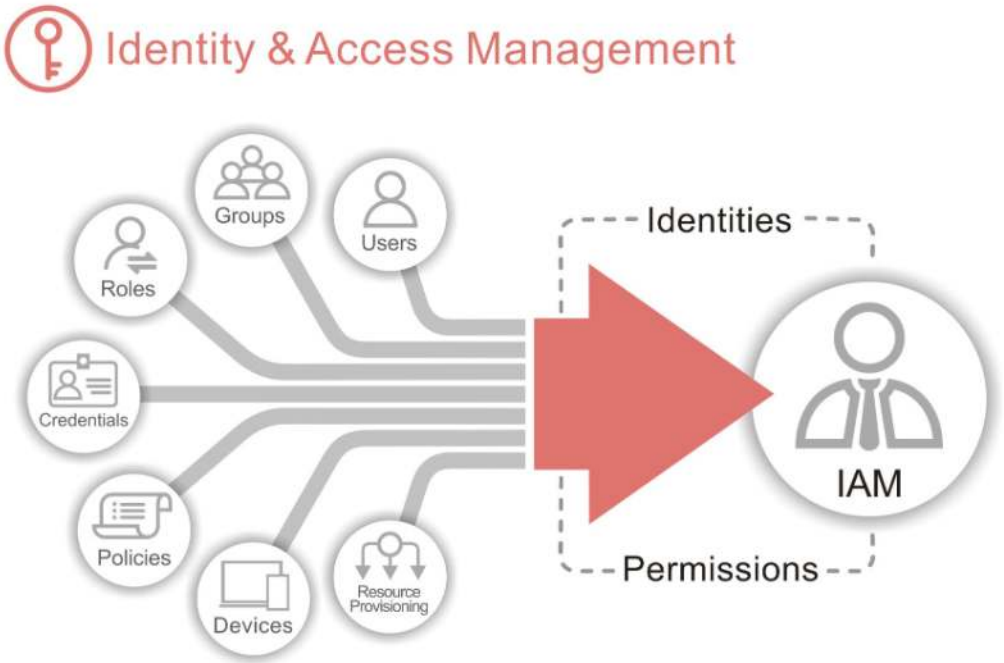
Below shows an example of look up IP/URL:



II-3 IAM

Identity and Access Management (IAM) allows the network administrator to manage Internet access at the user level. After a user has been authenticated using a username and password, the user will be granted Internet access and additionally, optional firewall rules and LAN access policies can be applied.

In addition to being used for identification (via user account/VLAN), IAM can also set access policies to control users accessing network, and can be used as a firewall through group policy (group policy) to perform network management.



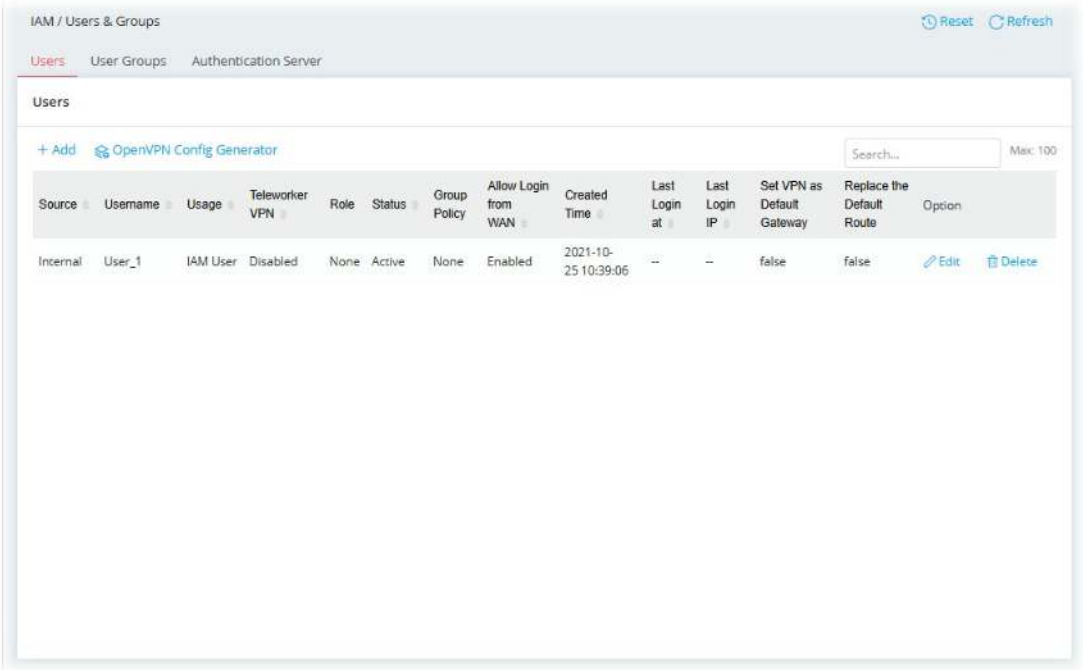
II-3-1 Users & Groups

Before accessing the Internet through the device, any user must be authenticated by the Vigor system to ensure system security.

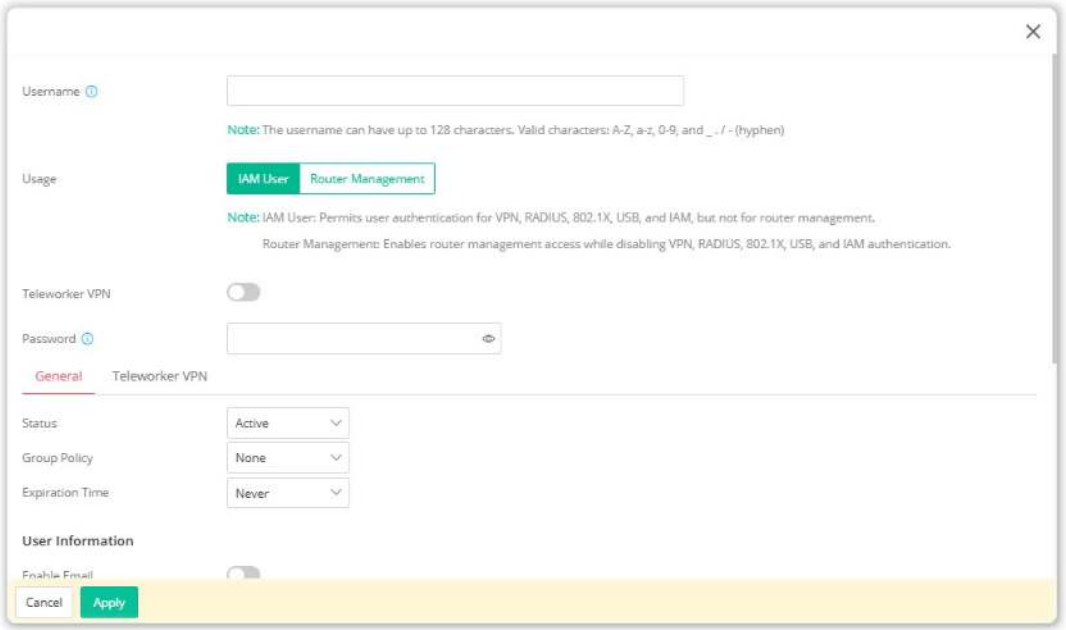
This section helps the system administrator create different users and groups profiles as the verification basis.

II-3-1-1 Users

Up to 100 user profiles can be configured in this section.



To add a new user account profile, click +Add.



Available settings are explained as follows:

Item	Description
Username	Enter the Login name (e.g., *LAN_User_Group_1, WLAN_User_Group_A, WLAN_User_Group_B,* etc.) for this user profile.
Usage	Define the type of this user profile. IAM User – This profile can be used for VPN, RADIUS, 802.1X, USB and IAM (Identity and Access Management) authentication. Router Management – This profile is only for router management access and cannot be used for VPN, RADIUS, 802.1X, USB, and IAM authentication.
Teleworker VPN	It is available if IAM User is selected as the Usage.

	Switch the toggle to enable or disable the Teleworker VPN function.
Password	It is available if IAM User is selected as the Usage. Password (e.g., *lug123, wug123, wug456,* etc.) for this user profile. When a user tries to access the Internet, he or she must supply a valid user name and password combination for authentication. The profile with matching user name and password will be applied to the session.
New Password/ Confirm New Password	It is available if Router Management is selected as the Usage. Password (e.g., *lug123, wug123,wug456,* etc.) for this user profile. When a user tries to access the Internet, he or she must supply a valid user name and password combination for authentication. The profile with matching user name and password will be applied to the session.
General (if IAM User is selected as the Usage)	
Status	Active – Enable the general settings in this page. Inactive – Disable the general settings in this page.
Group Policy	It is available if "IAM User" is selected as the usage. Select a group policy profile to be applied by this user profile.
Expiration Time	It is available if "IAM User" is selected as the usage. Set the network connection to work at certain time interval only. All user accounts will apply the time configuration automatically by default. Never – The network connection is always on. Expire in –The network connection will expire and terminate the connection after specified minutes, hours, days, or weeks once built. Expire at – The network connection will expire and terminate the connection on the date and time specified below once built. • Date • Time • Expiration Time
User Information	Enable Email – Switch the toggle to enable or disable the email setting. • Email – Enter the email address for receiving the MFA PIN code. • Send Email Notification to the newly created User – Send a notification email to this user account. Enable SMS – Switch the toggle to enable or disable the SMS setting. • SMS - Enter the destination SMS number for receiving the MFA PIN code.
MFA & Port Knocking	Multi-factor authentication (MFA) can offer a more secure network connection. Enable MFA – Switch the toggle to enable/disable the MFA function. • Allowed MFA Method - Select to require TOTP, SMS or email authentication when logging in from the WAN. TOTP –For the Time-based One-time Password (TOTP)

	mechanism, please make sure the time zone of your router is correct. Then, install Google Authenticator APP on your cell phone. Open the APP to scan the QR code on this page. A one-time password will be shown on your phone. Select TOTP and click Apply. A pop-up dialog will appear as follows:  In the filed of Validation Code, enter the one-time password and click Verify. Now, the configuration is finished. You will be asked to enter the 2FA code on the after passing the username and password authentication. SMS/Email –The password will be sent via SMS or email as selected in the User Information above. ● Enforce Port Knocking – Switch the toggle to enable/disable the Port Knocking function. 1st Knock Port - Enter a value (3001~59999). Click the (!) mark to have more information. TOTP Secret – Display the secret used for TOTP.
Account Info	Displays general information (created time, last login at and last login IP) for the user account.
	Teleworker VPN (if IAM User is selected as the Usage)
General	Idle Timeout – If the user is idle over the limitation of the timer, the network connection will be stopped for this user. By default, the Idle Timeout is set to 300 seconds. VPN Schedule – Select Always On (Telework VPN is running all the time). Or choose Scheduled On to make the VPN connection based on the schedule. Before configuring VPN Schedule, add the required time intervals in Configuration>>Objects >>Schedule. Download SmartVPN Client - Click to download the utility of DrayTeck SmartVPN client for building VPN connection.
Allowed VPN Protocols	Select IPsec, WireGuard or OpenVPN as the protocol for the teleworker VPN connection. IPsec – Switch the toggle to enable the IPsec protocol. If enabled, select IKEv1/v2, EAP and/or XAuth as the IPsec protocol. OpenVPN - Switch the toggle to enable OpenVPN protocol. WireGuard –Switch the toggle to enable WireGuard protocol. If enabled, configure the following settings: ● Public Key – Enter the string offered by the remote

	WireGuard VPN client. • Pre-Shared Key – Displays the private key generated by clicking Generate PSK. • Generate PSK – Click the Generate button to generate a pre-shared key. • Persistent Keepalive – Default is 60 seconds. If the peer is behind a NAT or a firewall, use the default setting. L2TP –Switch the toggle to enable L2TP protocol. If enabled, configure the following settings: • L2TP with IPsec Policy – Select one policy.
WireGuard Settings	It is available when the WireGuard is selected as the Allowed VPN Protocols. Generate Key Mode – Select Auto or Customized. Generate Key Pair – Click to generate the client private key and the client public key automatically. Client Public Key – Enter the string offered by the remote WireGuard VPN client. Pre-Shared Key – Displays the private key generated by clicking Generate PSK. Generate PSK – Click the Generate PSK button to generate a pre-shared key. Persistent Keepalive – Default is 60 seconds. If the peer is behind a NAT or a firewall, use the default setting.
Security	Specify VPN Peer – Switch the toggle to enable/disable the security mechanism for the remote client. • Remote Client IP – Enter the IP address of the remote peer if Specify VPN Peer is enabled. • Pre-Shared Key – It is available when the IPsec is selected as the Allowed VPN Protocols. "Specify VPN Peer" can restrict the IPsec to be initiated only by the specified peer IP address or domain name, and specify the private key to be used. X.509 Digital Signature - It is available when the IPsec is selected as the Allowed VPN Protocols. Accept the certificates authentication. To use an X.509 digital signature, select one of the authentication methods and enter the required information for each method. • Disabled – Select to disable the certificate application for VPN connection. • Accept Subject Alternative Name –The following three formats of Peer ID are acceptable, including IP Address, Domain Name, and Email. • Select from Existing Certificates –Select a peer certificate that has been pre-obtained and stored in Configuration>>Certificates Local Certificates. • Accept Subject Name – Enter the complete certificate subject name. • Accept Any – Any certificate signed by a trusted CA in Configuration>>Certificates Trusted CA will be considered valid.
Local IP Assignment	Assign IP By – Select LAN DHCP or Static IP. This option will be unavailable if the WireGuard VPN protocol is enabled. Assign IP from – Select a LAN interface for IP assignment.

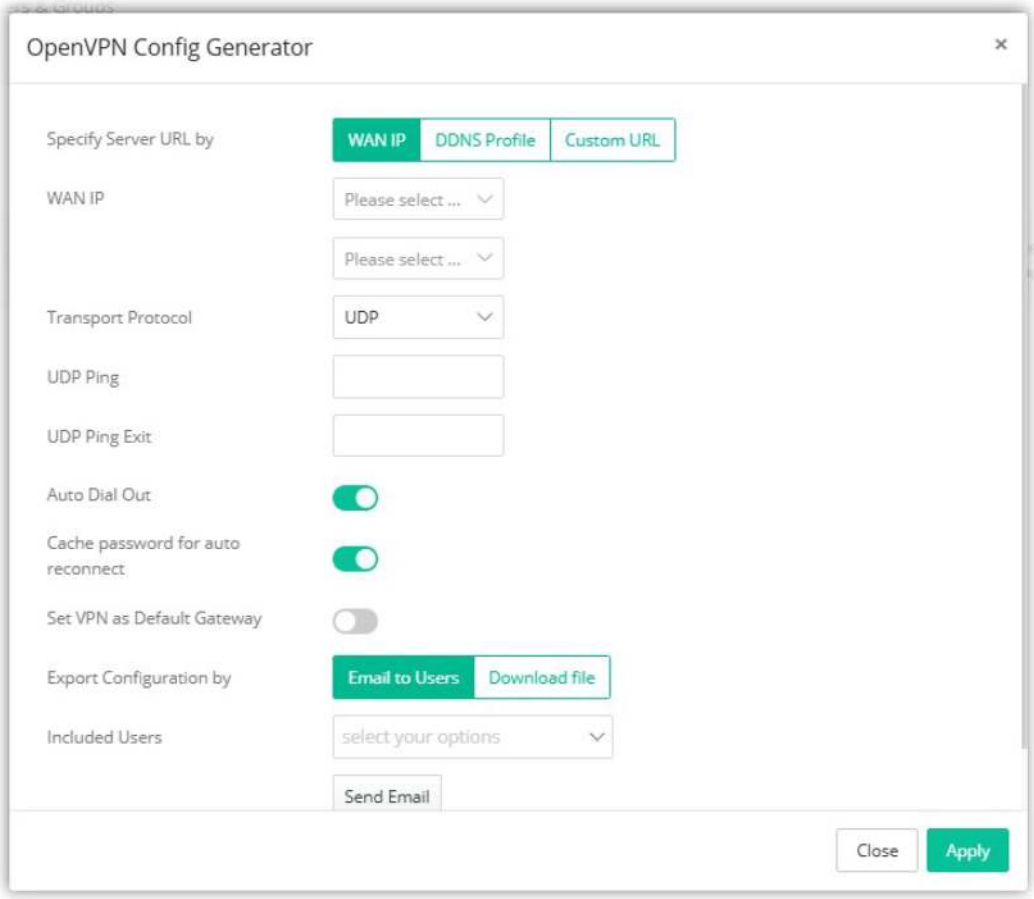
	• Static IP – Specify an IPv4 address. Assign DNS By – Choose LAN DHCP (the DNS IP will be assigned by Vigor router automatically) or Static DNS. If Static DNS is selected, configure Primary DNS and Secondary DNS. • Primary DNS – Enter the IPv4 address for Primary DNS server. • Secondary DNS – Enter another IPv4 address for DNS server if required. If Static IP is selected, • Static IP – Specify an IPv4 address.
Client Config Generator	This option will be unavailable if the WireGuard VPN protocol is enabled. VPN Server – Enter WAN IP or domain name of this router. Set VPN as Default Gateway – Switch the toggle to enable/disable the function. • Enable - The Vigor router will be treated as a "default" gateway for WireGuard VPN clients. The WireGuard VPN client will redirect all the traffic to the Vigor router via the WireGuard VPN tunnel. • Disable - Disable the function. • Replace the Default Route – Switch the toggle to enable/disable the feature. After clicking Apply, the client's default route will be replaced by the VPN route. config – The default text in this field is displayed automatically. It will be changed according to the QR-Code variation. Modify the text if required. Download Configuration - Click this button to download the config on this page as a file, which can be imported into a VPN client to establish WireGuard VPN connections.
General (if Router Management is selected as the Usage)	
Role	It is available if "Router Management" is selected as the usage. • Administrator • Guest • Users
Status	Active – Enable the general settings in this page. Inactive – Disable the general settings in this page.
Allow Login from WAN	It is available if "Router Management" is selected as the usage. If enabled, the user can login from WAN by using this user account.
User Information	Enable Email – Switch the toggle to enable or disable the email setting. • Email – Enter the email address for receiving the MFA PIN code. • Send Email Notification to the newly created User – Send a notification email to this user account. Enable SMS – Switch the toggle to enable or disable the SMS setting. • SMS - Enter the destination SMS number for receiving the MFA PIN code.

MFA & Port Knocking	Multi-factor authentication (MFA) can offer a more secure network connection. Enable MFA – Switch the toggle to enable/disable the MFA function. • Allowed MFA Method - Select to require TOTP, SMS or email authentication when logging in from the WAN. TOTP –For the Time-based One-time Password (TOTP) mechanism, please make sure the time zone of your router is correct. Then, install Google Authenticator APP on your cell phone. Open the APP to scan the QR code on this page. A one-time password will be shown on your phone. Select TOTP and click Apply. A pop-up dialog will appear as follows:  In the filed of Validation Code, enter the one-time password and click Verify. Now, the configuration is finished. You will be asked to enter the 2FA code on the after passing the username and password authentication. SMS/Email –The password will be sent via SMS or email as selected in the User Information above. • Enforce Port Knocking – Switch the toggle to enable/disable the Port Knocking function. 1st Knock Port - Enter a value (3001~59999). Click the (!) mark to have more information. TOTP Secret – Display the secret used for TOTP.
Account Info	Displays general information (created time, last login at and last login IP) for the user account.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

To add a new OpenVPN profile, click OpenVPN Config Generator.

On this page, you can create configuration required for a remote OpenVPN client to connect to the router and then download it directly or send it to the user via email.



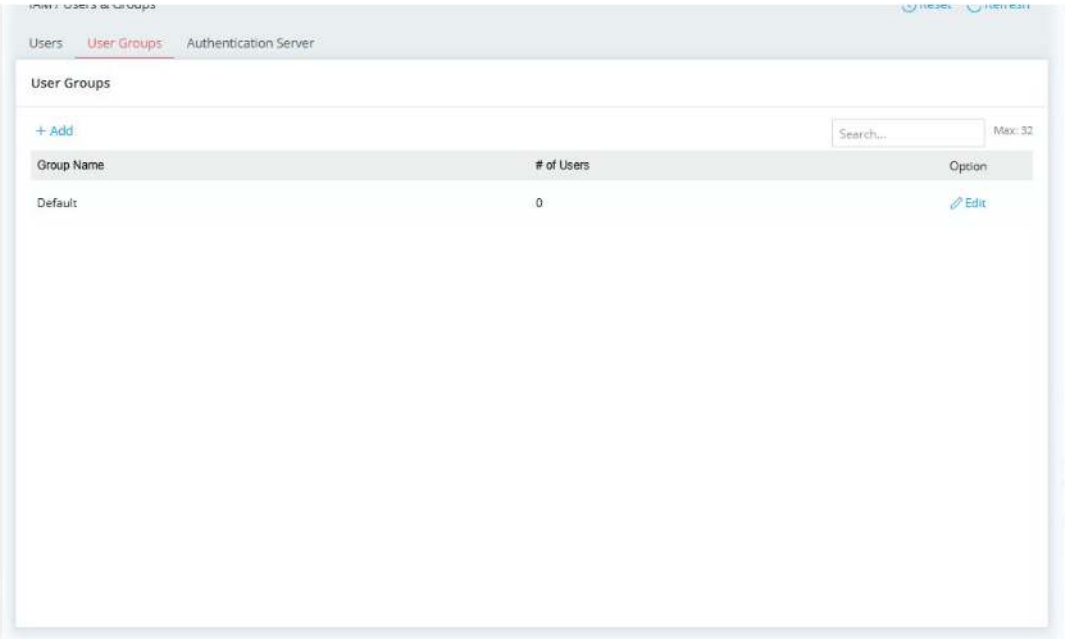
Available settings are explained as follows:

Item	Description
Specify Server URL by	The OpenVPN client will use the IP address or domain name to connect to the router. WAN IP – The OpenVPN configuration file will use the numeric IP address as the server address. • WAN IP – Select the WAN interface. DDNS Profile – The OpenVPN configuration file will use the domain name from the DDNS Profile. • DDNS Profile – Select a DDNS profile. Custom URL – The OpenVPN configuration file will use the user-defined server IP or domain name. • Custom URL – Specify a user-defined URL.
Transport Protocol	TCP/UDP - Select UDP or TCP for the protocol to be used by the OpenVPN client to connect to the router.
UDP Ping	Ping remote device over the UDP control channel, if no packets have been sent for the number of seconds configured here.
UDP Ping Exit	Let OpenVPN exit after the seconds set here if no reception of a ping or other packet from the remote device.
Auto Dial Out	Switch the toggle to enable/disable the function. Enable - The remote client can auto-dial to this Vigor router to build an OpenVPN tunnel. Disable - Disable the function.
Cache password for	Switch the toggle to enable/disable the function.

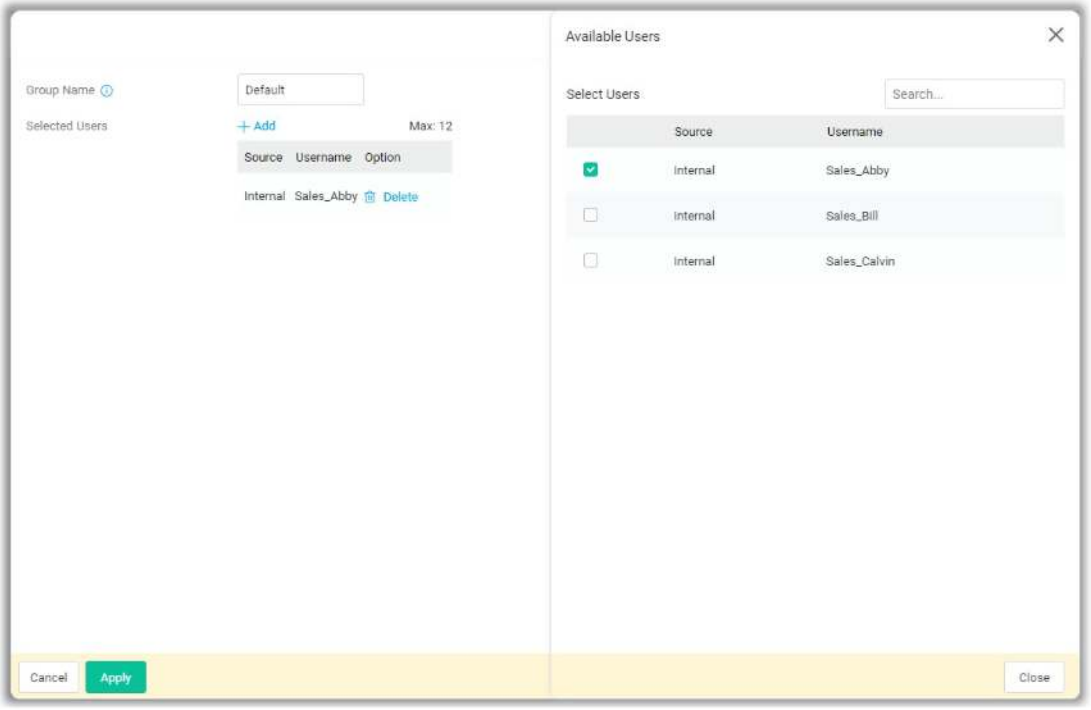
auto reconnect	Enable - OpenVPN will reconnect per hour. While reconnecting, the password is required. If the function is enabled, the password for OpenVPN connection will be kept and used by the Vigor system for reconnection every time. Disable - Disable the function.
Set VPN as Default Gateway	Switch the toggle to enable/disable the function. Enable - The Vigor router will be treated as a "default" gateway for OpenVPN clients. The OpenVPN client will redirect all the traffic to the Vigor router via the OpenVPN tunnel. Disable - Disable the function.
Export Configuration by	Email to Users – If selected, the Included Users field below will be displayed. The OpenVPN configuration file will be sent to users listed on Included Users. • Included Users – Select teleworker users that will receive the configuration from Vigor router. • Send Email – Click to email the settings on this page as a file, which can be imported into a VPN client to establish OpenVPN connections to teleworker users. Download zip file – The configuration file for OpenVPN will be stored on the database. If selected, the Download Configuration button below will be displayed. • Download Configuration - Click this button to download the settings on this page as a file, which can be imported into a VPN client to establish OpenVPN connections.
Included Users	Select teleworker users that will receive the configuration from Vigor router. Send Email – Click to email the settings on this page as a file, which can be imported into a VPN client to establish OpenVPN connections to teleworker users.
Close	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

II-3-1-2 User Groups

This page allows you to place multiple user profiles into groups.



To add a new user group profile, click **+Add**.



Available settings are explained as follows:

Item	Description
Group Name	Enter a name for identification.
Selected Users	**+Add** – Click to select user profiles to be grouped under the current group profile.
Available Users	It appears after clicking **+Add**.

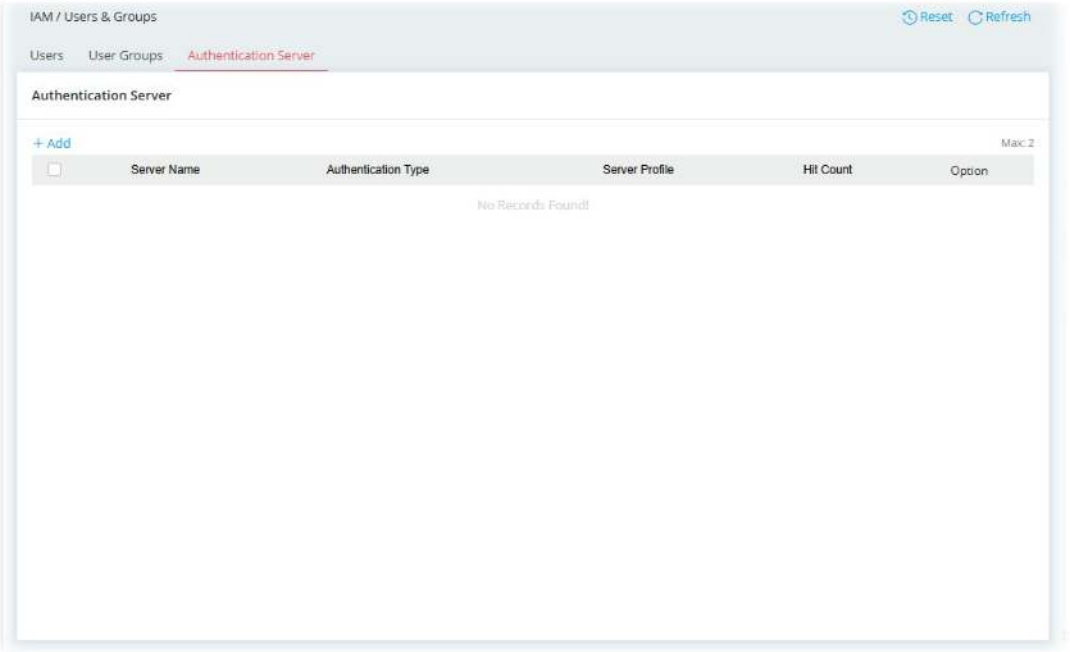
	Selected Users – Select the member from available user profiles.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.



II-3-1-3 Authentication Server

Vigor router can authenticate users using either a built-in (None) or external service (Radius or TACACS+) server.



To create a new authentication server profile, click **+Add**.



Available settings are explained as follows:

Item	Description
Server Name	Enter a name for identification.

Authentication Type	Select the authentication type (RADIUS or TACACS+).
Server Profile	If RADIUS is selected as Authentication Type, the available RADIUS server profiles (created on Configuration>>RADIUS/TACACS+) will be shown in this area. Select the one you need.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

After finishing this web page configuration, please click Apply to save the settings.

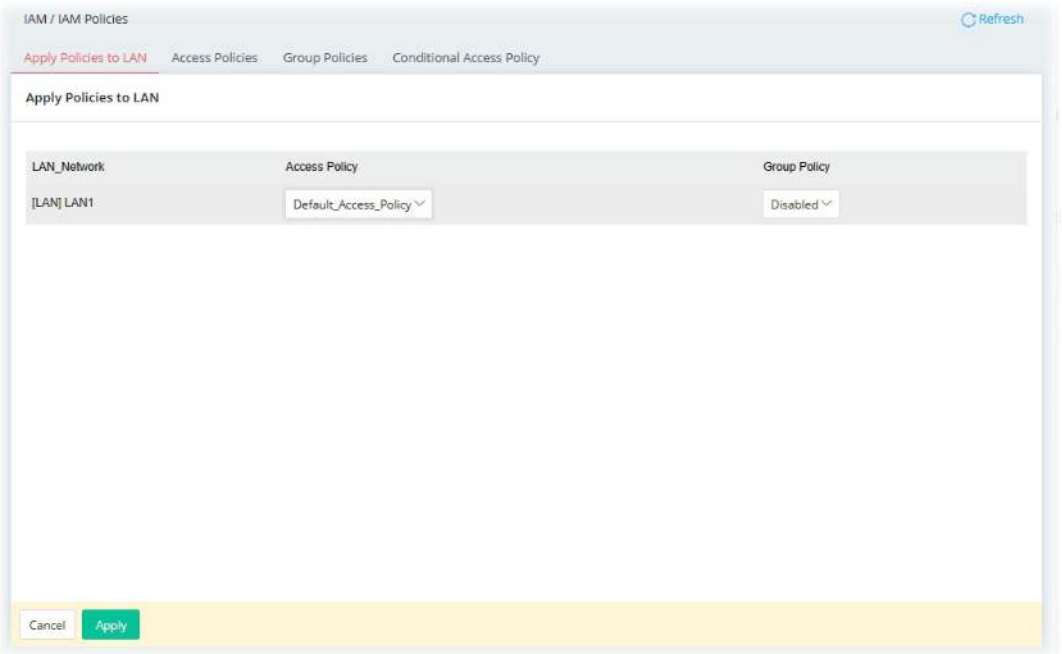


II-3-2 IAM Policies

IAM Policy contains access policy, group policy and conditional access policy.

II-3-2-1 Apply Policies to LAN

This page is used for selecting access policy and group policy which will be applied to the LAN profile.



Available settings are explained as follows:

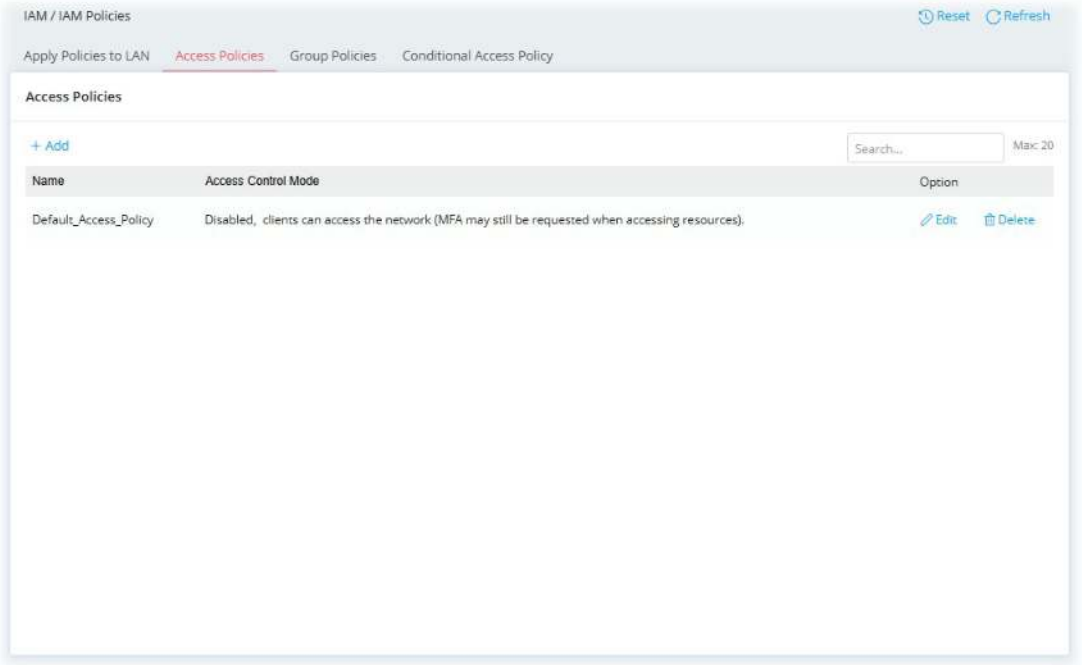
Item	Description
LAN Network	Display the interface that the IAM policy will apply to.
Access Policy	Select an access policy for this interface. Or select Disabled to ignore the setting.
Group Policy	Select a group policy for this interface. Or select Disabled to ignore the setting.
Cancel	Discard current settings.
Apply	Save the current settings.

After finishing this web page configuration, please click **Apply** to save the settings.

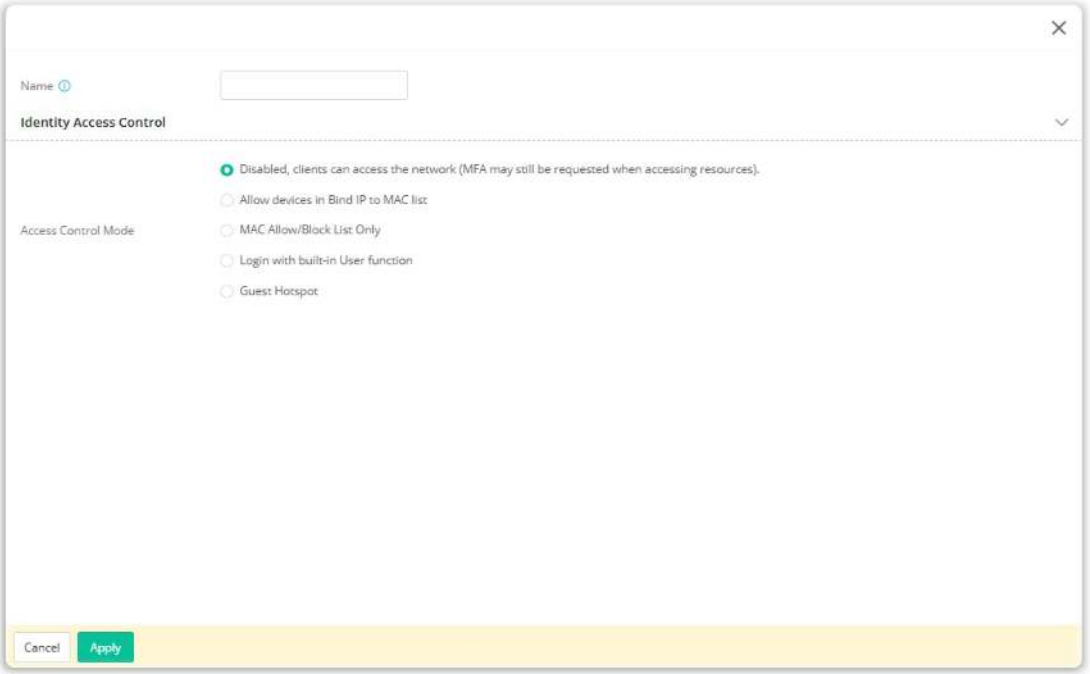
II-3-2-2 Access Policies

Access Policies can be applied to LAN interface to determine how the users/clients access the Internet via identification authentication.

This page is used for define different access policies for IAM application.



To add a new access policy profile, click **+Add**.

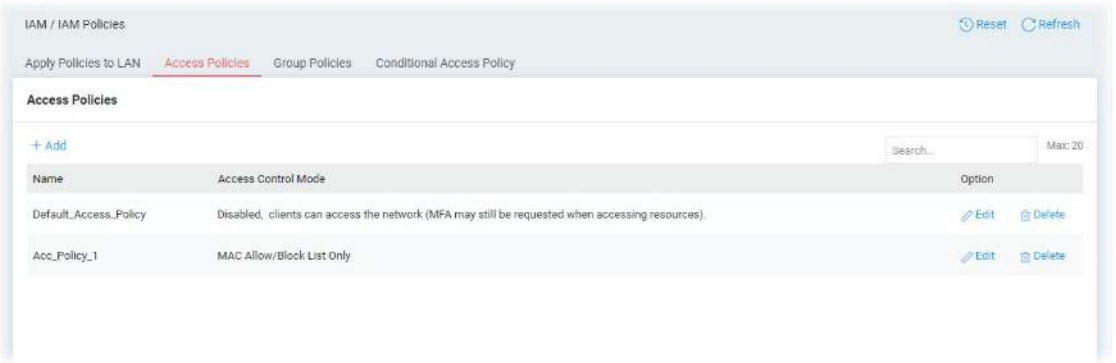


Available settings are explained as follows:

Item	Description
Name	Enter a name for identification.
Identity Access Control	
Access Control Mode	Disabled – All clients/user accounts can access the network. Allow devices in Bind IP to MAC list – The clients/user accounts listed in the Bind IP to MAC list can access the network. MAC Allow/Block List Only – Allow or deny the clients/user accounts access to the network by the MAC address filter profile. Login with built-in User function – The clients will be authenticated before accessing the network. Guest Hotspot - Allow or deny the clients/user accounts access to the network based on the hotspot profile selected.
If MAC Allow/Block List Only is selected as the Access Control Mode.	
MAC Address Filter	
Set up MAC Address Filter by	Selecting from Profile – Use pre-defined MAC Filtering profiles as the filtering basis. • MAC Filtering Profile - Select one of the MAC filtering profiles (Security>>MAC Filtering Profile) as the filtering basis. Manually – Define the MAC addresses and separate them as Allow List or Block List. • MAC Address Filter Mode – Select Allow List (allow the clients to access) or Block List (deny the clients access). Then, enter the MAC address of the clients separately on the MAC Address Filter Table. • MAC Address Filter Table – Click +Add to enter the MAC address of the client.
If Login with built-in User function is selected as the Access Control Mode	
Authentication Mode	Single-Factor - Only identification authentication is required. Multi-Factor - Multi-Factor authentication adds an extra layer of

	security, ensuring that only those users or devices within the Users or VLAN that apply specified Group Policy can access the specified resource.
MAC Address Filter	
Set up MAC Address Filter by	Selecting from Profile – Use pre-defined MAC Filtering profiles as the filtering basis. • MAC Filtering Profile - Select one of the MAC filtering profiles (Security>>MAC Filtering Profile) as the filtering basis. Manually – Define the MAC addresses and separate them as Allow List or Block List. • MAC Address Filter Mode – Select Allow List (allow the clients to access) or Block List (deny the clients access). Then, enter the MAC address of the clients separately on the MAC Address Filter Table. • MAC Address Filter Table – Click +Add to enter the MAC address of the client.
Allowed User List	
User	Configure the whitelist settings. Users are allowed to send and receive traffic that satisfies whitelist settings. All Users – All user accounts will be considered part of the whitelist. Selected Users – The whitelist will only consider the user accounts that have been selected. None - There will be no user account applied.
User Groups	Configure the whitelist settings. Groups are allowed to send and receive traffic that satisfies whitelist settings. All Groups – All user groups will be considered part of the whitelist. Selected Groups – The whitelist will only consider the user groups that have been selected. None – There will be no user group applied.
Login Session Lifetime	
Login Session Lifetime	Control the session time for users/clients. After the session's lifetime, the users/clients must log in to access the network, again. Specify the number of days, hours, and minutes.
If Guest Hotspot is selected as the Access Control Mode	
Hotspot Profile	Select one of the hotspot profiles.
Login Session Lifetime	
Login Session Lifetime	Control the session time for users/clients. After the session's lifetime, the users/clients must log in to access the network, again. Specify the number of days, hours, and minutes.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.

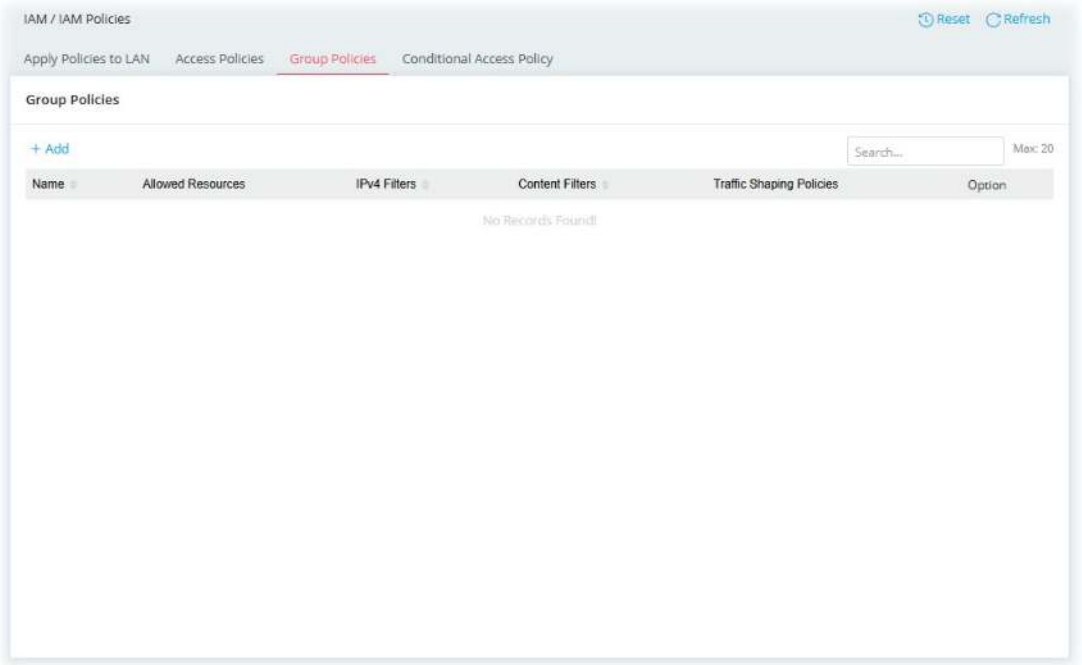
After finishing this web page configuration, please click Apply to save the settings.



II-3-2-3 Group Policies

The traditional firewall generally provides a blocking mechanism with IP-based rules to permit or block traffic on designated ports. To more securely manage access privilege, Group Policies provide a better way to help administrators decide permission for specific users, which define limitations and configuration based on role behavior to authorize corresponding restrictions, such as Time and Date Limit, Resources, Firewall Policies, and Traffic Shaping Policies.

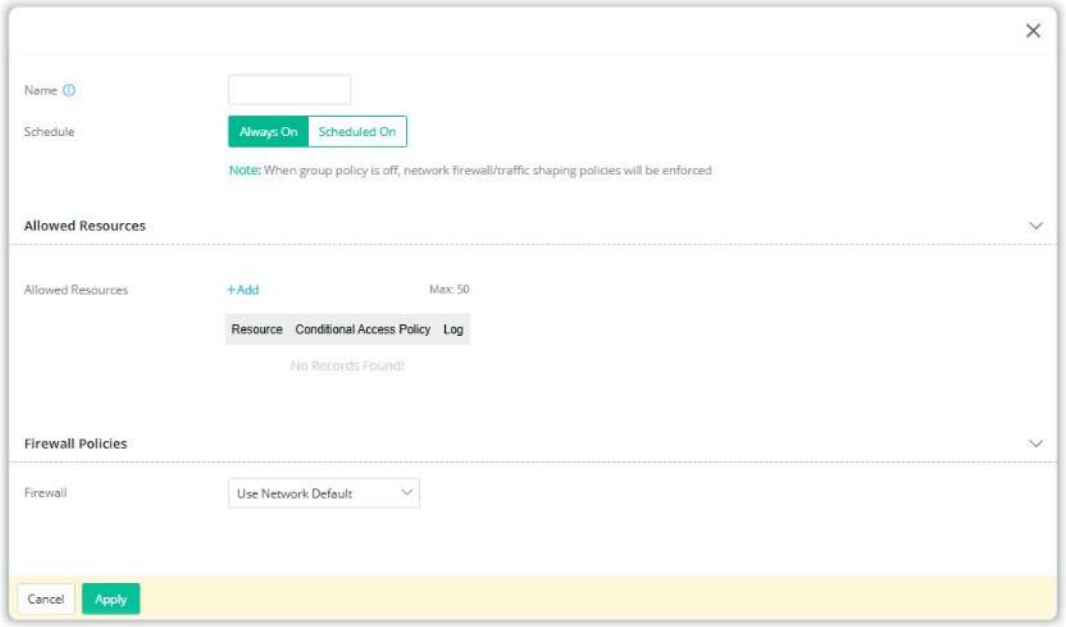
This page is used for configuring group policies for IAM application.



Note:

Once Group Policies are applied to user account/VLAN profile, even if the firewall filter setting has been setup, Group Policies will override rules set at the firewall filter.

To add a new group policy profile, click **+Add**.



Available settings are explained as follows:

Item	Description
Name	Enter a name for identification.
Schedule	Always On - The function of group policy is running all the time. Scheduled On - The function of group policy is activated based on the schedule profile.
Allowed Resources	
Allowed Resources	Select resources profile(s) and apply to this policy profile. +Add – Click to add a new resource profile. Resource – Use the drop-down menu to select IP or MAC resource profile. Conditional Access Policy – Use the drop-down menu to select access condition profile. Log – Select Pass or Block or Both. Corresponding records (related to passing or blocking packets) will be stored as a log. Option (Delete) – Click to remove the entry.
Firewall Policies	
Firewall	Use Network Default – Select this item to use the default group firewall filter settings. Customize Group firewall filters – Select this item to customize the group firewall filter settings. The firewall policy will be applied to allowed resources defined above.
If Customize Group firewall filters is selected as the Firewall	
Outbound IPv4 Filters	+Add – Click to add new IPv4 filter profiles (up to 10) for outgoing traffic. Name – Set a name that identifies the IP filter profile. The maximum length of the Profile Name is 15 characters. Destination IP Start – Enter an IP address as the starting IP address. Destination IP End – Enter an IP address as the ending IP address. If only one static IP address will be filtered by this profile, enter the same IP address as the value in Destination IP Start.

	Protocol – Specify the protocol(s) which this filter rule will apply to. Dest Port Start – Specify the target port range (starting point) if the protocol is TCP or UDP. Dest Port End – Specify the target port range (ending point) if the protocol is TCP or UDP. Action –Select Pass to allow access to the IP address; select Block to disallow access to the IP address. Option(Delete) - Click to remove the selected entry.
Content Filters	The system will check the outgoing sessions additionally with the selected content filters profile(s). +Add – Click to add a new content filter profile (up to 10). Profile Name – Set a name that identifies the content filter profile. The maximum length of the Profile Name is 15 characters. Scheduled On - The filter profile will be valid based on the time schedule specified here. Destination – Select specific WCF and/or APPE and/or UCF (keyword object) profile to be included in the filter. Action – Select Pass to allow access to the Destination; select Block to disallow access to the Destination. Enable Keyword Exception – Switch the toggle to enable/disable the function. Keyword Exceptions - Display selected keyword objects. The system will check the sessions additionally with the selected keyword profile(s). If the session meets the keyword filter profile, the system will perform the action reversely.
IP Filters Default Action	Any packet that does not comply with the rules set in Outbound IPv4 Filters and Content Filters will be processed according to the default action. • Pass - Allow access to the IP address. • Block - Disallow access to the IP address.
Enable Content Filter Default Rule	If enabled, Content Filters Default Action - Any session that does not comply with the above firewall filters rules but matches the content destination rule will be processed according to the default action. • Pass - Allow the session pass which is matched Content Destination rule. The outgoing traffic that matches the following Content Destination rule will be passed. Otherwise, it will be blocked. • Block - Disallow the session pass which is matched Content Destination rule. The outgoing traffic that matches the following Content Destination rule will be blocked. Otherwise, it will be allowed to pass through. Content Destination – Select the WCF and/or APPE and/or UCF (keyword object) profile to be included in the filter. It is treated as an additional content filter rule to determine whether the packets/sessions will be passed or blocked.
Enable Syslog	The filtering result can be recorded according to the setting selected for Syslog.
Cancel	Discard current settings and return to the previous page.
Apply	Save the current settings and exit the page.