KENSTEL

KAP-310
User Manual

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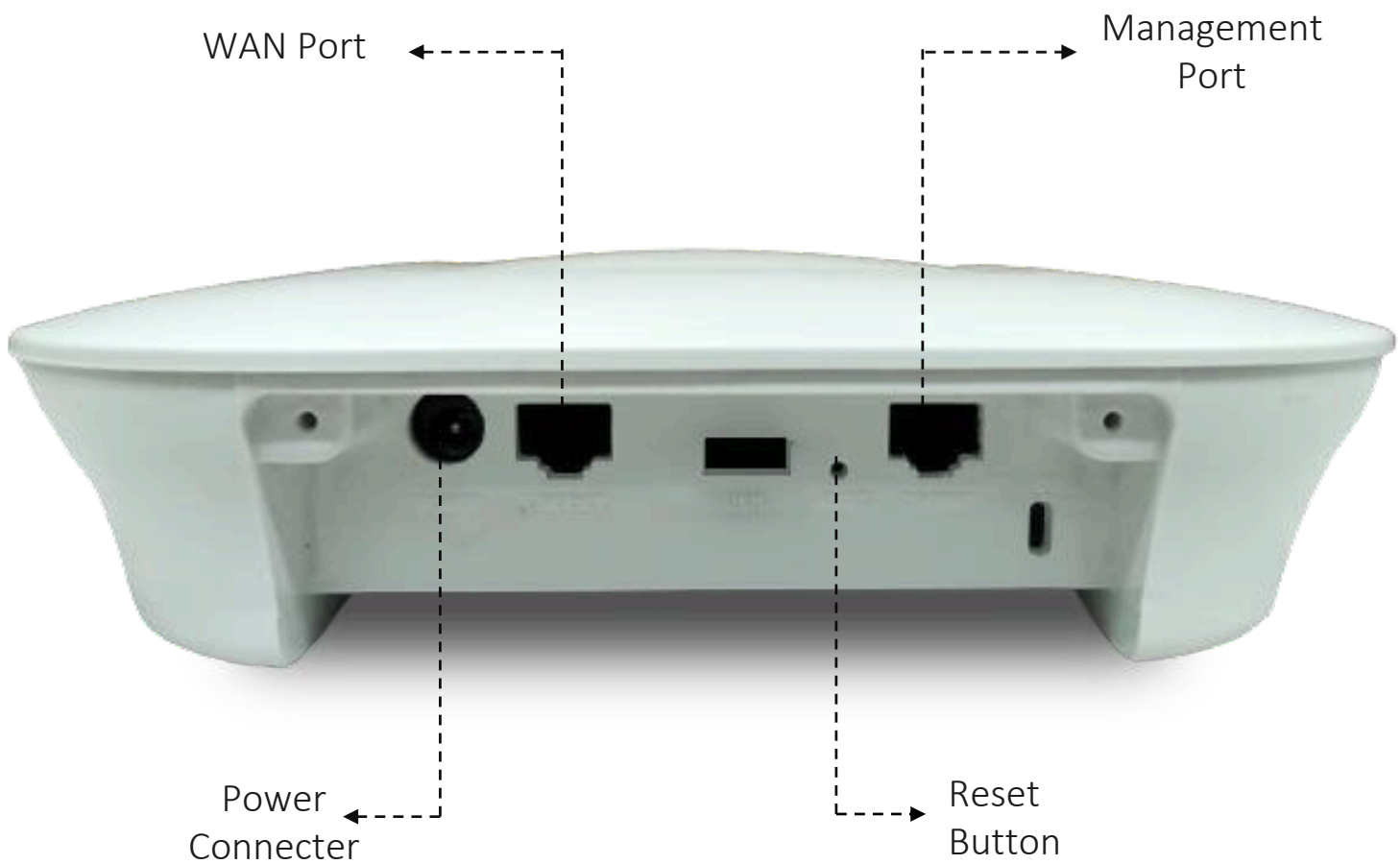
Note: In this document you will find **‘Rule Type’** where it is mentioned as **By group** or **By Name**. For that, refer to the below lines.

If you select By group then the features will apply to all the AP devices within the selected AP group. And if you select By name then the features will apply to the selected AP device only. Here, you can choose multiple groups or devices. By default, the most recently created rule will apply to a new device. And if you delete the newly created rule type then it will switch to the earlier added rule type whether it is By Group or By Name.

Appearance



Wan Port: Through WAN Port you can connect your AP to the internet.

Management Port: Connect your device to your system using the management port, and ensure that you input a static IP. The default IP for this connection is 40.0.0.1.

Power Connector: Power connector is the port where you plug in the power adapter to supply electrical power to the device.

Reset Button: Push for 10 Seconds and release for reset. You can do the same at least 2 minutes after KAP310 Power-up.

To open UI, use https://40.0.0.1 with Username: **user** & Password: **password**

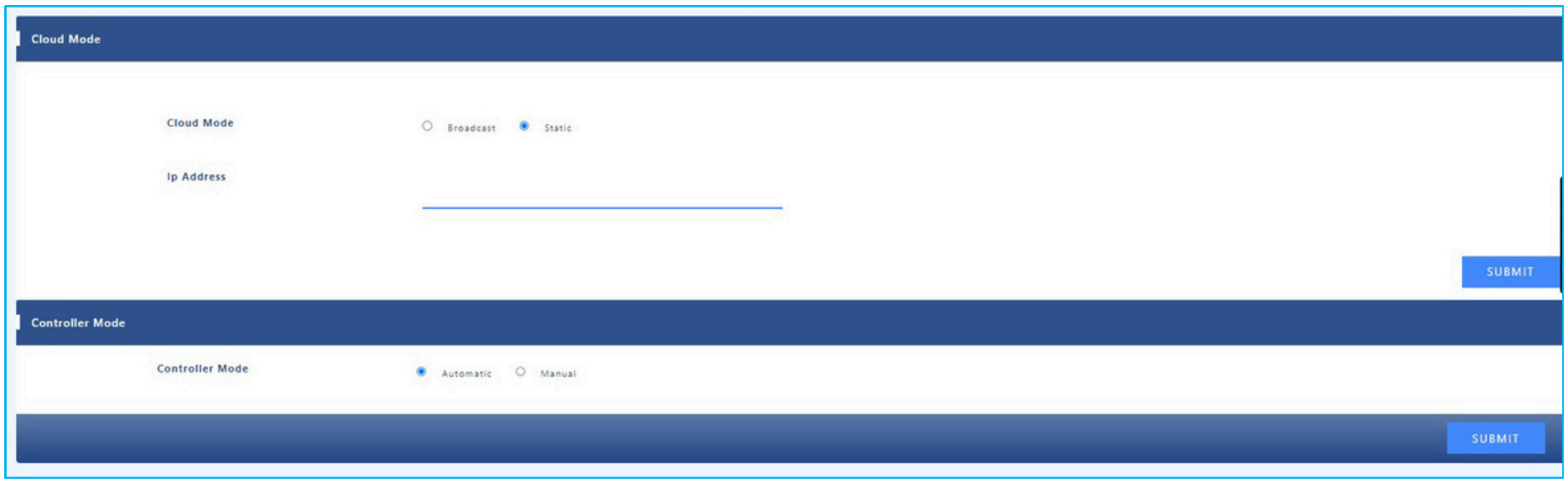

Step 3
Device's Local UI
Pending Approvals in Cloud
https://40.0.0.1
Step 2
Step 1

Connect your Device via MAN Port → Then open with the IP, https://40.0.0.1 → Signin with the default username and password.

And then go to Management → Controller Setting

Cloud Mode: There are two cloud modes one is Broadcast and another one is Static. If you enable Static mode then input the ip address.

Controller Mode: There are two controller modes one is Automatic and another one is Manual. In Automatic mode device will get the IP automatically from cloud while in manual you have to input the IP manually.



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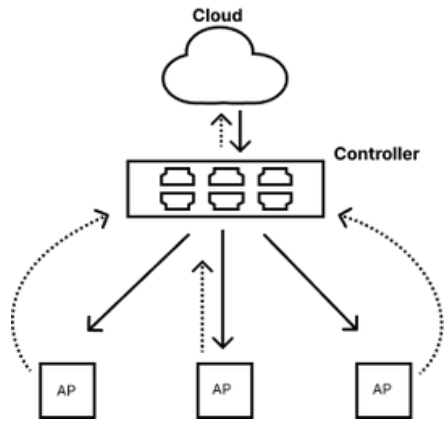
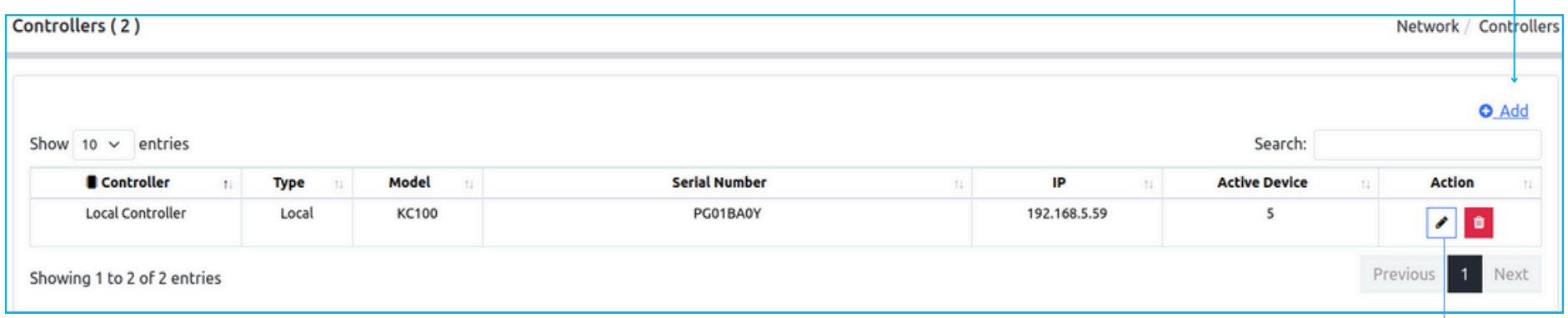
Controller



Controller acts like a bridge to connect to all the Access Points, CPEs and Routers with Cloud. Controller takes incoming messages from cloud and sends them to all the AP's, CPEs and Routers. It also collects all the information from AP's, CPEs and Routers and sends them back to the cloud.

To reach this Page go to Network → Controllers

Here you can add Controllers to the Cloud by clicking on the Add New Button.



(You able to see this page when it is in Basic mode.)

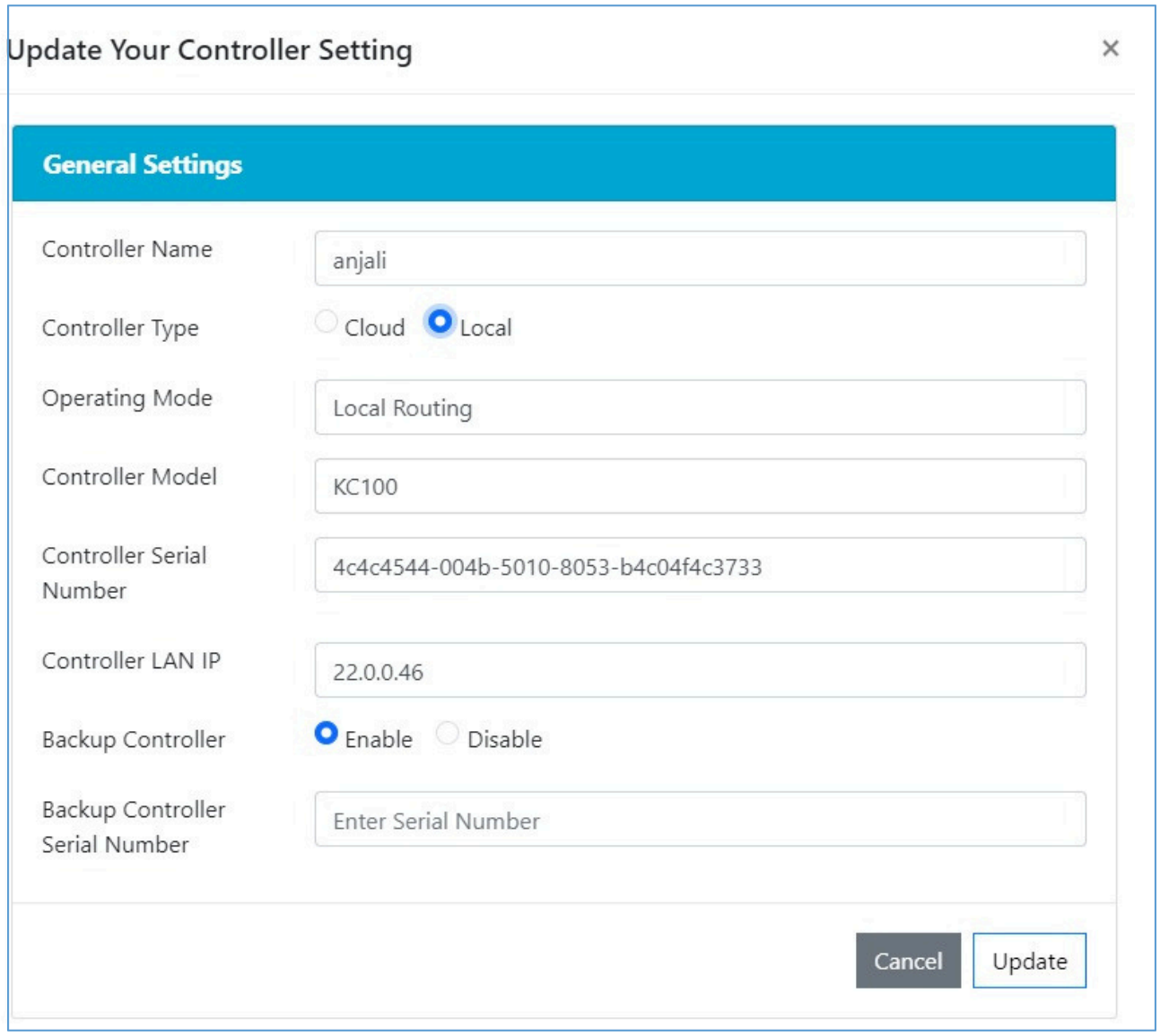
Basic Mode: Basic mode refers to a simplifiied or standard level of control and management interface. This mode is designed for straightforward management tasks and is generally user friendly, offering essential features and functionalities without extensive customisation options.

Click here to open the Edit Controller Page

Controller

Controller can operate on Local Routing, Centralized forwarding and Bridging.
Local routing: In the case of Local routing, Captive Portal, Network rate limit and user by the rate limit are all features operated on Access Point itself.
Centralized forwarding: But, in the case of Centralized forwarding, all the above features are implemented on controller.

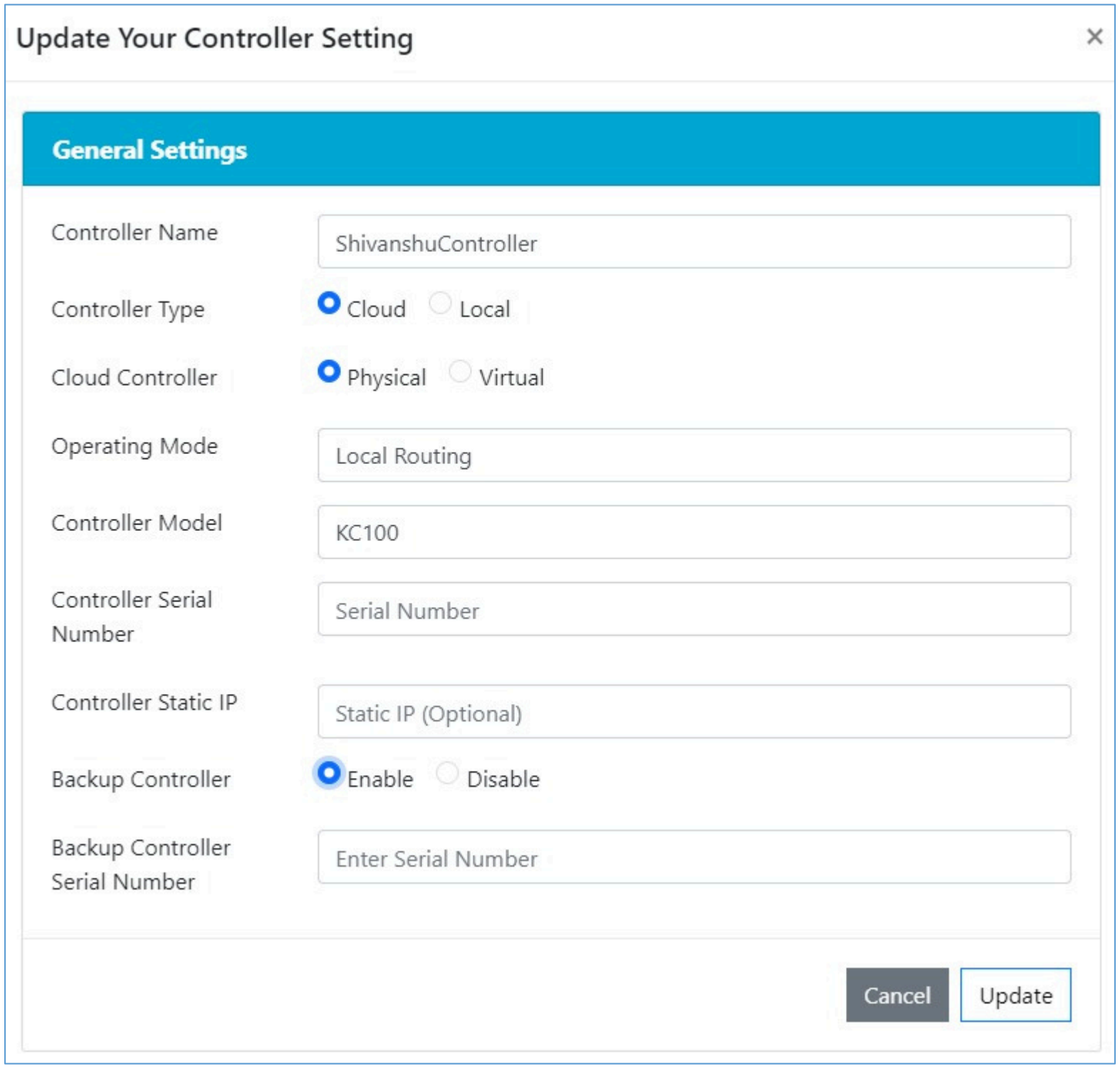
Edit Controller page when controller type is in Local.



Here you can edit your controller Settings.

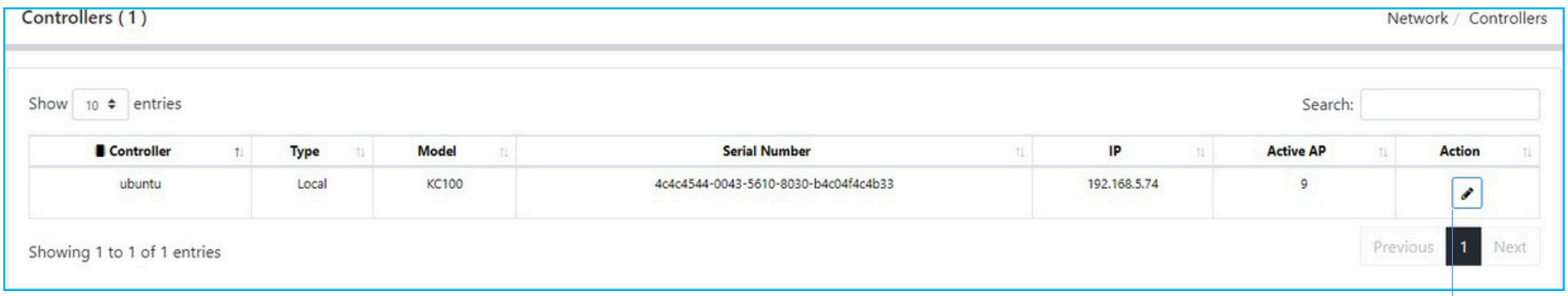
Controller

Edit Controller page controller type is in Cloud.



Here you can edit your controller Settings.

Controller



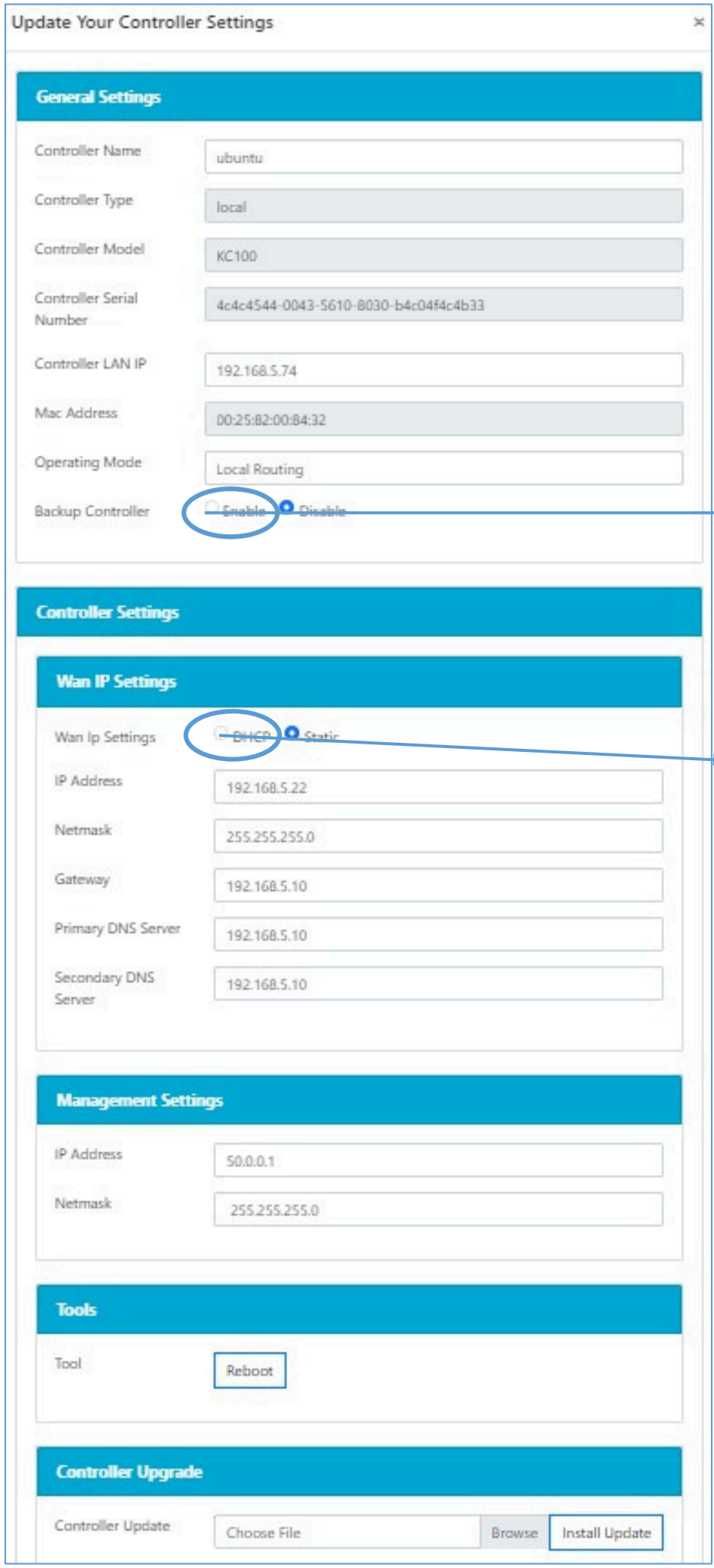
(You able to see this page when it is in Mixed mode.)

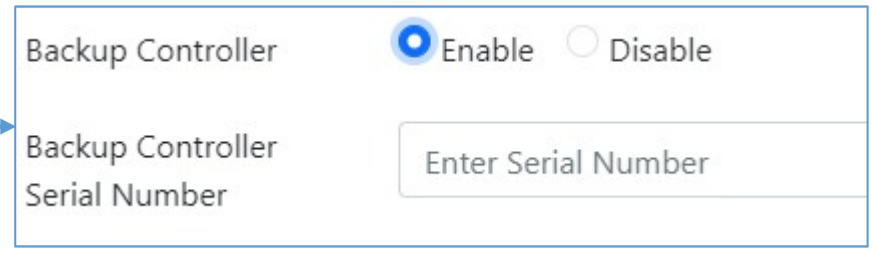
Mixed Mode: Mixed mode is a more complex approach that combines both basic and advanced features in the control interface. This mode is designed for users or organizations with diverse needs and provides access to a wide range of capabilities, from basic provisioning and monitoring to more complex features such as advanced automation, policy enforcement, and hybrid cloud management.

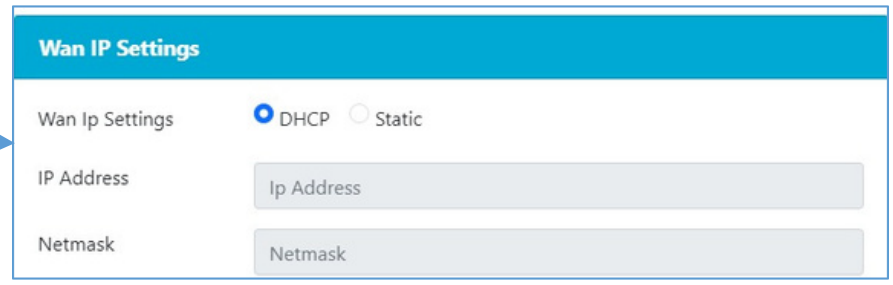
Click here to open the edit controller page.

Controller

Edit Controller page.

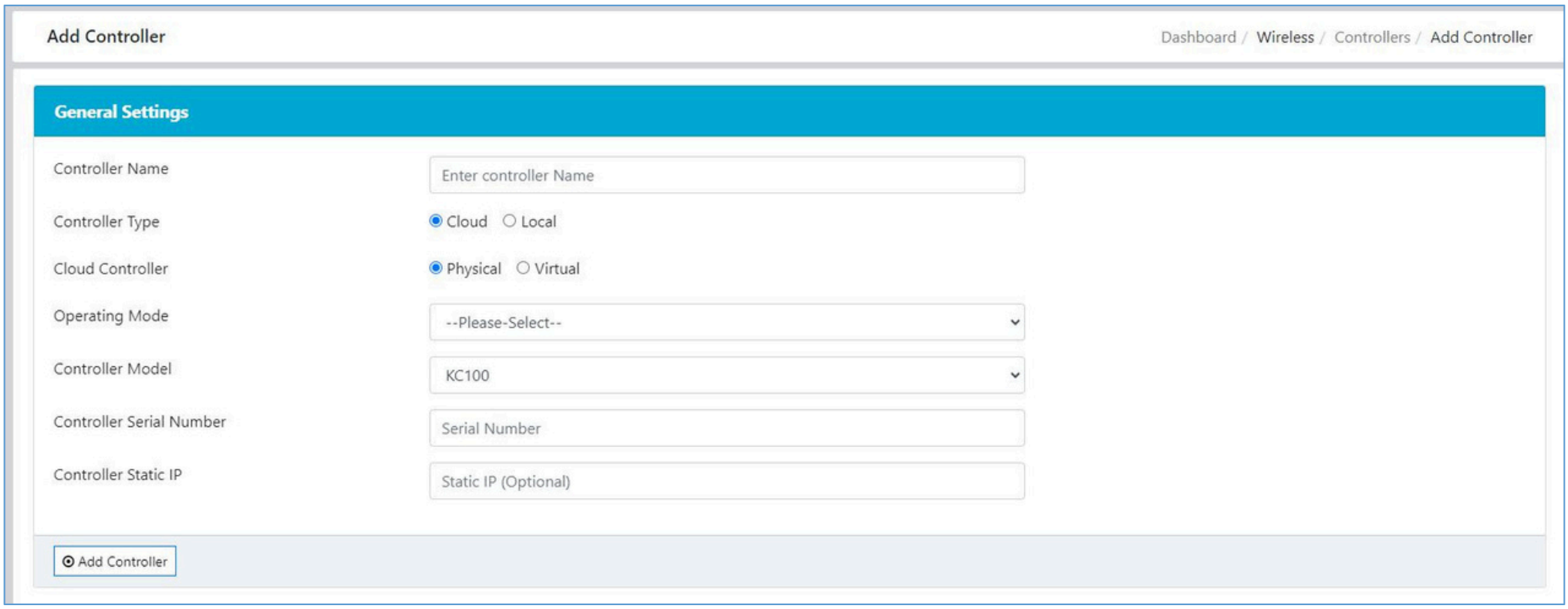






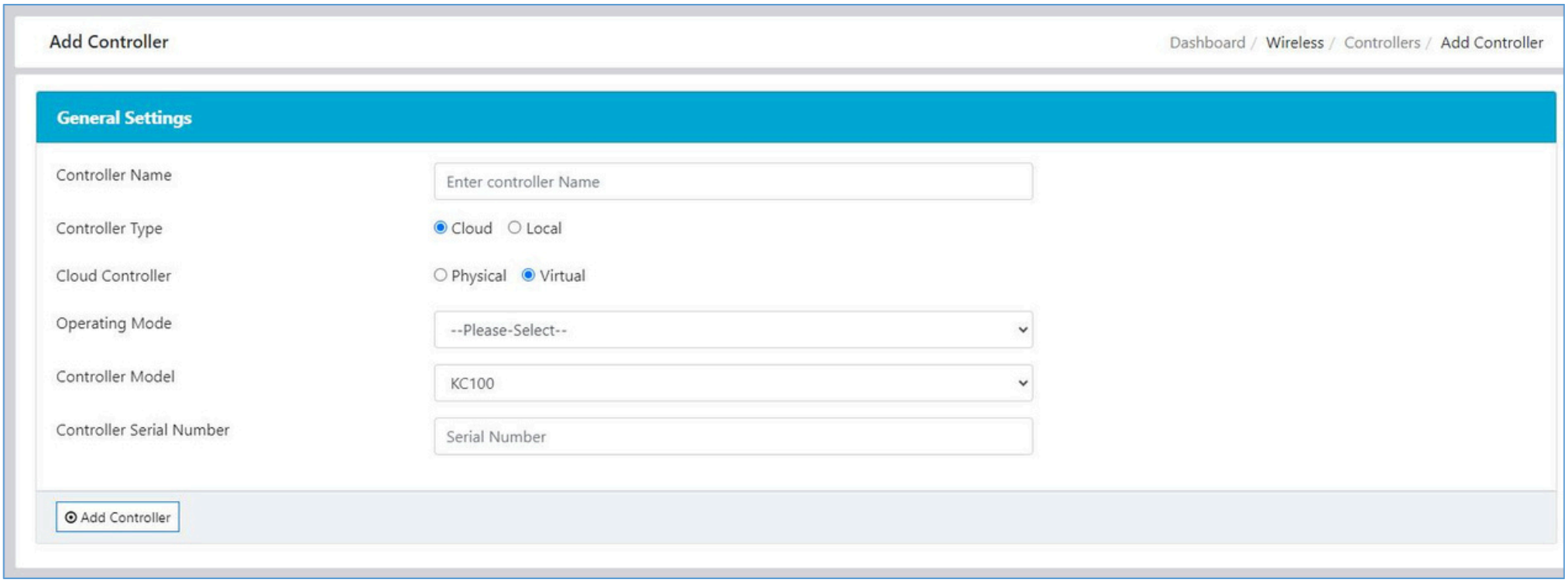
Controller

There can be two types of controller: 1. Cloud
2. Local



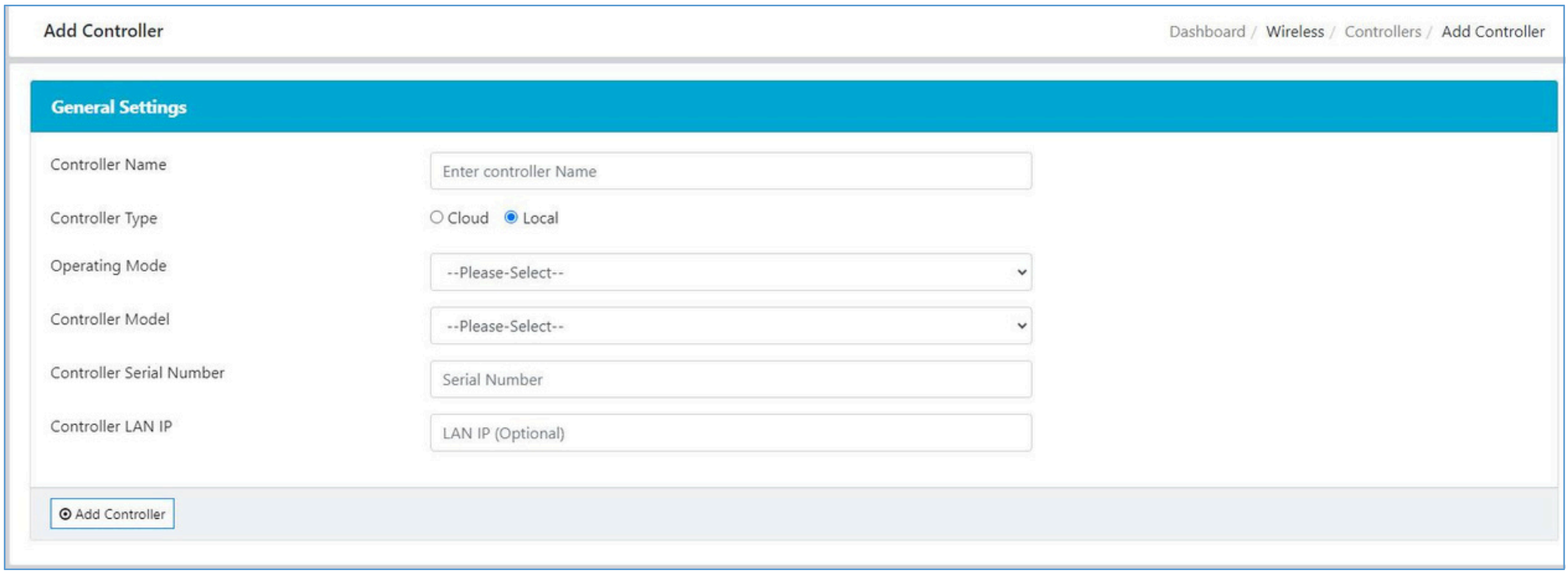
Cloud:- In the case of Cloud controller, there can be two cases, first case is the one in which controller is physical device, here this controller can have a static IP and this IP can be binded to multiple user and can be binded with multiple locations.

Controller



Virtual, here this controller can be binded to multiple users and it is a EC2 instance.

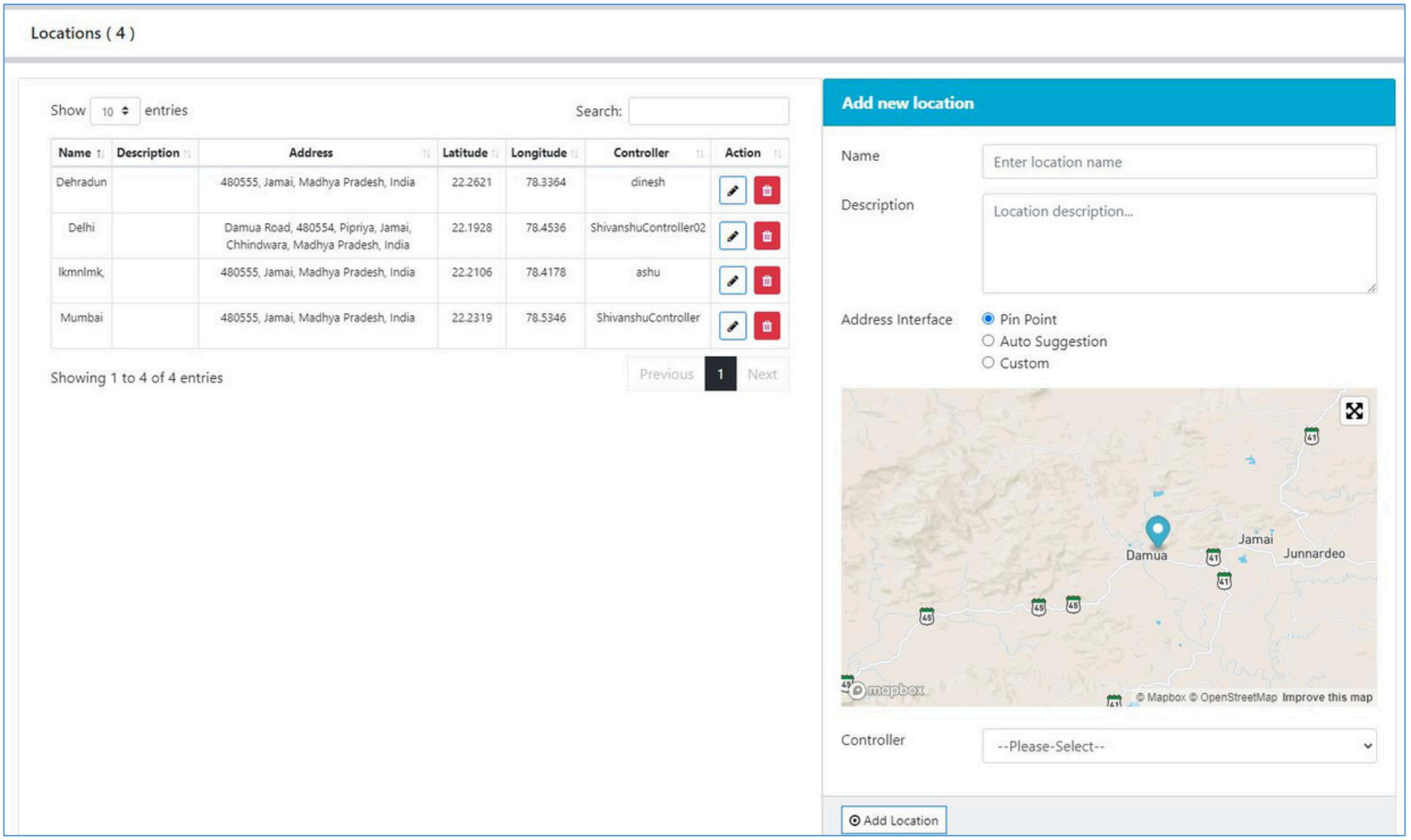
Controller



Local :- In the case of local controller, one user can access that controller and also local controller can be binded to only one location.

Location

Location :- Add the location where your AP's are present. While adding location specify which controller has to be selected.



On this page, on the left side, you are able to see the locations of the already added controllers. If you want to edit a location, click on the edit icon.

On the right side, you can add new locations. By default, the Address Interface is set to 'Pin Point,' requiring you to manually pin the address. You have the option to switch the Address Interface to 'Auto Suggestion' or 'Custom' based on your preference. With 'Auto Suggestion,' you only need to search for the address, and it will be automatically pinned. In the 'Custom' mode, you need to fill in all the required address fields."

Devices

Access Points typically connect to the cloud-based controller platform to manage and control the wireless network infrastructure.

Here's how APs work within a cloud controller setup:

1. **Deployment and Management:** APs connect to the cloud controller, which allows for centralized management, configuration, and monitoring of the entire wireless network.

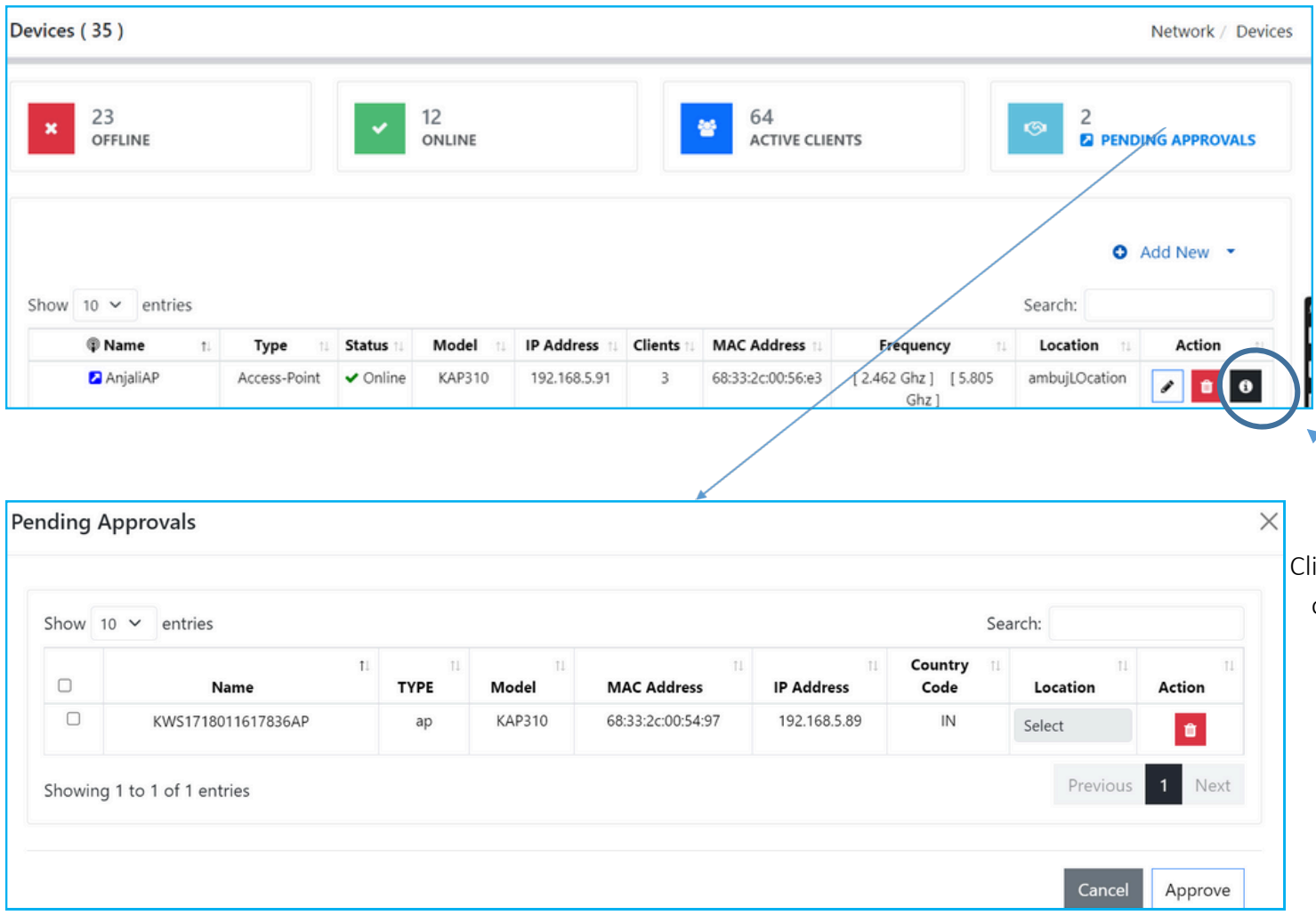
2. Configuration : Through the cloud controller, administrators can configure settings for the Access Points, such as SSID (network name), security protocols, quality of service, and more.

3. Firmware and Software Updates : The cloud controller can facilitate the distribution of firmware and software updates to all the Access Points. This ensures that all APs are running the latest versions and security patches.

4. Load Balancing and Roaming: Depending on the configuration and capabilities, the cloud controller can help manage client distribution across APs to balance the load and maintain optimal performance.

There are two ways to Add AP

To reach this Page go to Network → Devices → Pending Approvals

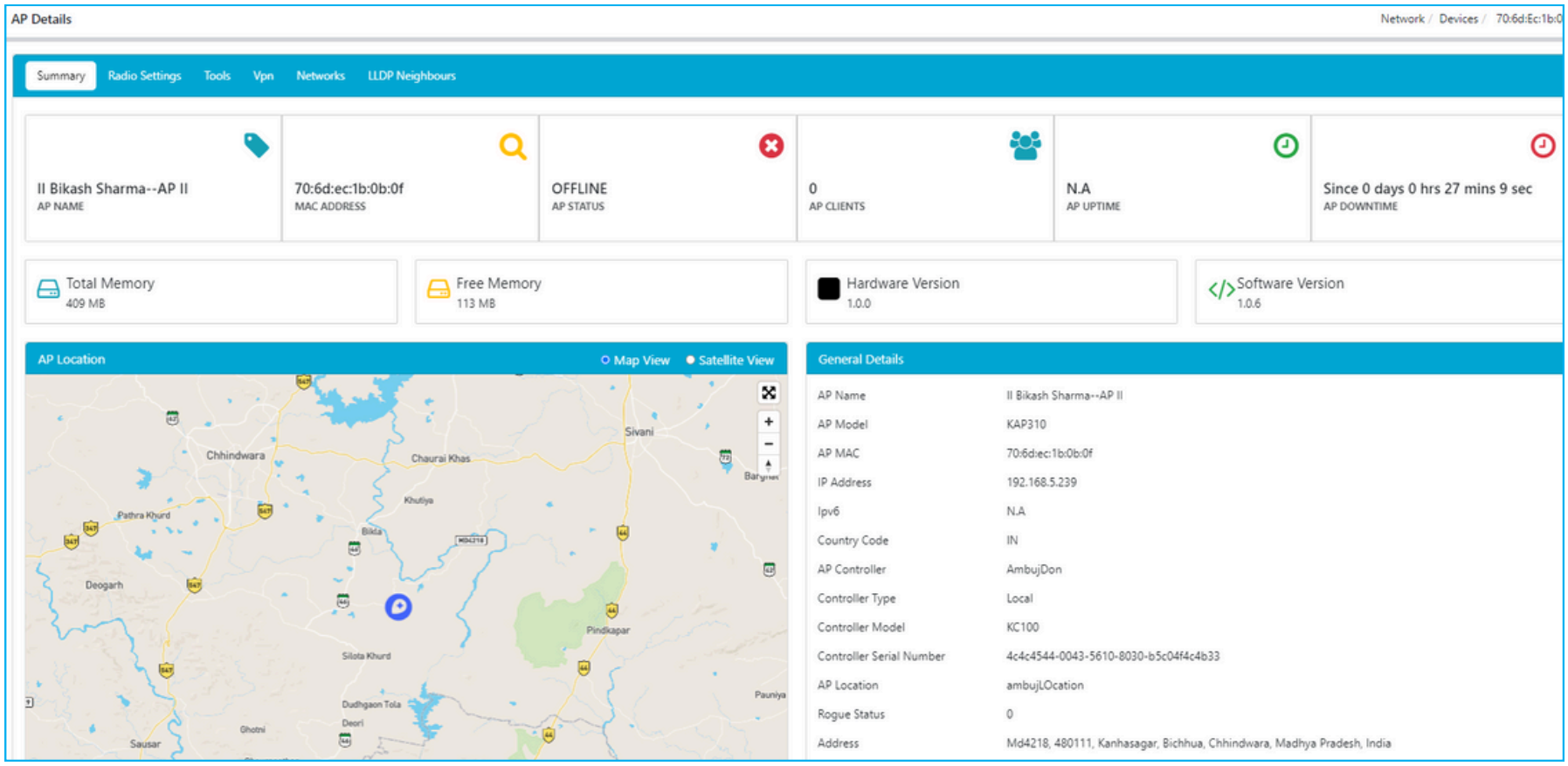


Click here to check the overview of the AP.

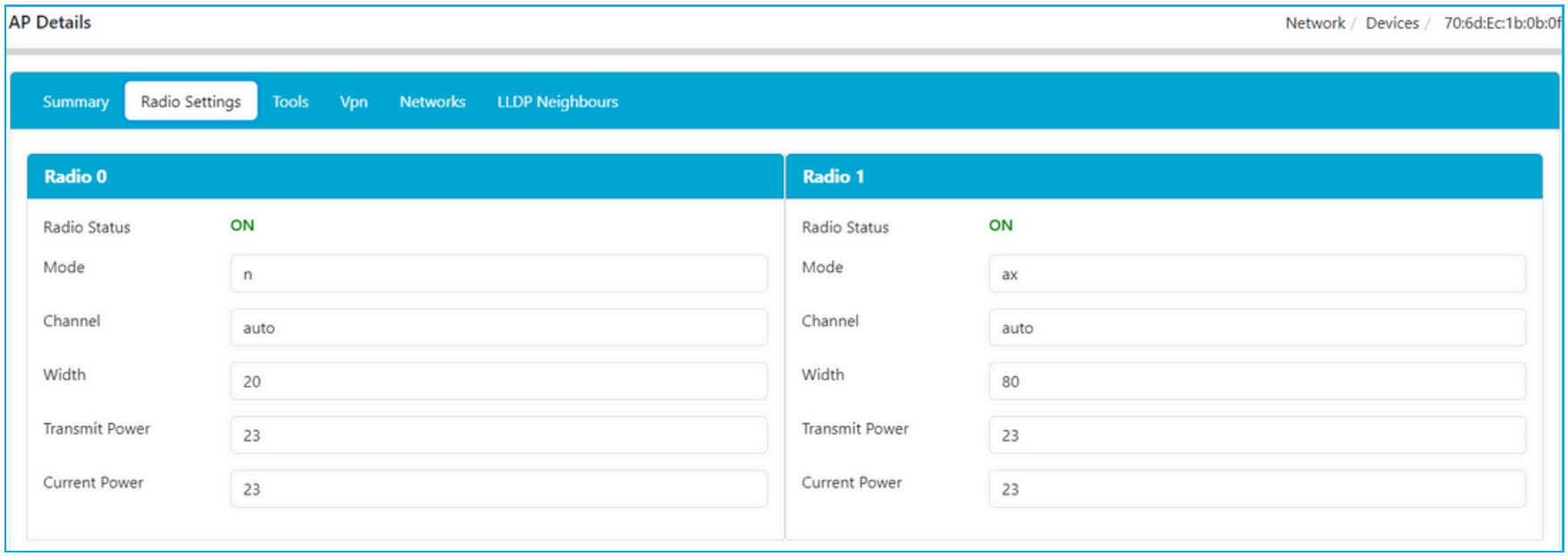
AP will be visible when it is added to the Cloud. To add the AP to the Access Point, select the AP and Location then Click on Approve.

Devices

Here you can get the overview of the AP.

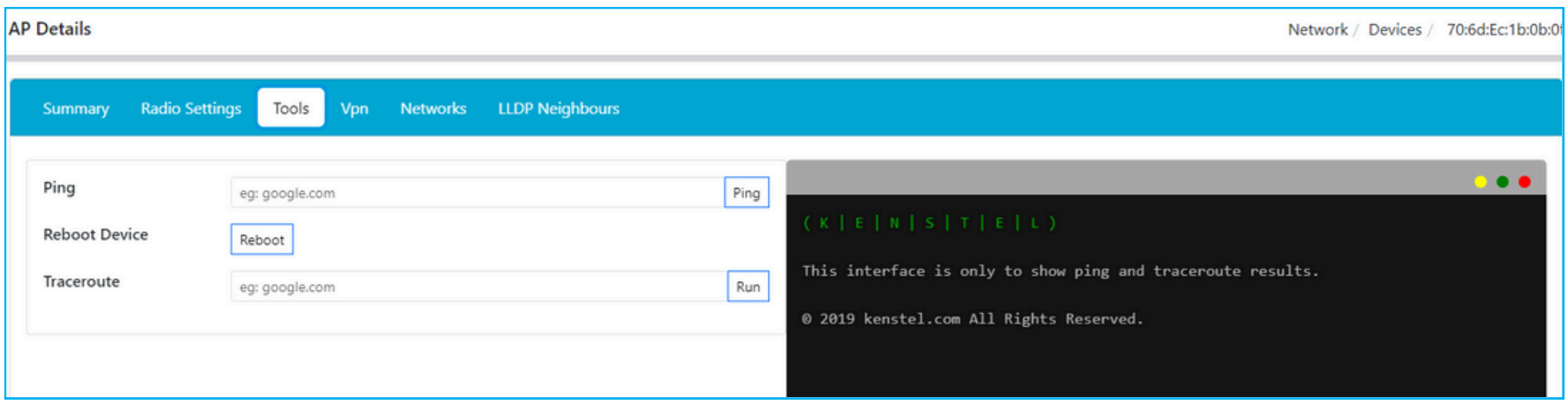


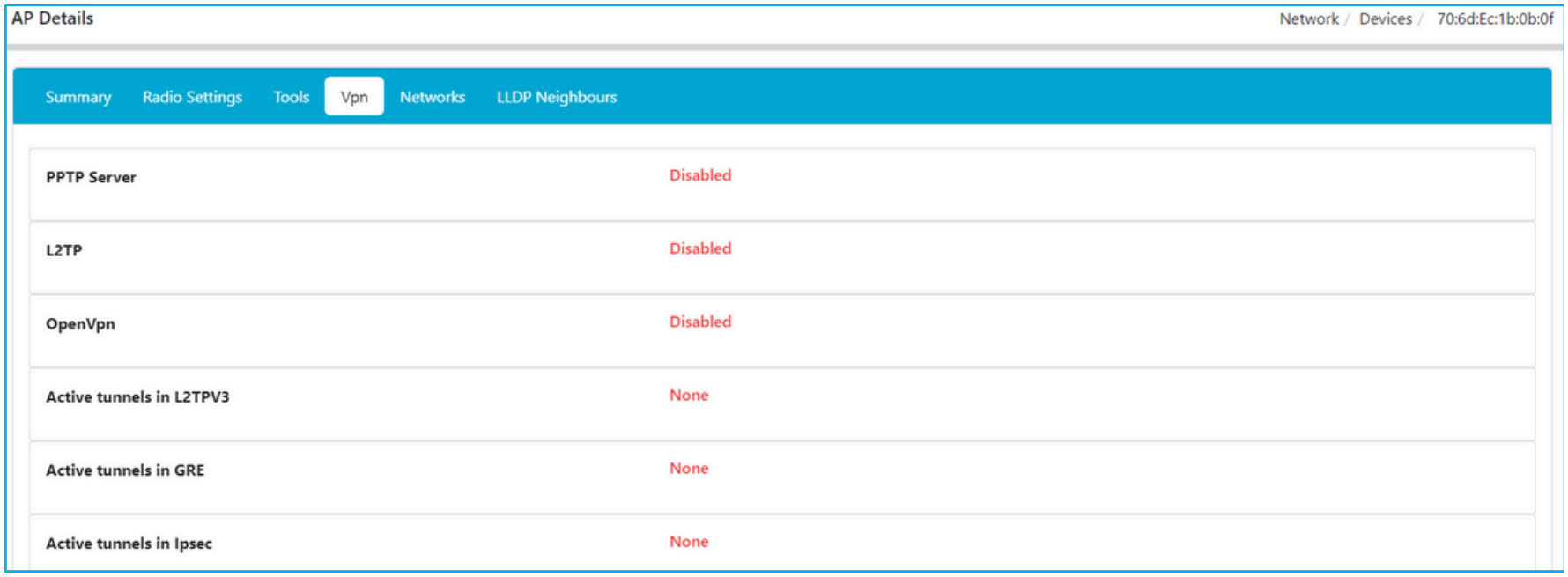
You will find an overview of the Radio Status here.



Device

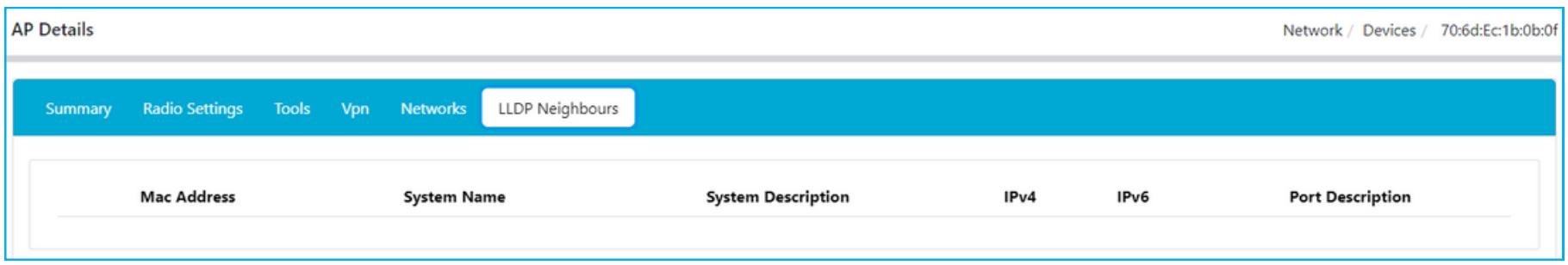
You can Ping and Reboot here.





Device

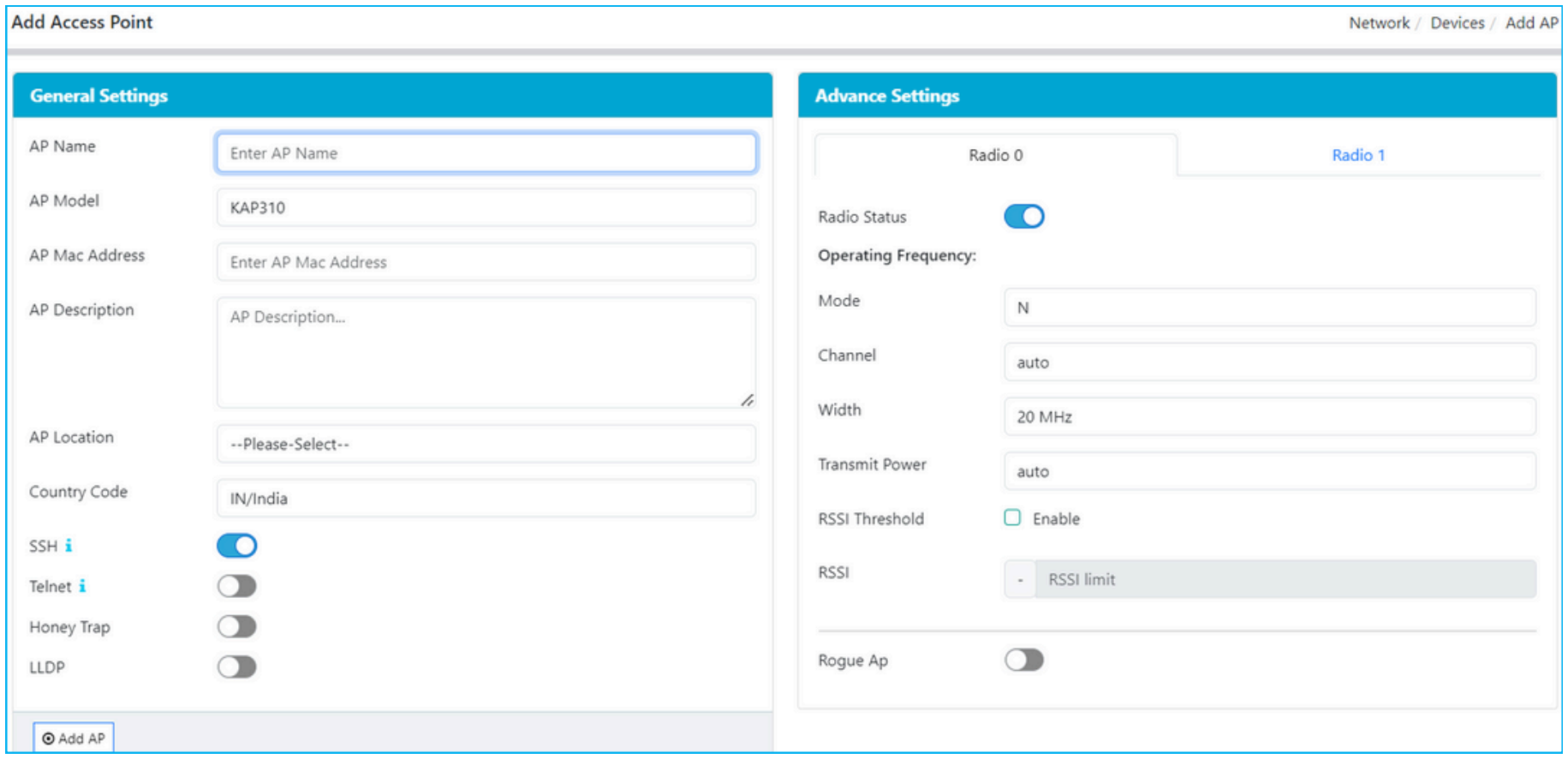

AP Details
Network / Devices / 70:6d:Ec:1b:0b:0f
Summary
Radio Settings
Tools
Vpn
Networks
LLDP Neighbours
Interfaces
Status
IPV4
IPV6 Status
IPV6
Interface 1
20.0.0.1
Enable
2001:db8:3333:4444:5555:6666:7777:8888/64
Interface 2
21.0.0.1
Disabled
Interface 3
22.0.0.1
Disabled
Interface 4
23.0.0.1
Disabled
Interface 5


AP Details
Network / Devices / 70:6d:Ec:1b:0b:0f
Summary
Radio Settings
Tools
Vpn
Networks
LLDP Neighbours
Mac Address
System Name
System Description
IPv4
IPv6
Port Description

Device

Another way to Add AP

To reach this Page go to Network → Devices → Add New → Access Point



General Settings

1. **AP Name:** You can add any name.
2. **AP Model:** You can choose AP model from dropdown button.
3. **AP Mac Address:** You find AP Mac on the back of your Device.
4. **AP Description:** Description is optional.
5. .**AP Location :** Select the location from the dropdown button.
6. **Country Code:** Select the Country from the dropdown button.
7. **SSH:** SSH, which stands for Secure Shell, is a cryptographic network protocol used for secure communication over an unsecured network. It is commonly used for remote administration of servers and secure file transfers. Enable the button if you want to activate SSH.

7. Telnet: Telnet is used on the internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection. Enable the button if you want activate Telnet.

8. **Honey Trap:** A honey trap is set up to identify and mitigate potential threats or attacks. . Enable the button if you want activate Honey Trap.

9. **LLDP:** LLDP plays a crucial role in facilitating the automatic discovery and mapping of network

topologies, making it easier to manage and troubleshoot network configurations, especially in diverse and multivendor environments. Enable the button if you want activate LLDP

Advanced Settings

1. **Radio0 and Radio1:** These are the network bands. 0 indicates 2.4GHz and 1 indicates 5GHz.

2. **Mode:** Different APs has its different Modes(N ,AC, AX and Legacy).

N Mode (802.11n): Offers improved speed and range over older standards. It operates in both 2.4 GHz and 5 GHz bands and uses multiple antennas (MIMO) for better data rates.
AC Mode (802.11ac): Operates exclusively in the 5 GHz band. It provides even higher speeds and performance than 802.11n, utilizing advanced MIMO technology and wider channel bandwidths.
AX Mode (802.11ax): Also known as Wi-Fi 6, this standard improves efficiency in crowded environments. It operates in both 2.4 GHz and 5 GHz bands, supporting higher data rates, increased device capacity, and better performance in congested areas.
Legacy Mode: Supports older standards like 802.11a/b/g, allowing compatibility with older devices. However, using legacy mode can limit the network's potential speed and capabilities.

3. **Channels:** Essentially, these are the two supported network frequencies of our APs. You can select options from the dropdown button. When you are on Radio0, the 2.4GHz frequencies are displayed and when you are on Radio1, the 5GHz frequencies are displayed.

4. **Width:** It determines the amount of frequency spectrum the AP occupies. The channel width can impact data transfer rates, capacity, and interference in the network. You need to select the appropriate width based on the AP you have chosen. Radio0 supports only 20MHz and 40 MHz.And Radio1 supports all the frequencies mentioned below.

20 MHz: This is the standard channel width and provides good compatibility and lower interference. It's commonly used in environments where there are many overlapping Wi-Fi networks.
40 MHz: This wider channel width can provide higher data rates but may also introduce more interference in crowded environments. It's usually used in networks with fewer neighboring networks.
80 MHz: This wider channel width offers even higher data rates but requires a relatively clean spectrum to operate effectively without causing interference to other networks.
160 MHz: This is an even wider channel width option, providing very high data rates. However, it requires a significant portion of clear spectrum to operate properly and is more commonly used in less congested environments.

5. **Transmit Power:** It is the signal strength of the Device. Transmit power is usually measured in decibels milliwatts(dBm) or milliwatts (mW). Higher power can extend range but might cause interference. Lower power reduces interference but limits range. It's regulated to prevent disruption. Adjusting it affects coverage and signal quality. Our APs support dynamic power control, where the device automatically adjusts its transmit power based on factors like distance to connected devices and interference levels.

5. **RSSI:** Received Signal Strength Indication (RSSI) is the minimum signal strength a device needs to maintain a reliable connection to a network. It prevents weak connections that could lead to slow or unstable data transmission. It helps devices make decisions like roaming between APs and avoiding interference. Configuring this threshold ensures a stable and efficient wireless network.

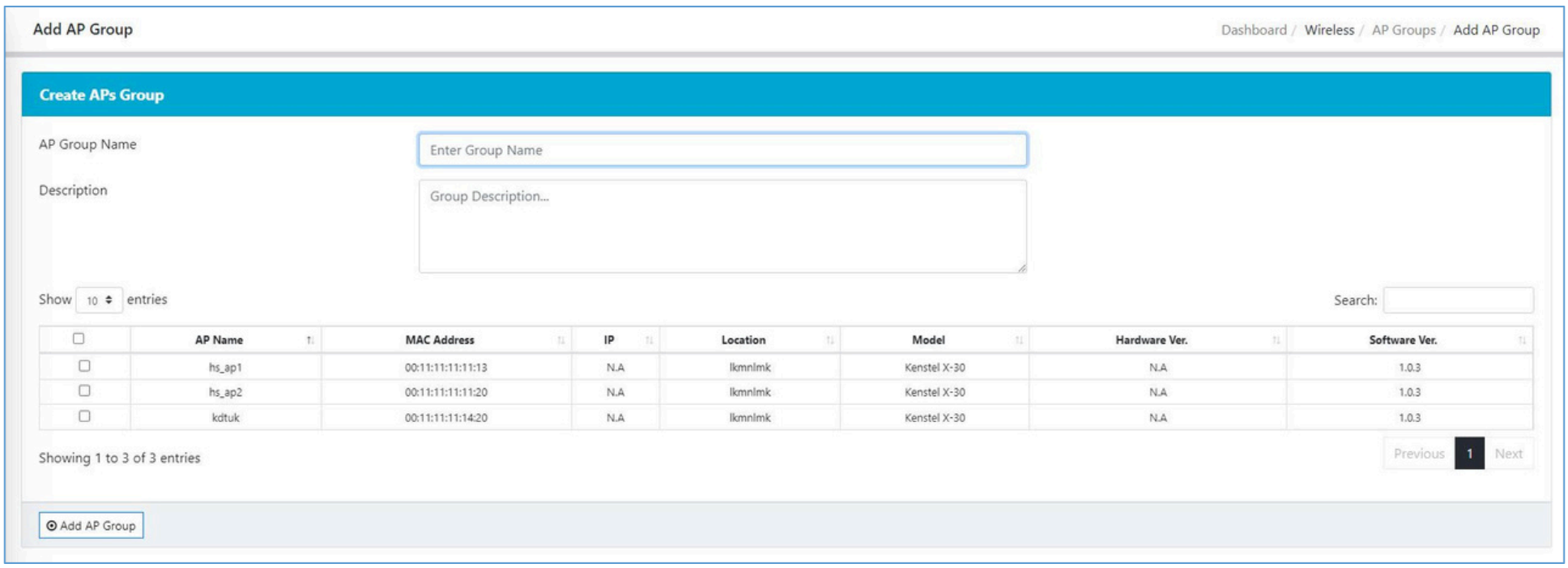
Then click on Add AP button.

Device Groups

To create an AP group go to Network → Device Group → Add New → Access Point

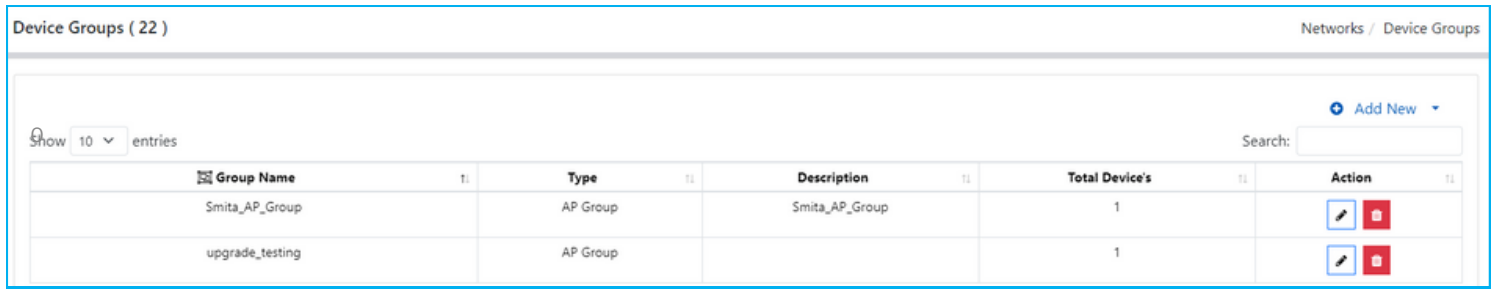
Enter a Group Name and select the APs with which you want to create a group then click on Add AP Group

Button



AP groups in a cloud controller provide a way to efficiently manage and configure Access Points in a wireless network. They offers the ability to tailor settings, improve network performance, enhance security and simplify maintenance tasks, which are essential for maintaining a robust and well-performing wireless network infrastructure.

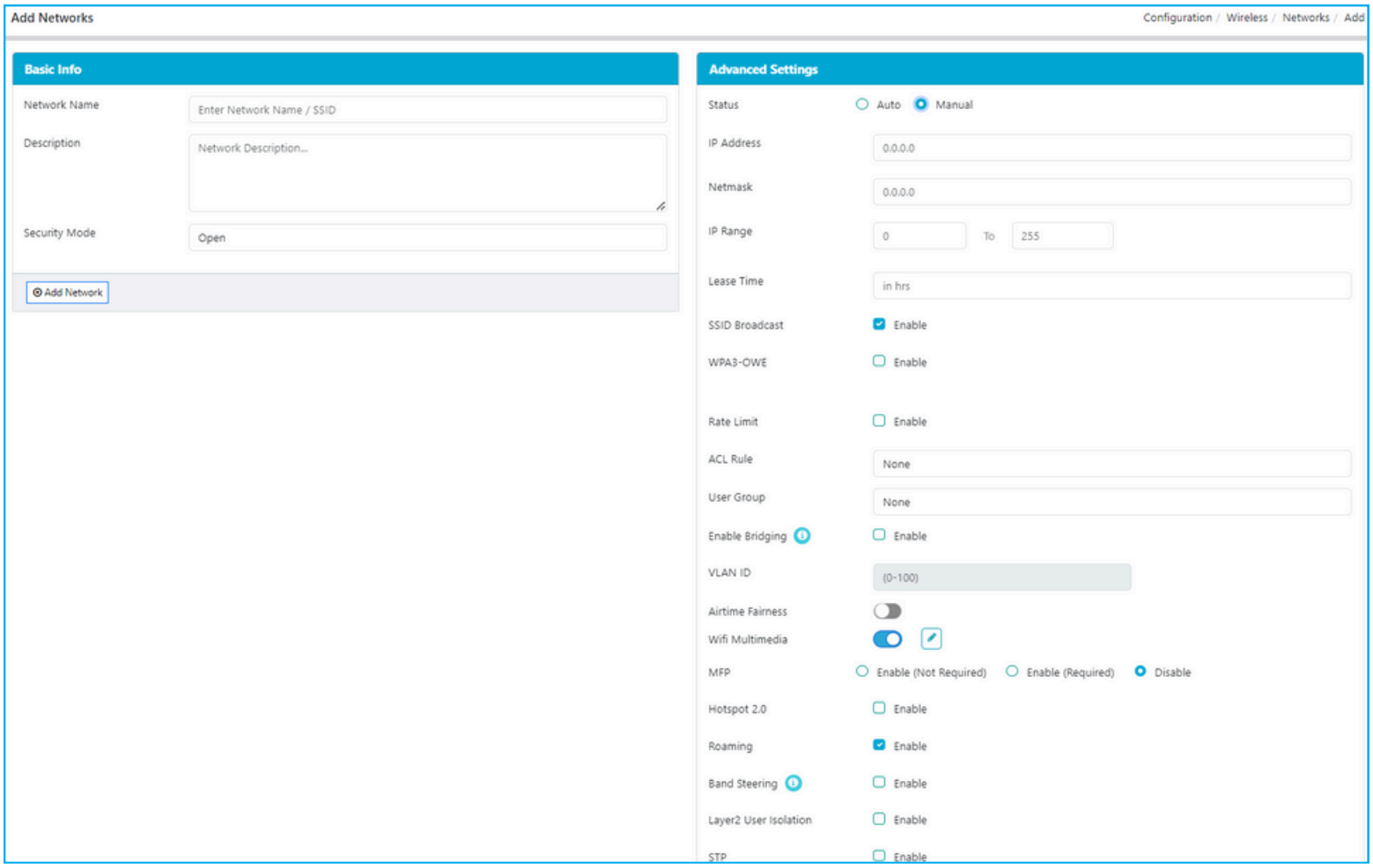
To create a group of APs, go to Network → Device Groups



To edit the group, click on any edit icon, choose the appropriate options, and finally, click the 'Update' button.

Networks

For Adding Networks go to Configuration → Wireless → Networks → Add New



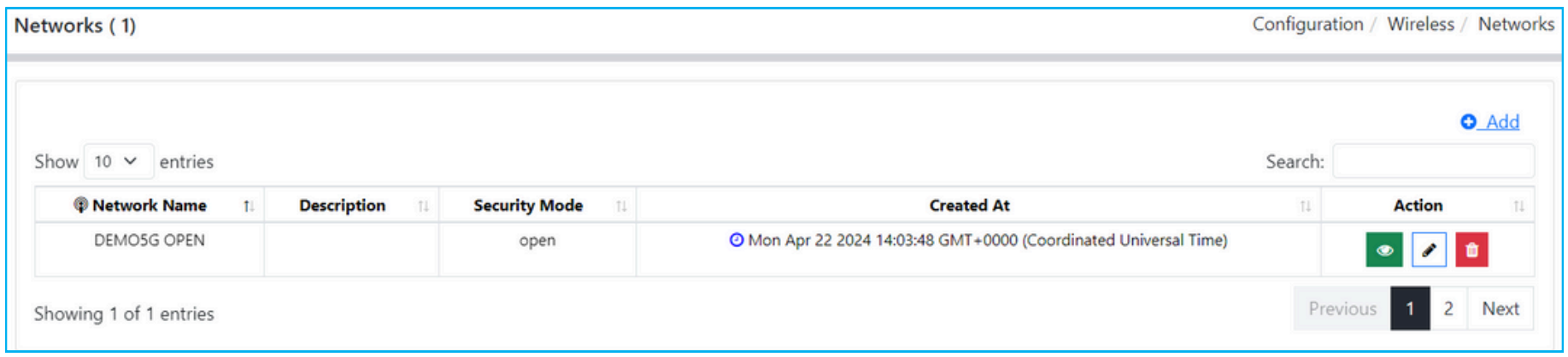
Enter the given fields and click on Add Network

Here you can choose the options of Security Mode from the dropdown button.

1. **Radius MAC:** In Radius MAC we add the Server IP, in Authentication Server Port we have to add Server Port and in Authentication Server Password we put Server Credentials.
2. **Status:** If we set the status in Auto the default IP will display and if we set the status in Manual then we have to input the details manually.
3. **SSID Broadcast:** If we enable SSID Broadcast then only our created networks will visible publically.
4. **Rate limit:** By Enable Rate limit we can set the download and upload speed limit.
5. **ACL Rule:** An "ACL rule" is a directive within an Access Control List (ACL), specifying what is allowed or denied for specific sources, destinations, protocols, and conditions in a network, system, or application. ACLs are used to control access to resources and enforce security policies. We have to add MAC Address of an individual device and then we can edit in Whitelisting or Blacklisting(only one at time).
6. **User Group:** User group settings are essential for authentication and authorization processes. When users log in, the system checks their group membership to determine what they can access.User group settings are a way to organize and manage users within a network efficiently. They help maintain security, optimize network performance, and ensure that users have appropriate access to network resources based on their roles and responsibilities. We have to go the User Group Setting and 1. Set a group name 2. Add user's MAC Address 3. Set rate limit(Download) 4.Set rate limit(Upload) and finally add this user group with the network.
7. **Bridging**: Bridging is commonly used in scenarios where Ethernet LANs need to be extended or connected, especially in large enterprise networks. It allows for the creation of larger and more flexible network topologies, helps reduce network congestion, and simplifies network management. If we enable bridging then the individual network is not shown in the Captive Portal. If we don't provide specific ID to VLAN then VLAN ID will by default get the LAN ID.

Networks

To create Networks go to Configuration → Wireless → Networks



View here the already added networks.

You can edit the network by clicking on this button.

You can delete the network by clicking on this button.

8. VLAN ID: A VLAN ID (Virtual LAN Identifier) in a network is a numerical tag that is assigned to a Virtual LAN (VLAN) to uniquely identify it within a larger network infrastructure. VLANs are used to logically segment a physical network into multiple virtual networks, allowing network administrators to control traffic, improve network security, and manage network resources more efficiently.VLAN IDs are a critical part of network segmentation and management, helping organizations optimize their network resources, enhance security, and simplify networkadministration in complex environments. If we enable bridging then only we can add VLAN ID.

9. Airtime Fairness: Airtime fairness helps to optimize the use of the wireless spectrum and ensure that all devices receive a fair share of airtime, leading to better performance and reliability in Wi-Fi networks.

10. **Wi-Fi Multimedia:** Wi-Fi Multimedia (WMM) is a feature in Wi-Fi networks that prioritizes traffic types, such as voice and video, to improve the quality of service for multimedia applications. It categorizes traffic into four access categories, uses Enhanced Distributed Channel Access (EDCA) for prioritization, and defines quality of service parameters to ensure smoother and more reliable performance for time-sensitive application.

You can edit by clicking on edit icon.

11. **MFP:** Management Frame Protection (MFP) is a Wi-Fi security feature that safeguards against attacks targeting management frames. It uses message integrity checks (MICs) to ensure the integrity and authenticity of management frames, particularly deauthentication frames, helping to mitigate potential security threats in Wi-Fi networks. You can choose the options as per your requirement.

12. **Hotspot 2.0:** Hotspot 2.0 improves the usability, security, and performance of Wi-Fi networks, making it easier for users to connect to and roam between Wi-Fi hotspots while maintaining high levels of security and privacy.

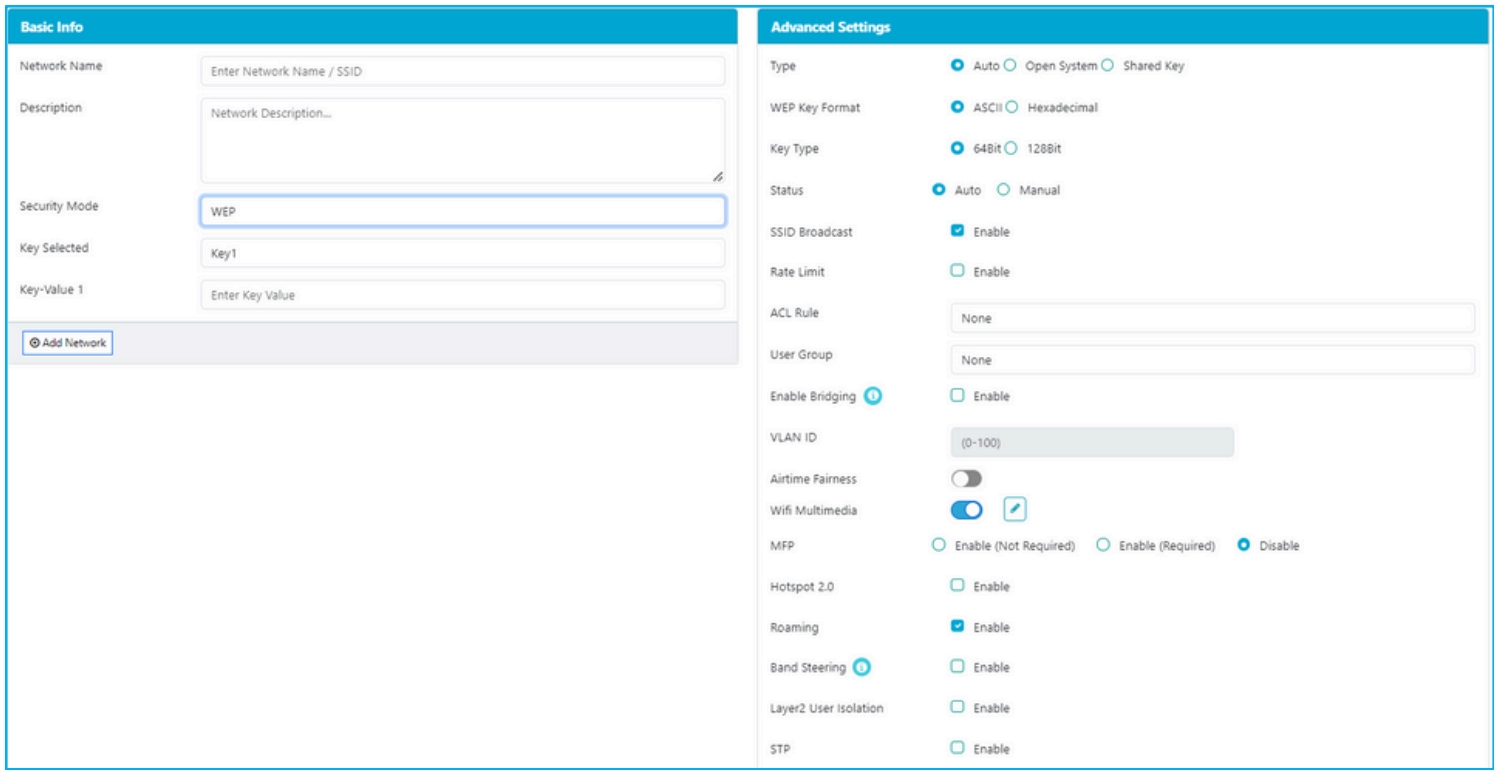
13. **Roaming:** Roaming allows your devices to roam freely between multiple AP networks without any interruption.

14. **Band Steering:** Band steering is a Wi-Fi optimization technique that encourages client devices to connect to the less congested 5 GHz frequency band instead of the 2.4 GHz band when possible. It aims to improve performance, maximize throughput, and balance client distribution across bands for a better overall user experience in wireless networks.

15. **Layer 2 User Isolation:** Layer 2 user isolation, achieved through VLAN segmentation, enhances network security, control, and performance by restricting communication between devices within the same VLAN while allowing for efficient routing and communication between VLANs.

16. **STP:** STP stands for Spanning Tree Protocol. It is a network protocol used to prevent loops in Ethernet networks, which can cause broadcast storms and lead to network instability.

Networks



WEP was designed to provide a level of privacy and security for wireless networks that was supposed to be equivalent to that of a wired network. It used a shared key authentication system and encryption to protect data transmitted over the wireless network. However, several vulnerabilities were discovered in WEP over the years, making it relatively easy for attackers to crack the encryption and gain unauthorized access to a network.

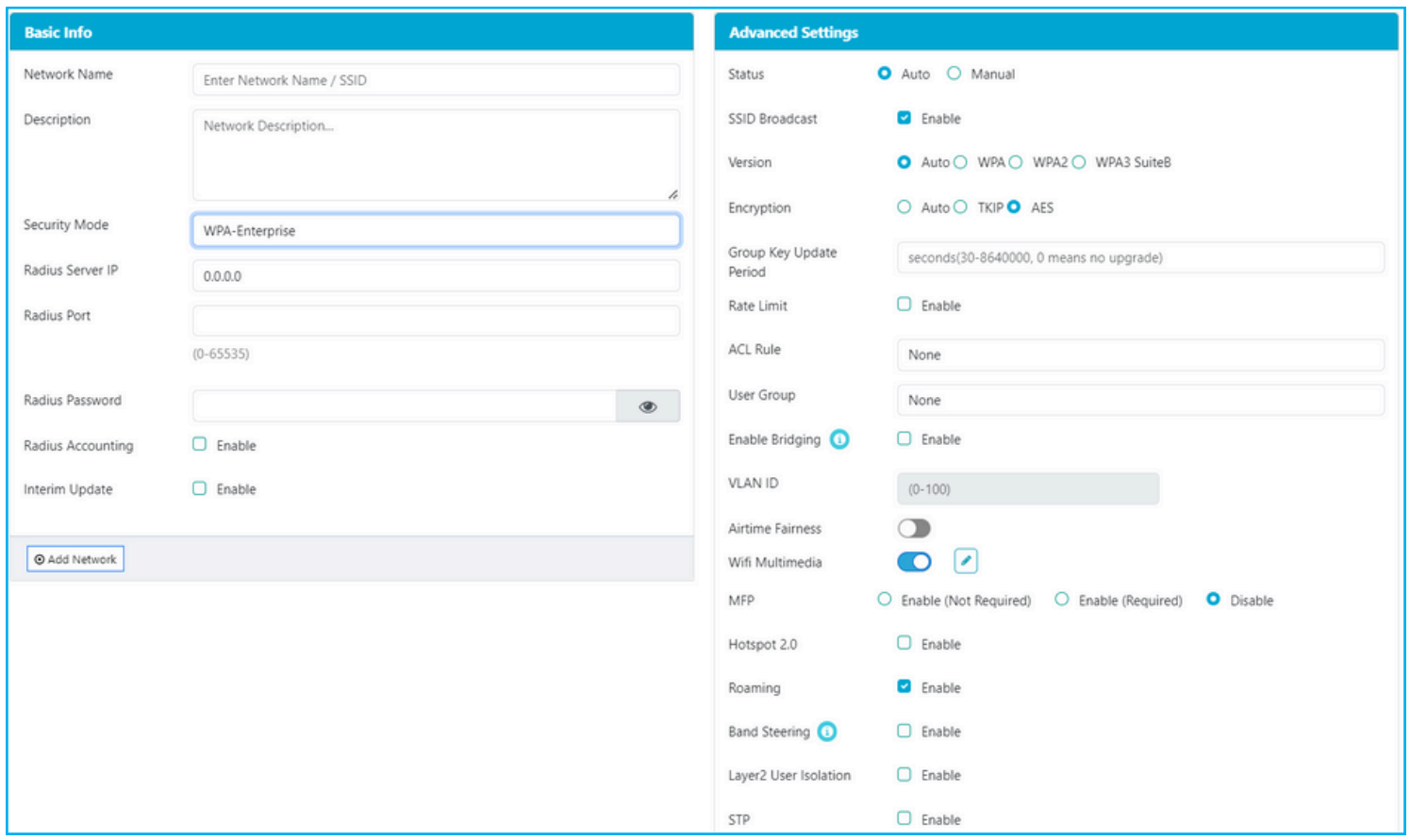
Due to these vulnerabilities, WEP has been widely replaced by more secure protocols such as WPA (Wi-Fi Protected Access) and its successors, including WPA2 and WPA3, which offer much stronger security features.

Key Selected: In Key Selected, you can choose Key options from the dropdown button. And then set a password in Key 1 and the same password should be used in Key 2 Key 3 and Key 4.

WEP Key Format: ASCII and Hexadecimal keys typically refer to different types of encryption keys used to secure wireless networks. ASCII keys are typically made up of letters (both uppercase and lowercase), numbers, and other special characters. These keys are usually easier to remember but may be less secure compared to hexadecimal keys. A hexadecimal key, on the other hand, is a key composed of hexadecimal digits, which include the numbers 0-9 and the letters A-F (or a-f). Hexadecimal keys are often used when a stronger level of security is required for a wireless network.

Key Type: A 64-bit key is relatively short and provides relatively low encryption strength. And a 128-bit key is much stronger than a 64-bit key and is considered secure for most applications.

Networks



Version:-

WPA (Wi-Fi Protected Access): An older Wi-Fi security standard that improved upon WEP but is now considered insecure due to vulnerabilities. WPA2 (Wi-Fi Protected Access 2):A widely used Wi-Fi security standard that uses AES encryption and provides enhanced security compared to WPA.

WPA3 (Wi-Fi Protected Access 3): The latest Wi-Fi security standard with even stronger encryption and improved security features, making it the most secure choice.

Suite B: A set of cryptographic standards approved for securing sensitive information, including encryption algorithms, but not specificto Wi-Fi security standards.

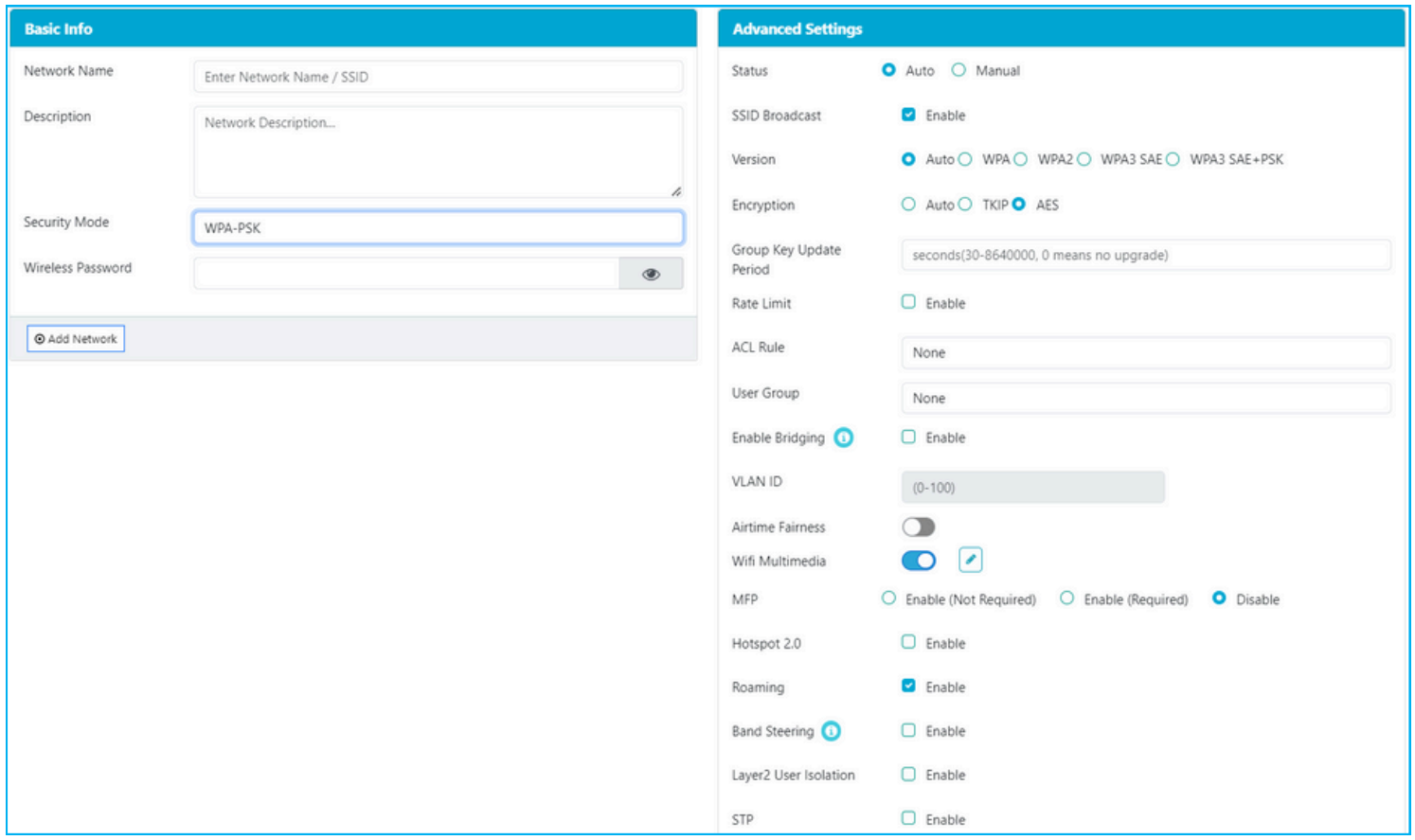
Encryption:-

TKIP: For encryption, Temporal Key Integrity Protocol is more secure than WEP but still had some vulnerabilities.

AES: Advanced Encryption Standard on the other hand, is considered highly secure.

Group key Update Period:- The Group Key Update Period determines how often the group key used for encrypting multicast and broadcast traffic in Wi-Fi networks is refreshed. This periodic rotation helps enhance security by reducing the risk of key compromise while balancing the impact on network performance.

Networks

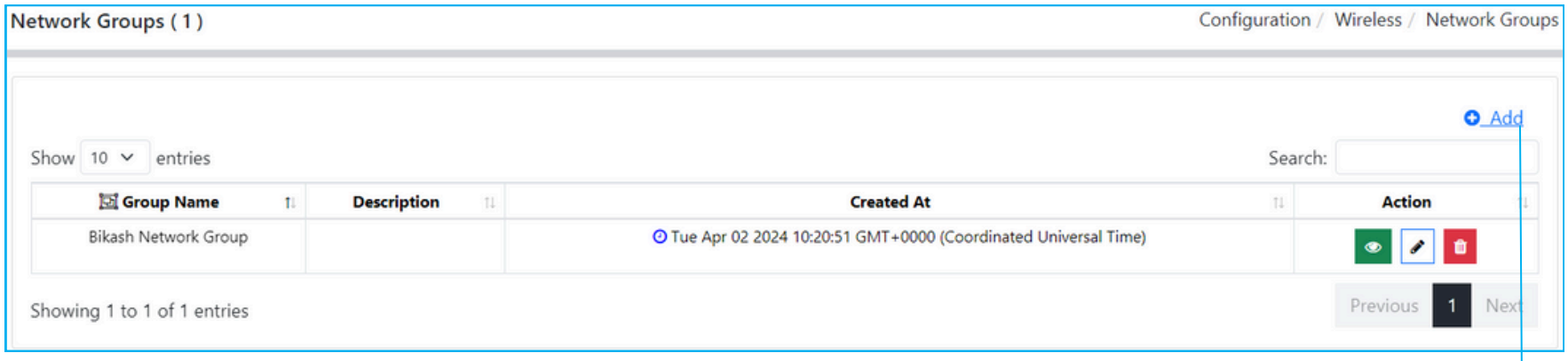


WPA3 SAE: SAE is a key exchange protocol used in WPA3 for securing the initial connection between a device and a Wi-Fi network. SAE ensures that both the client device and the access point mutually authenticate each other, preventing man-in-the-middle attacks during the initial connection setup.

PSK (Pre-Shared Key): PSK is a passphrase or shared secret key that is used to authenticate and encrypt the connection between the client device and the access point. It is more convenient for home and small office networks as it eliminates the need for a complex and individualized key setup for each device. But when you use WPA3 SAE+PSK security, you get the robust security benefits of WPA3 SAE during the initial connection setup while still using a pre-shared key for convenience, especially in small-scale network deployments.

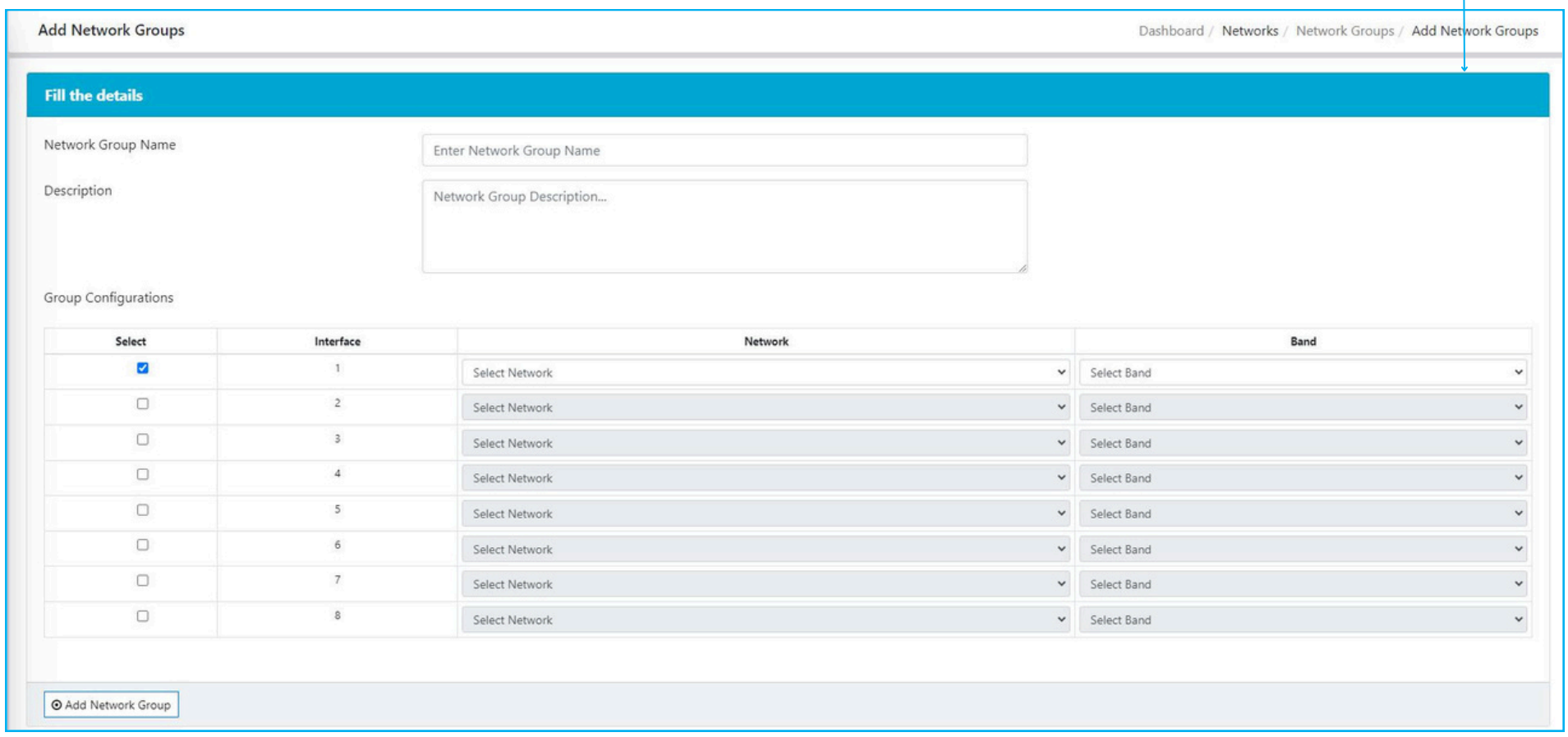
Network Groups

To create Network Groups go to Configuration → Wireless → Networks Groups



Here you able to see the history of already created groups.

Enter the required fields, then select the Networks with which you want create a group and select the network band then click on Add Network Group button.

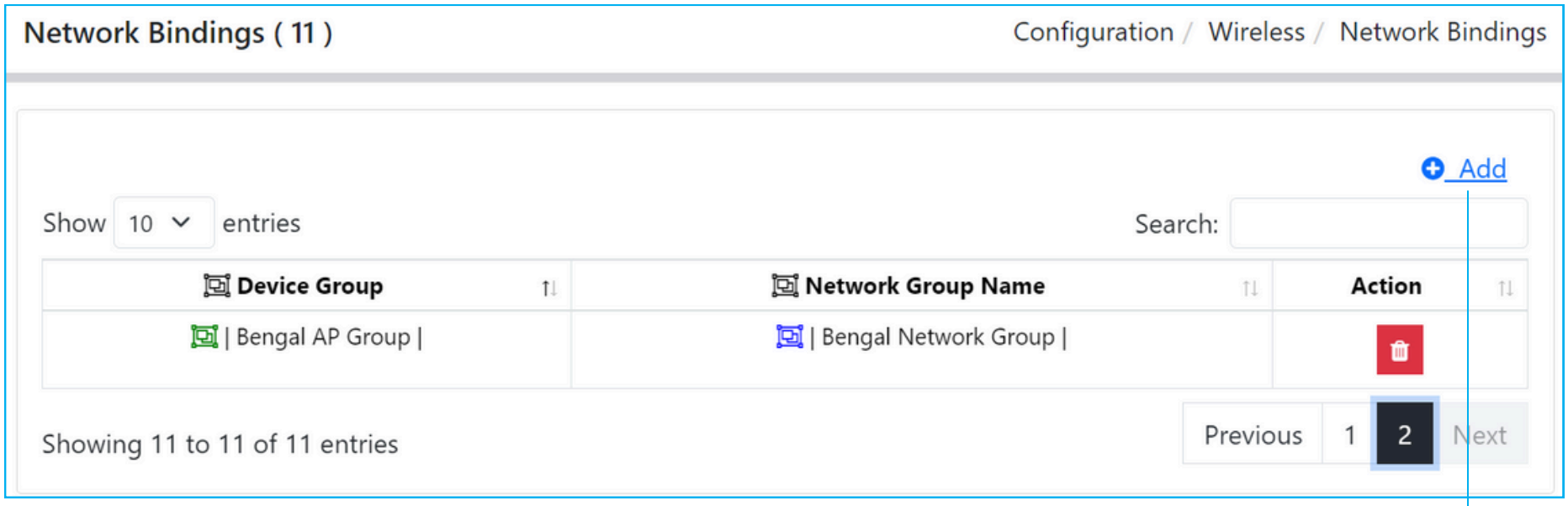


Bands: Choose bands from the dropdown according to your preference. Select bands to 2.4 GHz or 5 GHz or both.

Creating network groups or similar constructs in cloud controllers helps with resource organization, security, scalability and overall management of your cloud infrastructure. It allows you to logically group related resources, control their communication, and apply policies consistently.

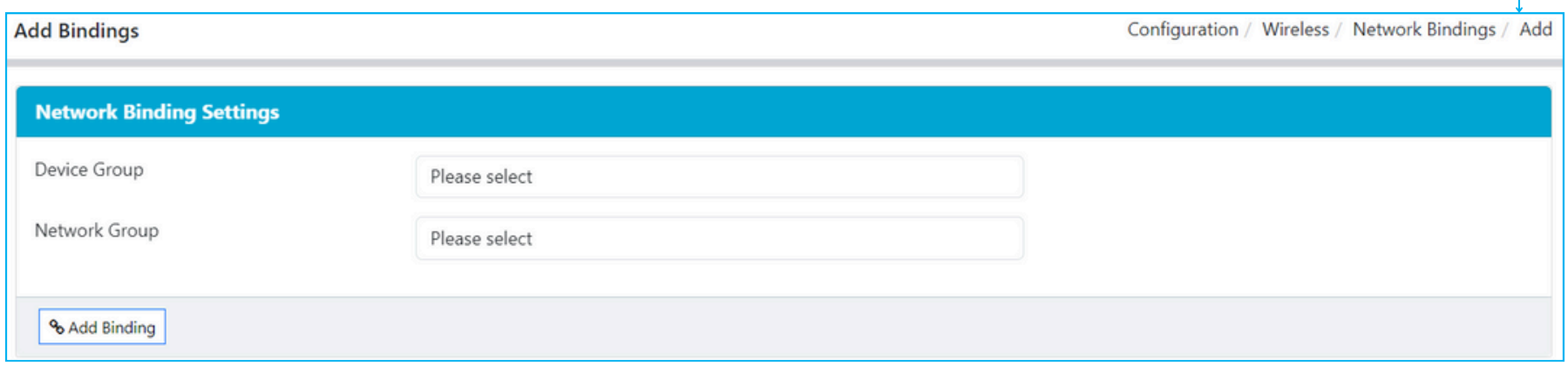
Network Binding

To create Network Groups go to Configuration → Wireless → Networks Binding



Here you able to see the already binded Networks.

Please select the Device Group and Network Group which you want to bind then click on Add Binding.



Binding Device groups and network groups together in a cloud controller offers simplified management, consistent configuration, network segmentation, load balancing, event reporting, scalability, policy enforcement, and flexibility in handling access points and their associated network segments.

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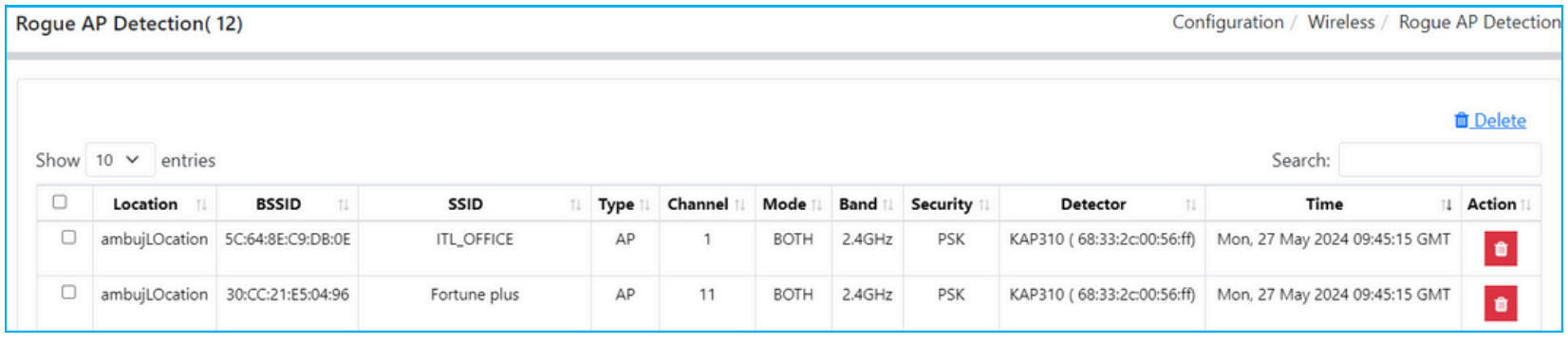
Rouge AP Detection

To create Network Groups go to Configuration → Wireless → Rouge AP Detection



A Rogue Access Point (Rogue AP) refers to an unauthorized or malicious access point that has been installed on a network without proper authorization or knowledge of the network administrator. The Rogue AP detection system actively monitors the network for any unapproved or rogue access points.

Location: Here you able to see the location of the Rouge AP.

BSSID: In the case of a rogue access point (Rogue AP), a BSSID (Basic Service Set Identifier) is a unique identification assigned toa wireless access point. BSSIDs are important for network administrators to differentiate between legitimate access points and unauthorized rogue ones.

SSID: In the context of a rogue access point (Rogue AP), an SSID (Service Set Identifier) is the name of a wireless network. Rogue access points may use misleading or fake SSIDs to trick users into connecting to them. Monitoring and identifying suspicious or unauthorized SSIDs are essential to detect rogue access points and mitigate potential security risks.

Type: A Rogue AP (Rogue Access Point) can take on various forms and poses a potential security threat to a wireless network. Rogue APs can be classified based on their intent and origin. Here are common types of Rogue APs:

Malicious Rogue APs: Intentionally set up by attackers to gain unauthorized access or launch malicious actions.

Neighbor Rogue APs: Unauthorized neighboring access points that unintentionally intrude into a network.
Ad Hoc Networks: Informal networks created by devices within the network, potentially causing security vulnerabilities.
Misconfigured APs: Access points not properly configured or secured, making them susceptible to misuse.
Authorized APs with Security Issues: Network access points with security vulnerabilities or compromises that act as rogue APs. Portable Hotspots and Tethered Devices: Personal hotspots or tethered smartphones that unintentionally act as rogue APs, bypassing corporate security.
Evil Twin APs: Rogue APs that mimic legitimate networks to deceive users and capture sensitive information

Type: Rogue access points (rogue APs) can operate in various modes:

Standalone Mode: Operating independently, not part of any legitimate network infrastructure.
Evil Twin Mode: Mimicking a legitimate access point to deceive users and potentially compromise their data.
Ad Hoc Mode: Creating a direct wireless connection between devices, often without a central access point.

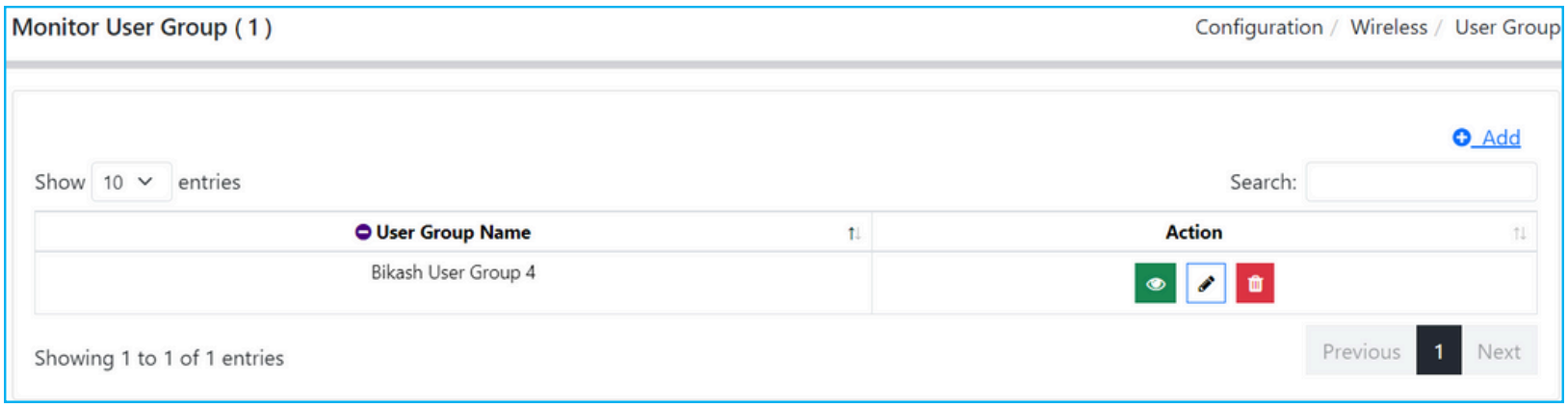
Band: Rogue access points can operate on either the 2.4 GHz band, the 5 GHz band, or both. The specific band a rogue AP operates onwill depend on its configuration and the wireless capabilities of the device hosting the rogue AP. Detection and identification ofrogue APs across these bands are essential for network security, performance optimization, and interference management.

Security: Security in the context of rogue access points (rogue APs) is a critical concern because these unauthorized or maliciously deployed access points can pose serious threats to network integrity and data security. Implementing robust security measures to detect, prevent, and mitigate rogue APs is essential. Securing against rogue access points (rogue APs) involves:

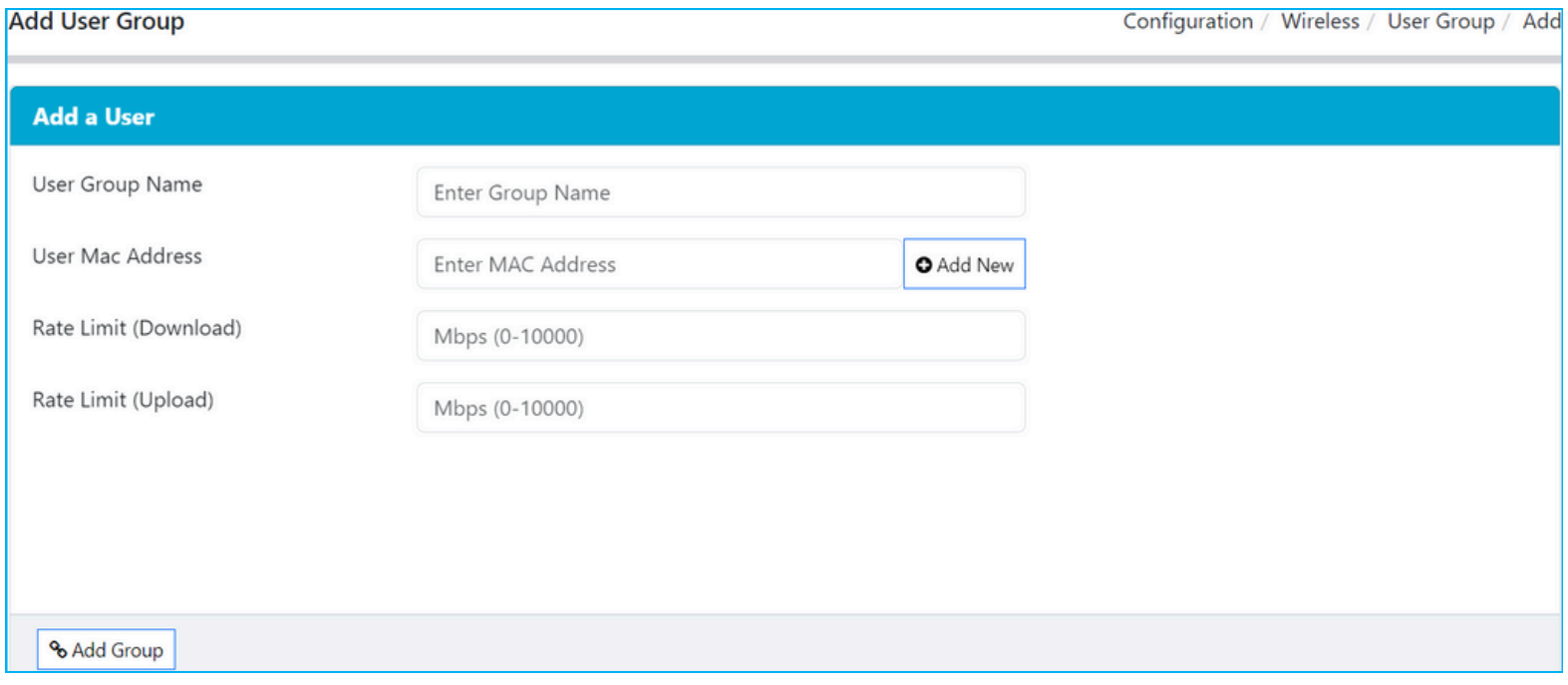
Detection and Monitoring: Use WIDS/WIPS to monitor and detect rogue APs.
Authentication and Encryption: Utilize strong authentication (WPA3) and encryption (AES) standards.
Access Control: Implement strict access control policies and MAC address filtering.
Intrusion Prevention: Employ mechanisms to prevent suspicious activities associated with rogue APs.
Regular Audits: Conduct frequent audits and scans to detect rogue APs.
Employee Education: Train employees to recognize and avoid connecting to rogue APs.
Policy Enforcement: Enforce clear wireless network usage policies.
Incident Response Plan: Develop a plan to respond swiftly to rogue AP incidents.
Physical Security: Ensure physical security of network equipment to prevent unauthorized access.

User Group

To create User Groups go to Configuration → Wireless → User Group



A user group refers to a logical grouping or categorization of users with similar characteristics, permissions, or access levels. These groups make it easier to manage and control access to resources, services, and applications within the cloud infrastructure.



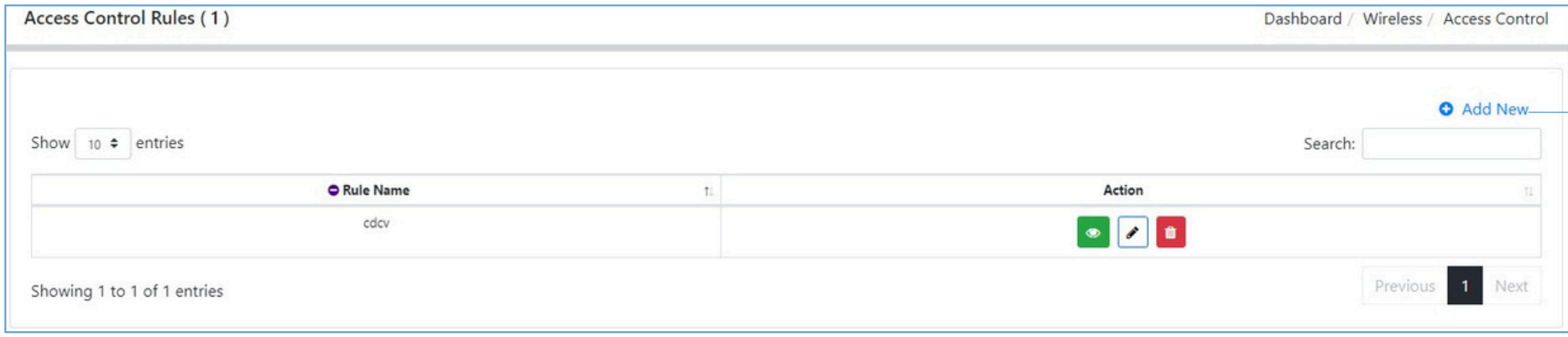
User Group Name: Input a name for the group identification.

User MAC Address: Input the MAC Address of the user with which you want to make a User Group. Here you can multiple MAC Addresses.

Rate Limit: Here you can set the rate limit of download and upload speed within 0 to 10000.

Access Control

Configuration → Wireless → Access Control

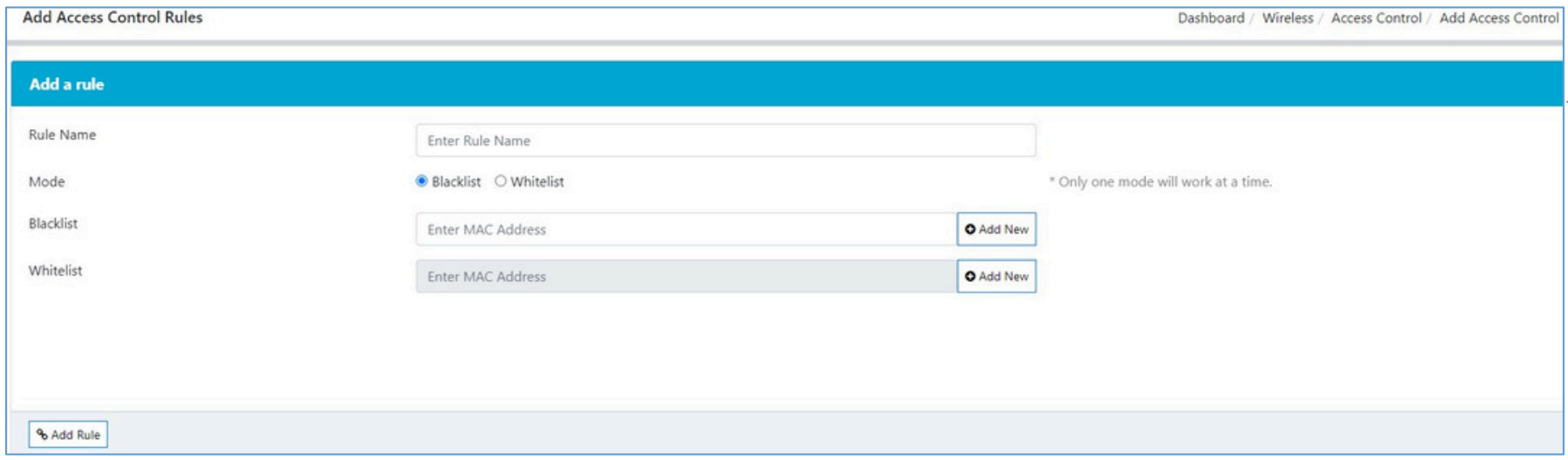


Access control is a fundamental security measure that involves managing and regulating access to resources (such as systems, applications, data, or physical locations) within an organization. The goal of access control is to ensure that only authorized individuals or systems can access and interact with specific resources, while unauthorized access is prevented or restricted.

Click to view the settings.

Click to edit the settings.

Click to delete the settings.



Rule name: A rule name refers to a descriptive identifier assigned to a specific access control rule or policy. A rule name is a human- readable label that helps administrators, security personnel, and other stakeholders easily identify and understand the purpose of a particular access control rule within a system or security infrastructure.

Mode: Enable the mode either in Blacklist or Whitelist

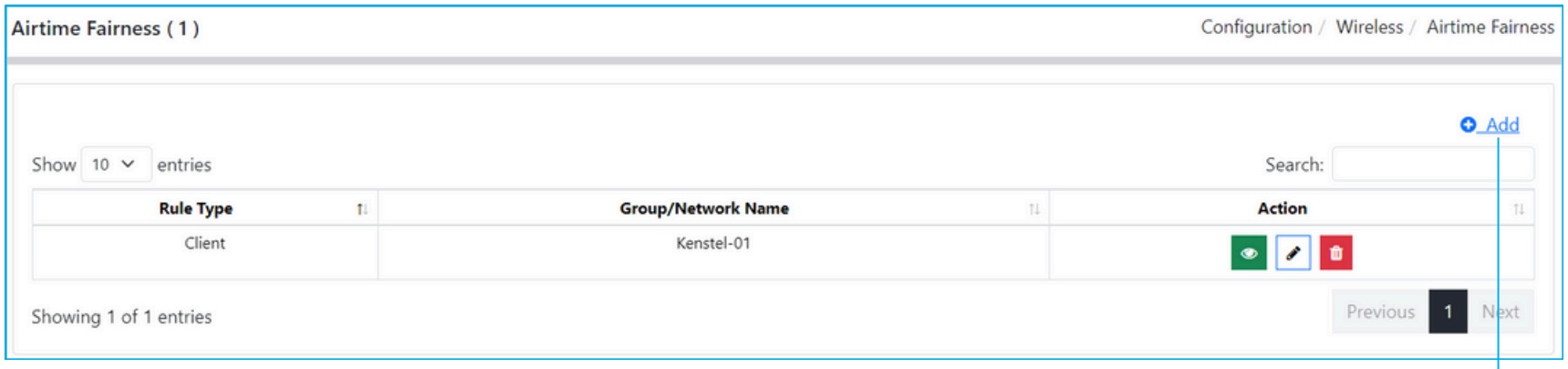
Blacklist: Enter the MAC Address which you want to block. Here you can add multiple MAC Addresses by clicking on Add New

Whitelist: Enter the MAC Address which you want to allow . Here you can add multiple MAC Addresses by clicking on Add New

Airtime Fairness

Configuration → Wireless → Airtime Fairness

Airtime Fairness refers to a feature that ensures fair distribution of available airtime (communication time) among connected devices. This is particularly important in wireless networks to prevent certain devices from dominating the available airtimeand causing performance issues for other devices.



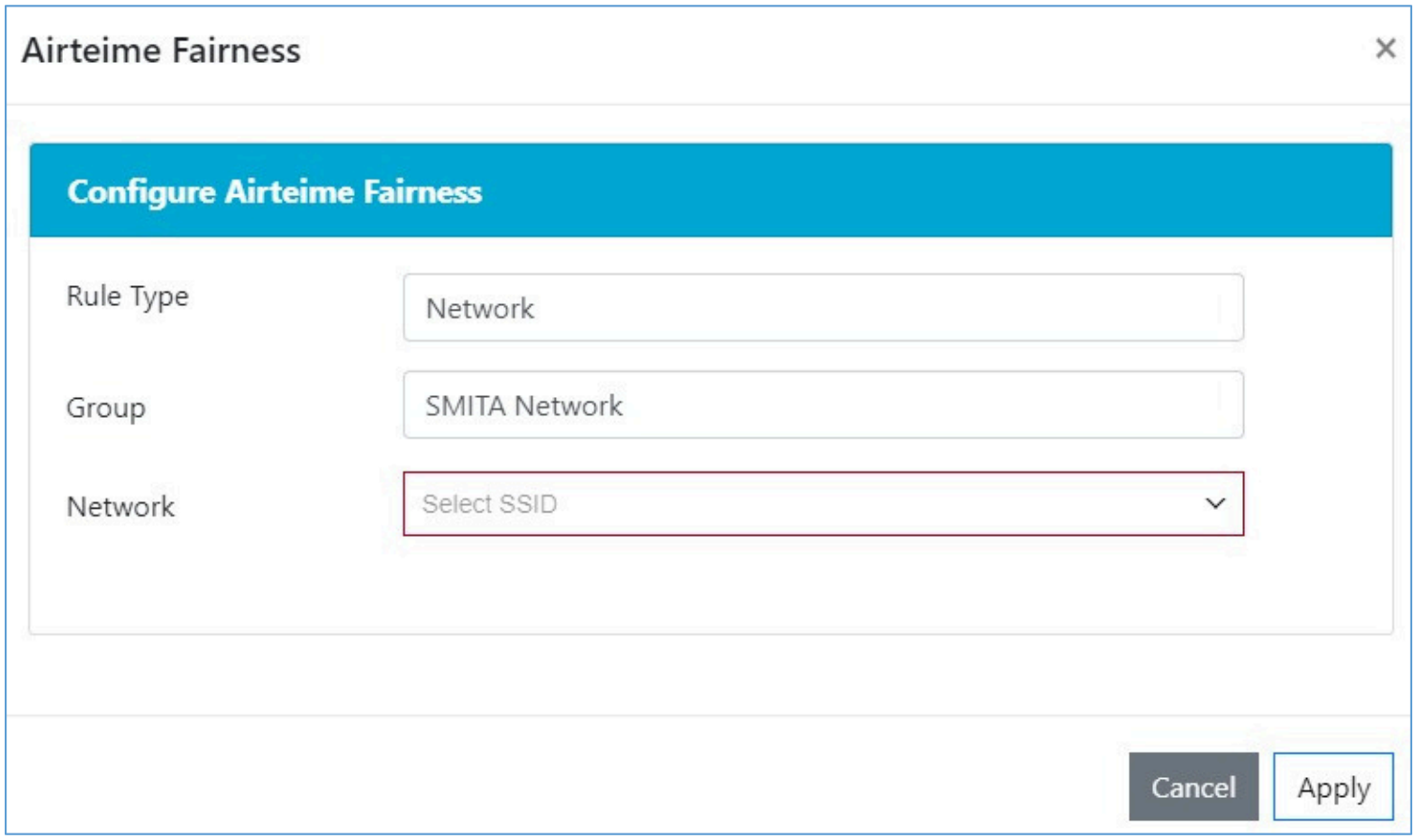

Click to view the settings.


Click to edit the settings.


Click to delete the settings.

To add more networks click on Add button.

Here, you can add more networks/ network groups.



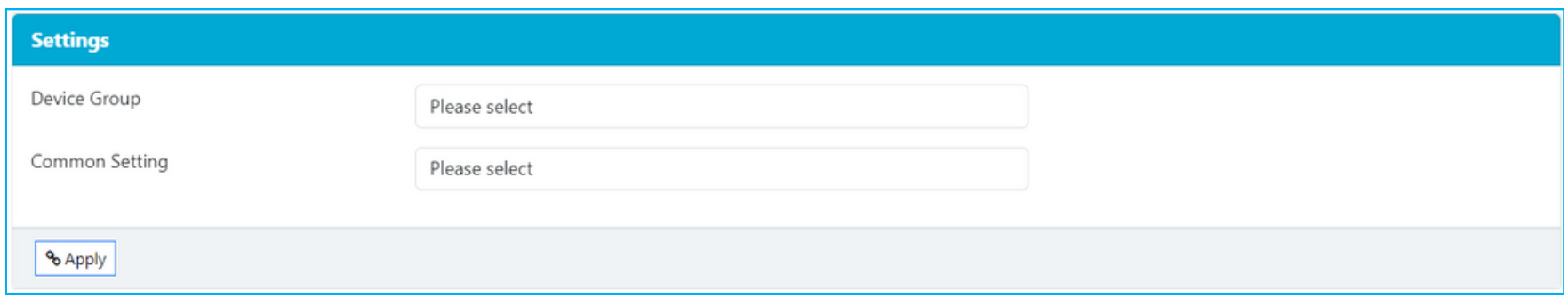
Rule Type: Select network from the drop down.

Group: Select network group from the drop down.

Network: Select networks that are present within the above network group.

Common Device Setting

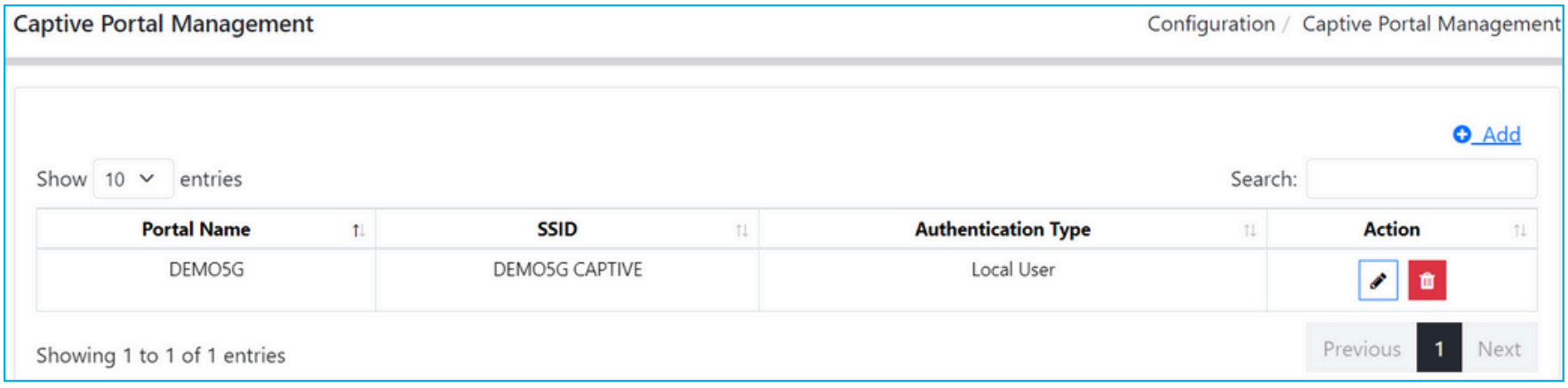
Configuration → Wireless → Common Device Setting



Select both the options from the drop down and click on Apply.

Captive Portal

To Add Captive Portal go to Configuration → Captive Portal



A captive portal in the context of a cloud controller typically refers to a network security feature used to authenticate andmanage access to a wireless or wired network. Captive portals are commonly used in public Wi-Fi networks, such as in hotels, airports, coffee shops, or other public places, to control access to the internet or network resources.

Benefits of Captive portal:

1. **Access Control:** Ensures that only authorized users can access the network or internet resources.

2. **Security:** Requires users to authenticate or accept terms of use, reducing the risk of unauthorized access.

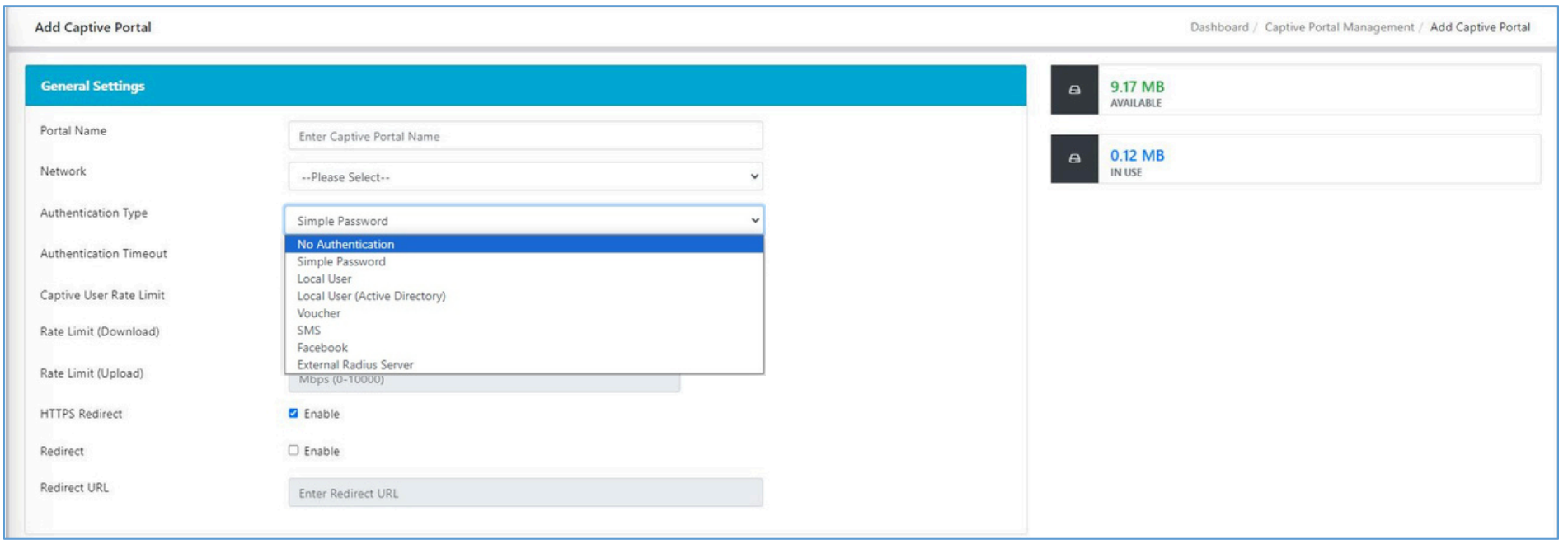
3. **User Tracking:** Monitors user activity and enforces network policies.

4. **Customization:** Can display branding, advertisements, or specific messages.

5. **Compliance:** Helps organizations meet legal requirements, such as providing terms of use agreements.

Captive Portal

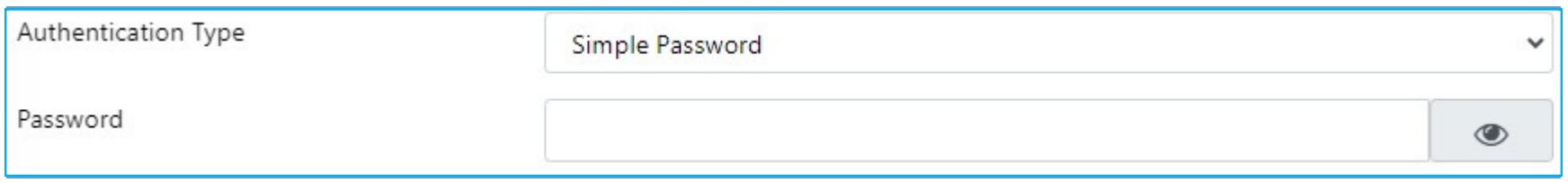
Configuration → Captive Portal → Add New → General Settings



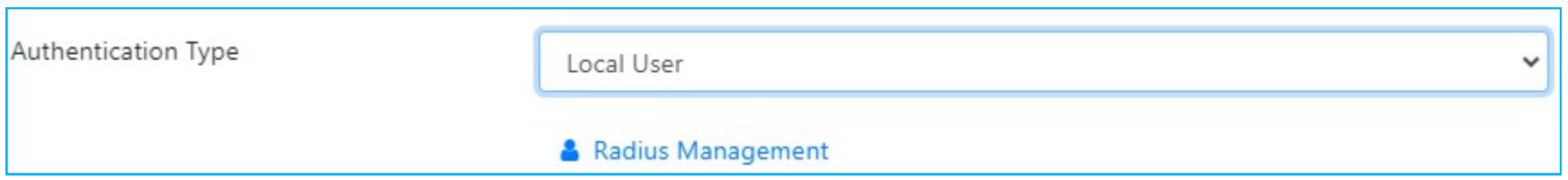
Select the network, enter the selected network name in the 'Portal Name,' and then choose the authentication type from the dropdown menu. Select the option according to your preference. The details of the authentication type differ with every option, so fill them in. Set the login page and then click on the 'Apply' button.

Authentication Type

Simple Password: Here you can put any kind of password.



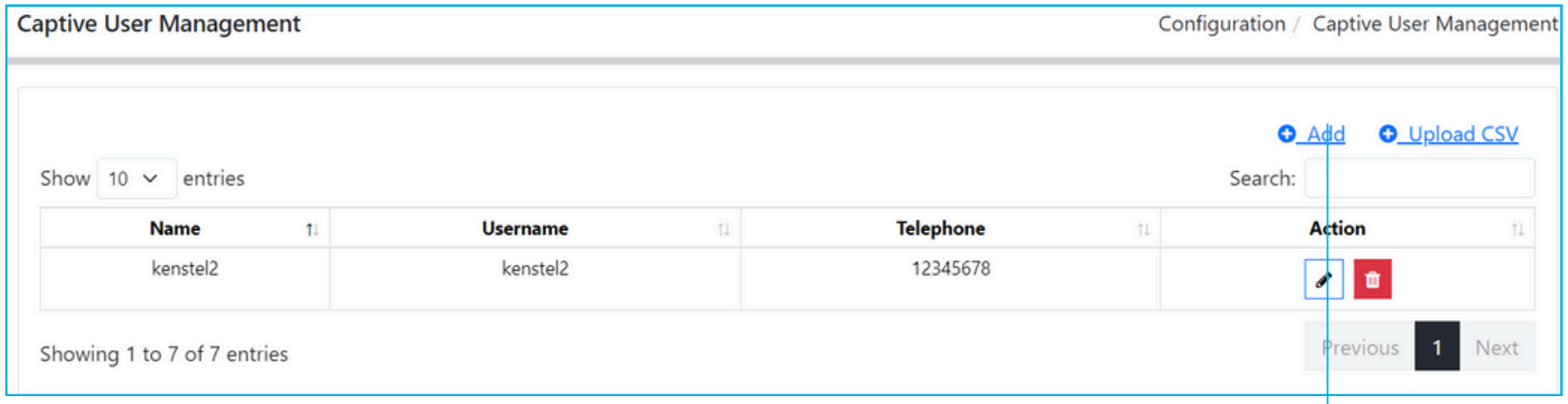
Local User: Once you fill all the details click on Apply button then click Radius Management to go Radius Management Settings.

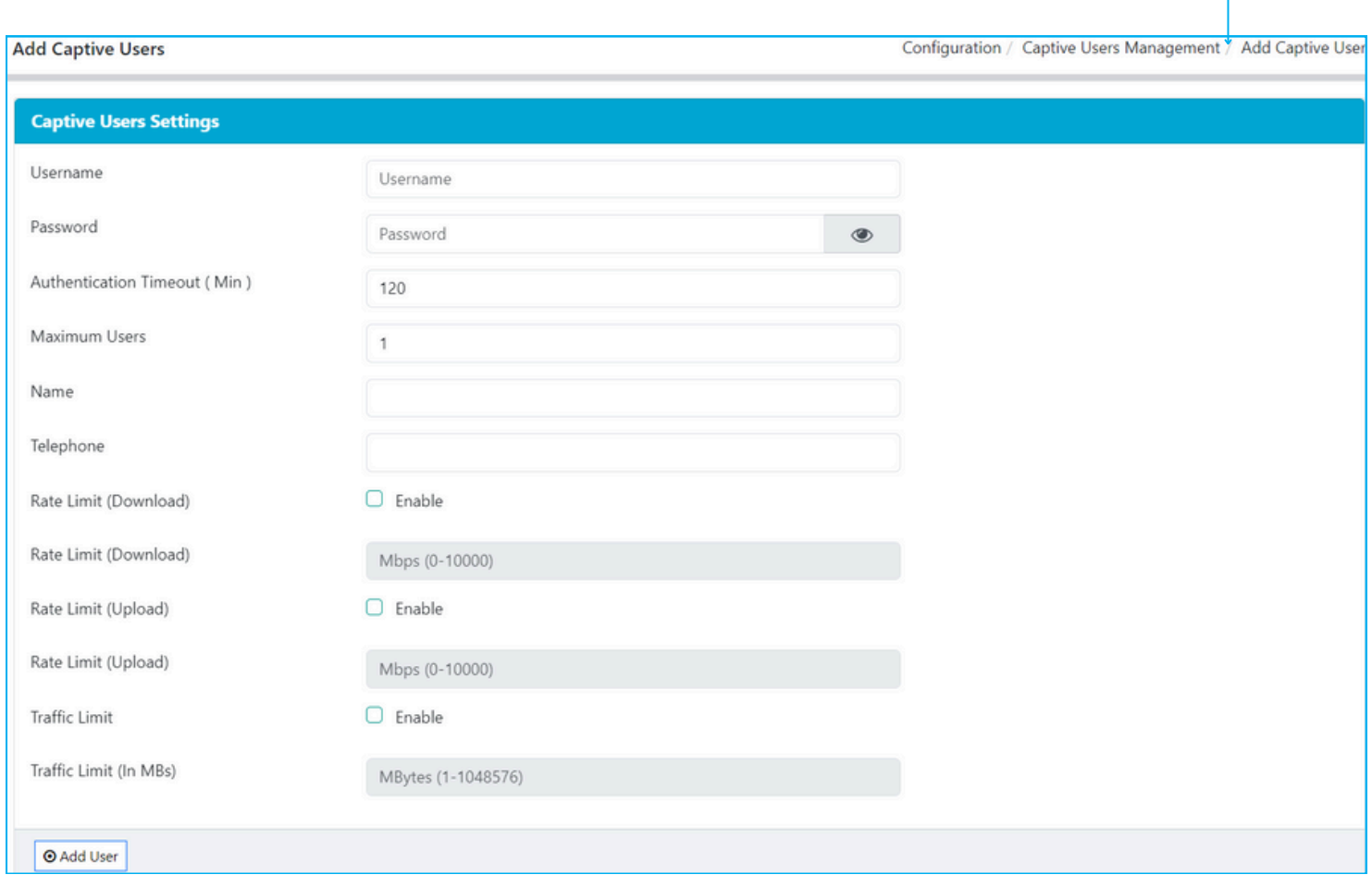


Captive Portal

Captive User Management

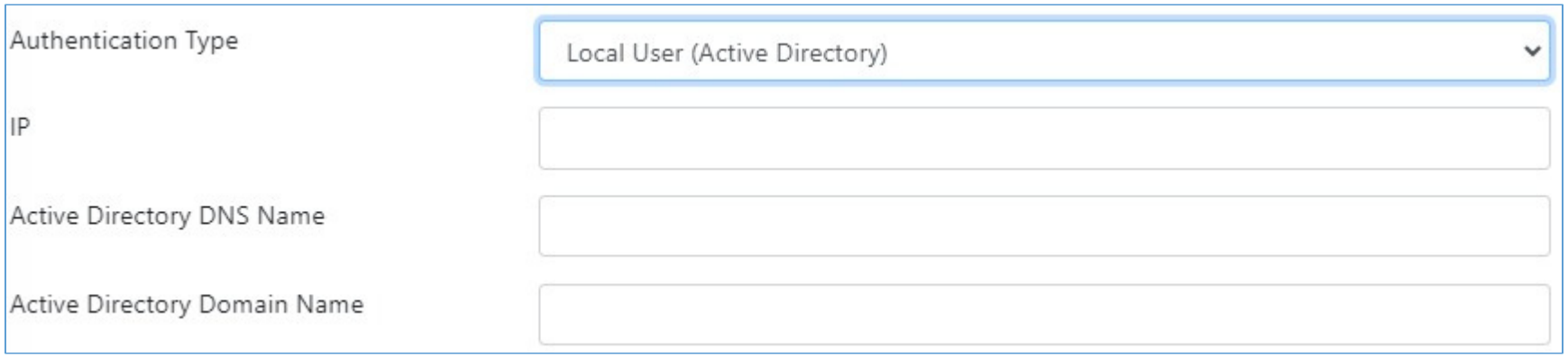
Configuration → Captive User Management



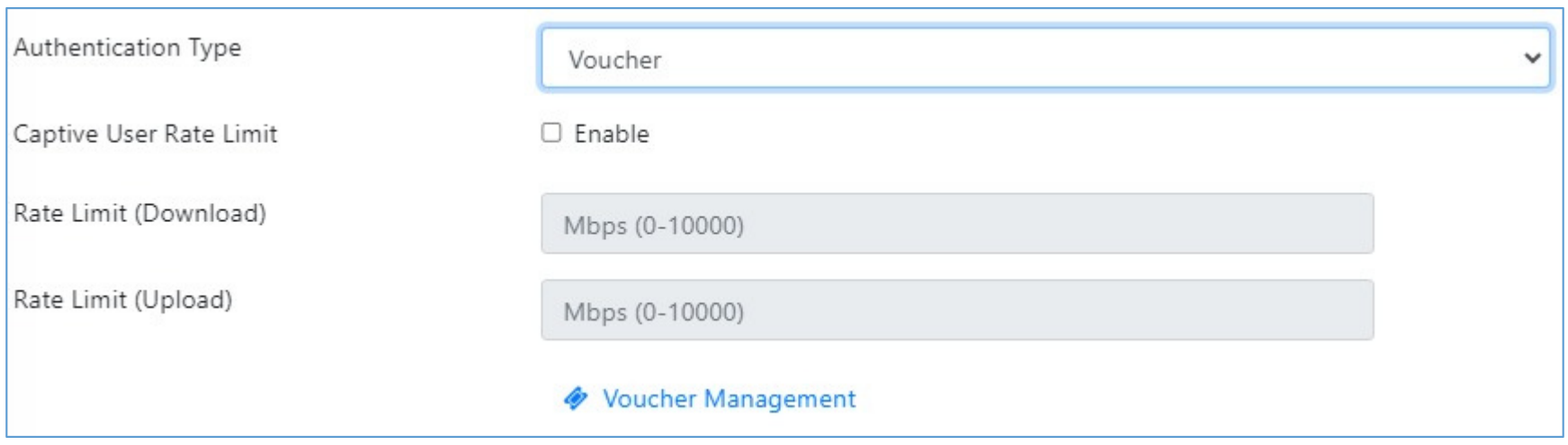


Fill the credentials and click on Add User button.

Local User (Active Directory): Fill the credentials below.



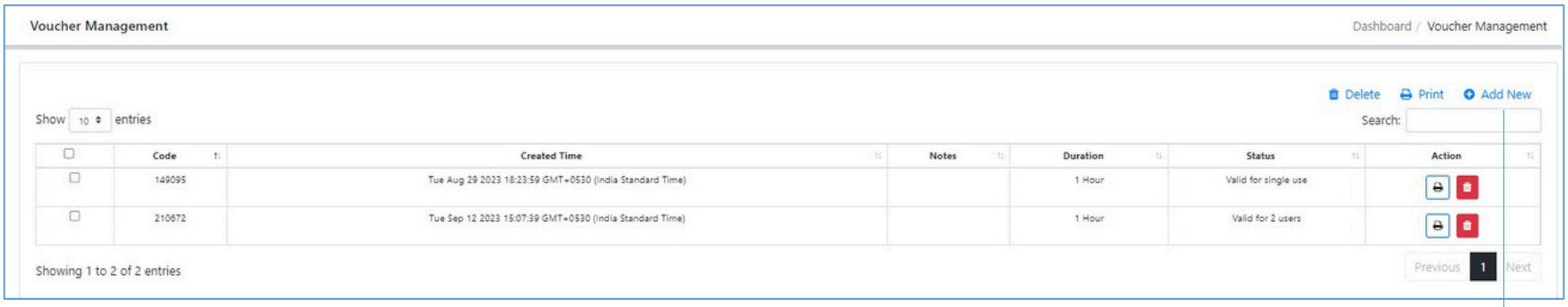
Voucher: Once you fill all the details click on Apply button then click on Voucher Management to go Voucher management Settings.



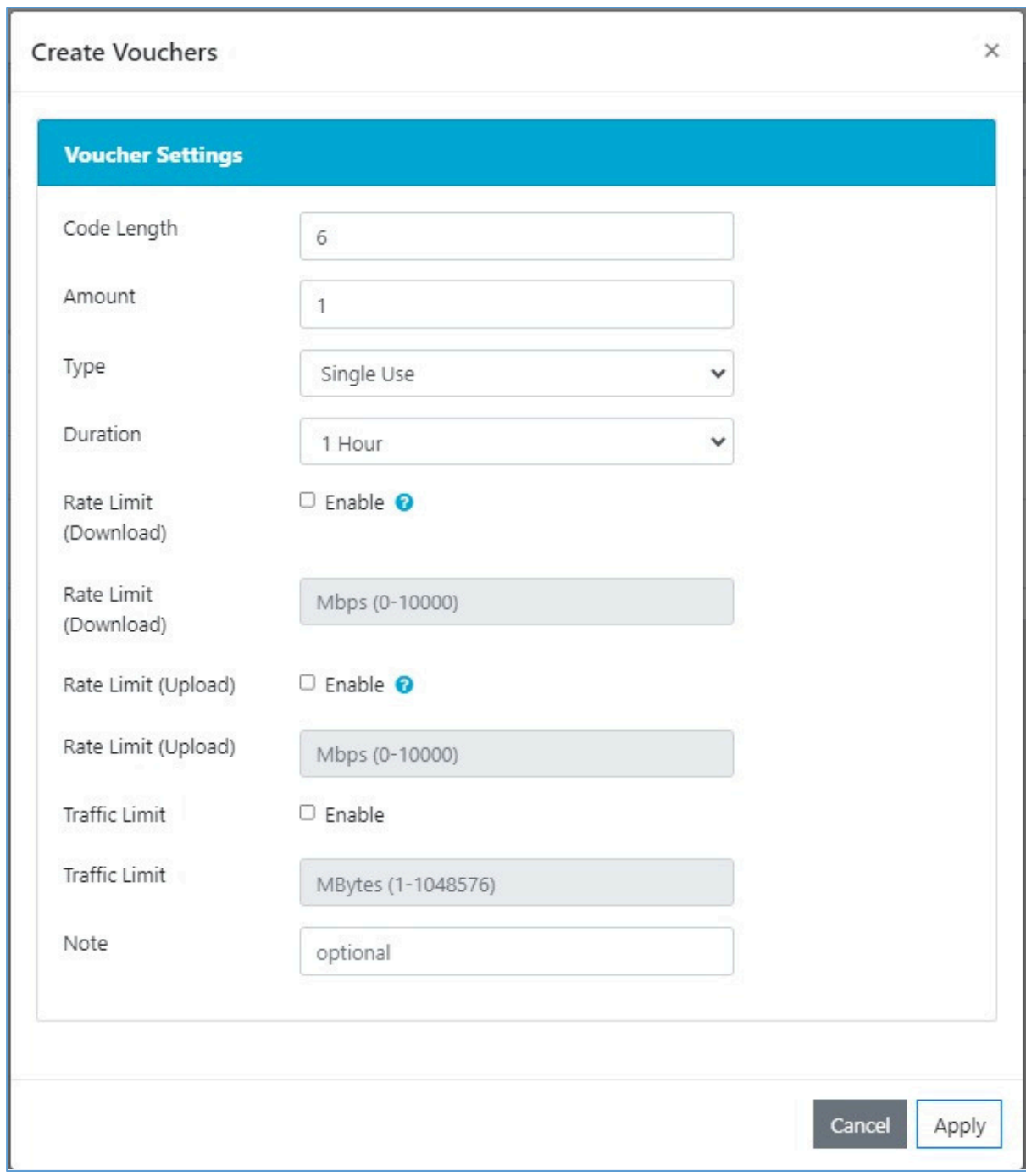
Captive Portal

Voucher Management

Configuration → Voucher Management

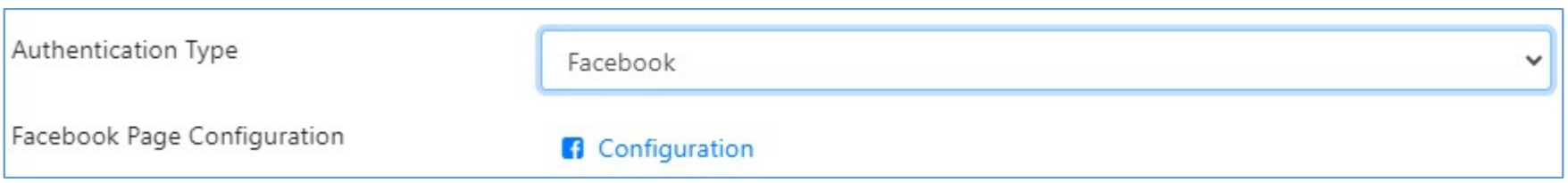


Fill the details and click on Apply to Create voucher.

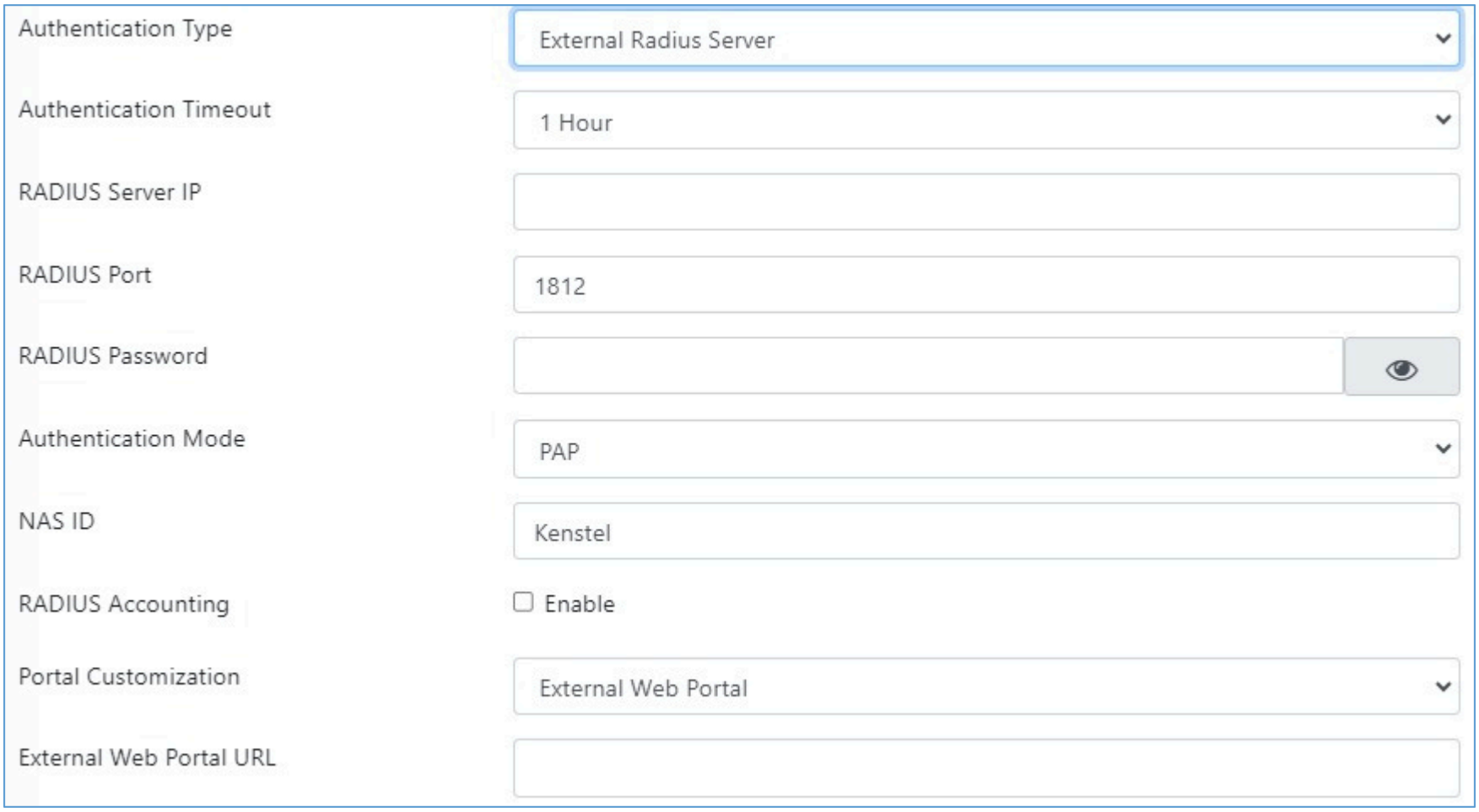


SMS: Go to Twilio Website, generate your TwilioSID and AuthToken then put it below. Also put the Mobile number. Lastly set the user limit and country code then Apply.

Facebook: After filling all the details click on Apply button. And then click on Configuration to go to Facebook Page.

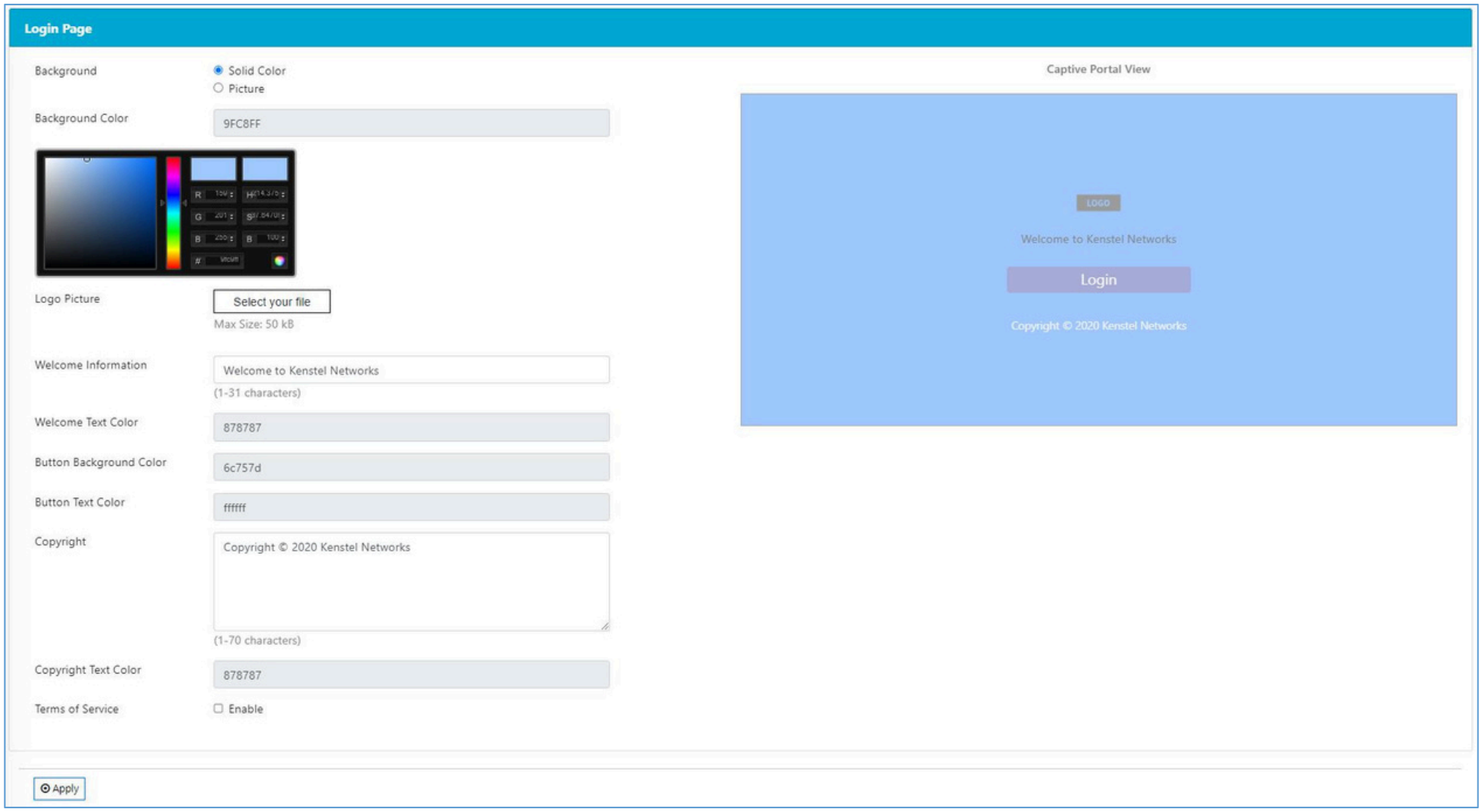


External Radius Server:



Captive Portal

Configuration → Captive Portal → Add New → Login Page

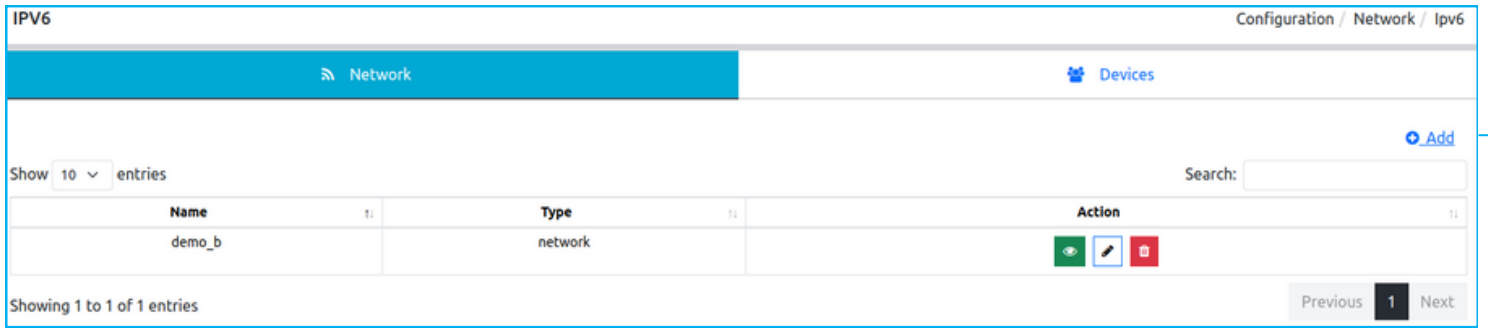


When you connects to a network with a captive portal, then you redirected to a login page. In the above showing page you can edit your login page UI.

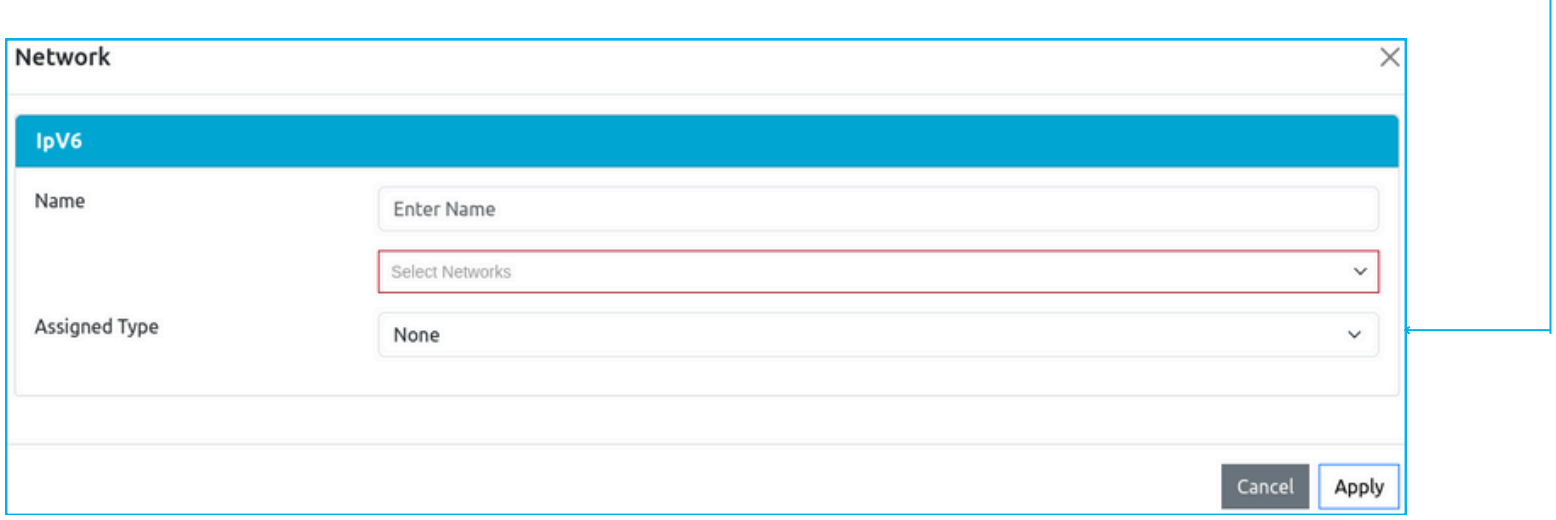
Network - IPv6

Configuration → Network → IPv6

IPv6, or Internet Protocol version 6, is the latest version of the Internet Protocol designed to overcome the limitations of IPv4. It has a much larger address space using 128 bits for addressing (compared to IPv4's 32 bits), simplified header format, improved security with built-in IPsec, automatic address configuration, enhanced multicast and anycastcapabilities, and supports backward compatibility with IPv4. IPv6 is essential for accommodating the growing number of devices on the internet and ensuring its continued development.

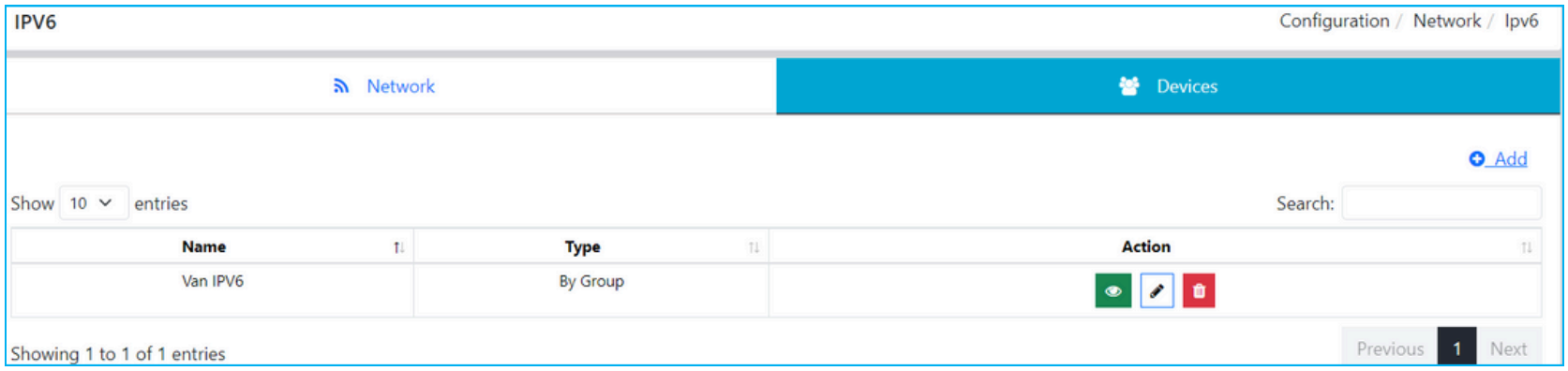


To add IPv6 to any Networks click on Add

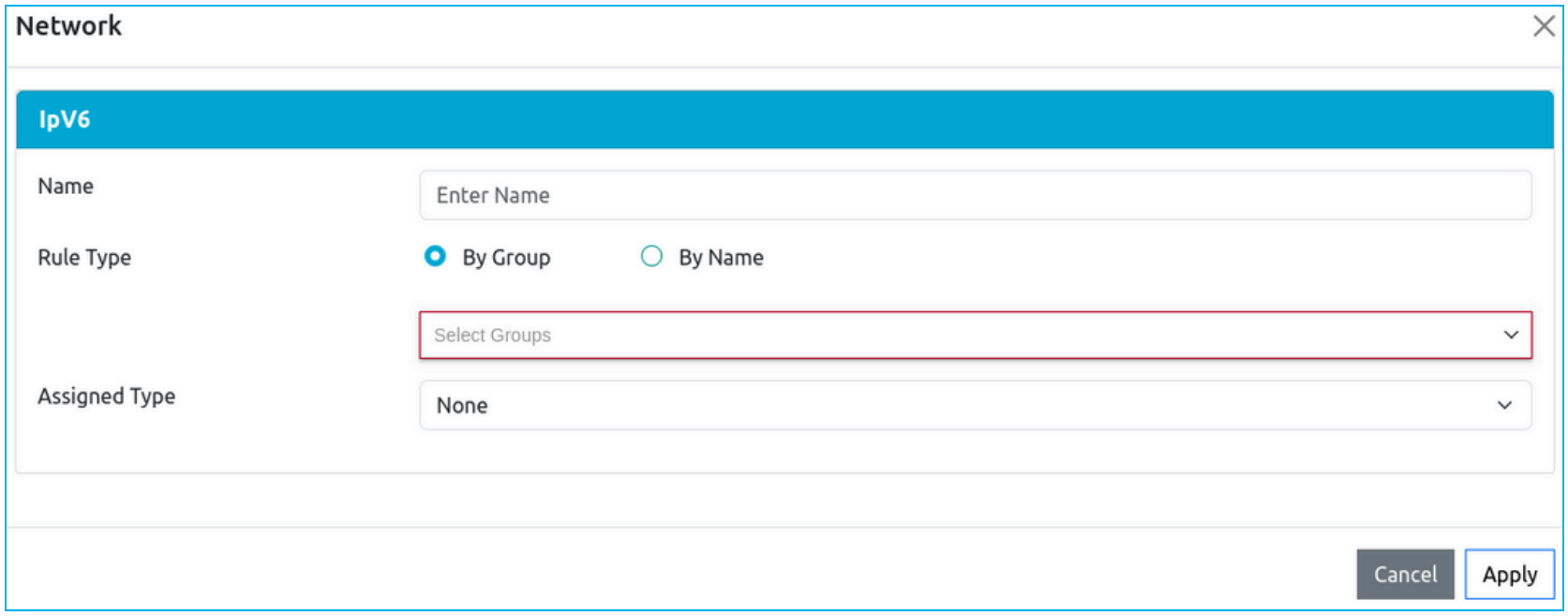


Name: Enter a specific name for identification and select a Network from the dropdown button.

Assigned Type: Choose assigned type from the dropdown button. Options are DHCPv6, SLAAC + Stateless DHCP and SLAAC + RDNS.



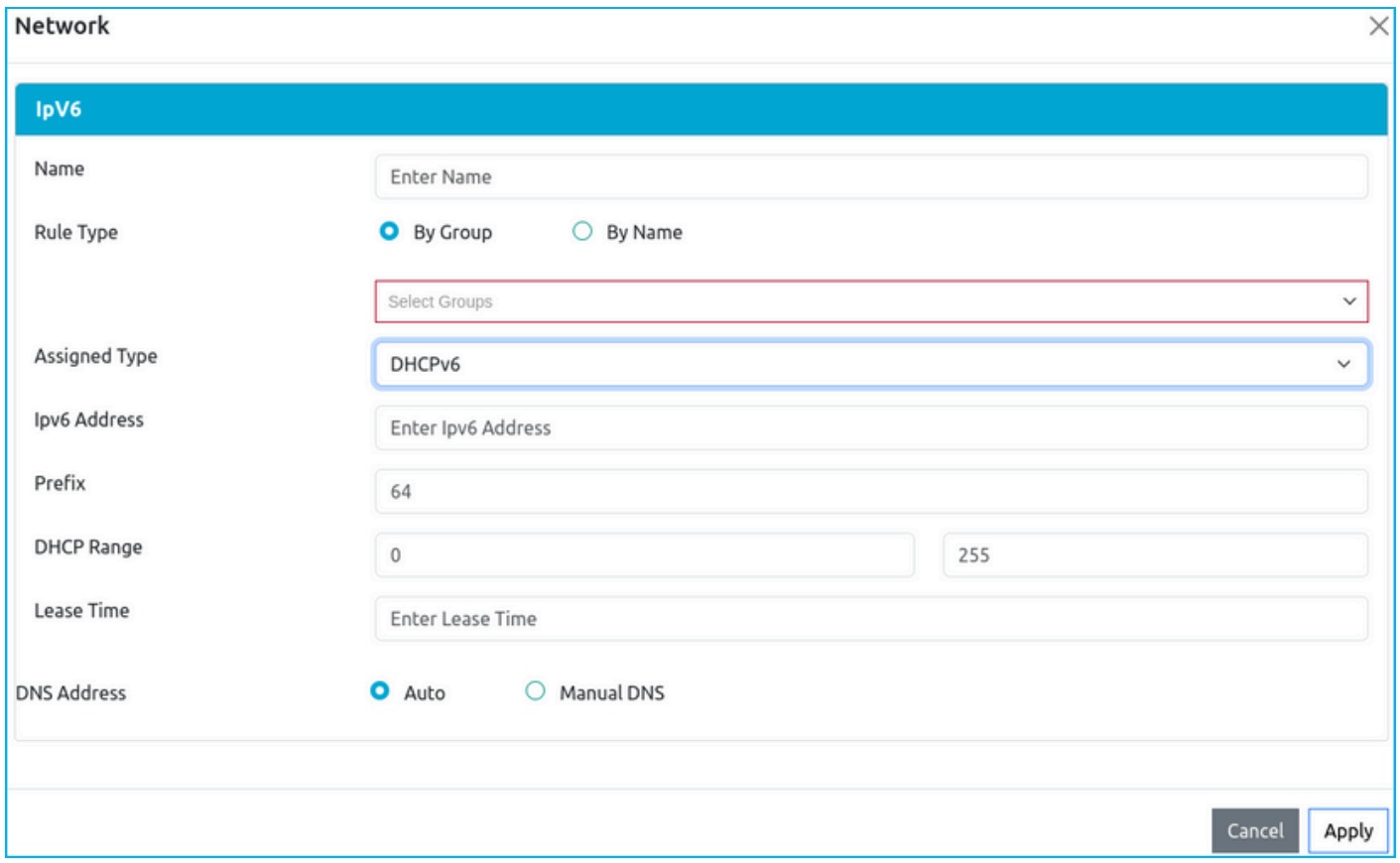
To add IPv6 to any Device click on Add



Name: Enter a specific name for identification

Rule Type: Choose any option and select device or device group to which you want to add IPv6.

Assigned Type: Choose assigned type from the dropdown button. Options are DHCPv6, SLAAC + Stateless DHCP and SLAAC + RDNS.



Assigned Type

DHCPv6: DHCPv6 (Dynamic Host Configuration Protocol for IPv6) automates IPv6 address and network configuration for devices. It provides IPv6 addresses, network parameters, and security features, facilitating efficient network management. DHCPv6 operates in stateful(assigns unique IPv6 addresses) and stateless (provides configuration details without assigning specific addresses) modes, catering to diverse network needs. It also supports prefix delegation for router address assignment. Relay agents assist in DHCPv6 message forwarding, and security mechanisms ensure data integrity and authenticity. Overall, DHCPv6 streamlines IPv6 network setup and administration.

IPv6 address: IPv6 addresses are represented as a sequence of 128 bits, typically written in hexadecimal format and separated into eight groups of 16 bits each, separated by colons. This is known as the colon-hexadecimal format. Here's a general representation of the IPv6 address format:

xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx

Each "x" represents a hexadecimal digit (0-9, A-F). For example, an IPv6 address might look like this:

2001:0db8:85a3:0000:0000:8a2e:0370:7334

Prefix: Prefix refers to an IPv6 address prefix, especially in DHCPv6. DHCPv6 uses prefix delegation to assign blocks of IPv6 addresses to routers, enabling efficient address management within networks. Routers request prefixes from DHCPv6 servers, which then delegate them for address assignment within the network.

Set the Prefix at 64

DHCP Range: The DHCP range, also known as the DHCP address pool, refers to a specific range of IP addresses that a DHCP (Dynamic Host Configuration Protocol) server is configured to assign to devices on a network. When a device connects to the network and requests an IP address using DHCP, the DHCP server selects an available IP address from the DHCP range and assigns it to the device for a specified lease duration.
For example, a typical DHCP range might be defined as:
Starting IP address: 192.168.1.100
Ending IP address: 192.168.1.200

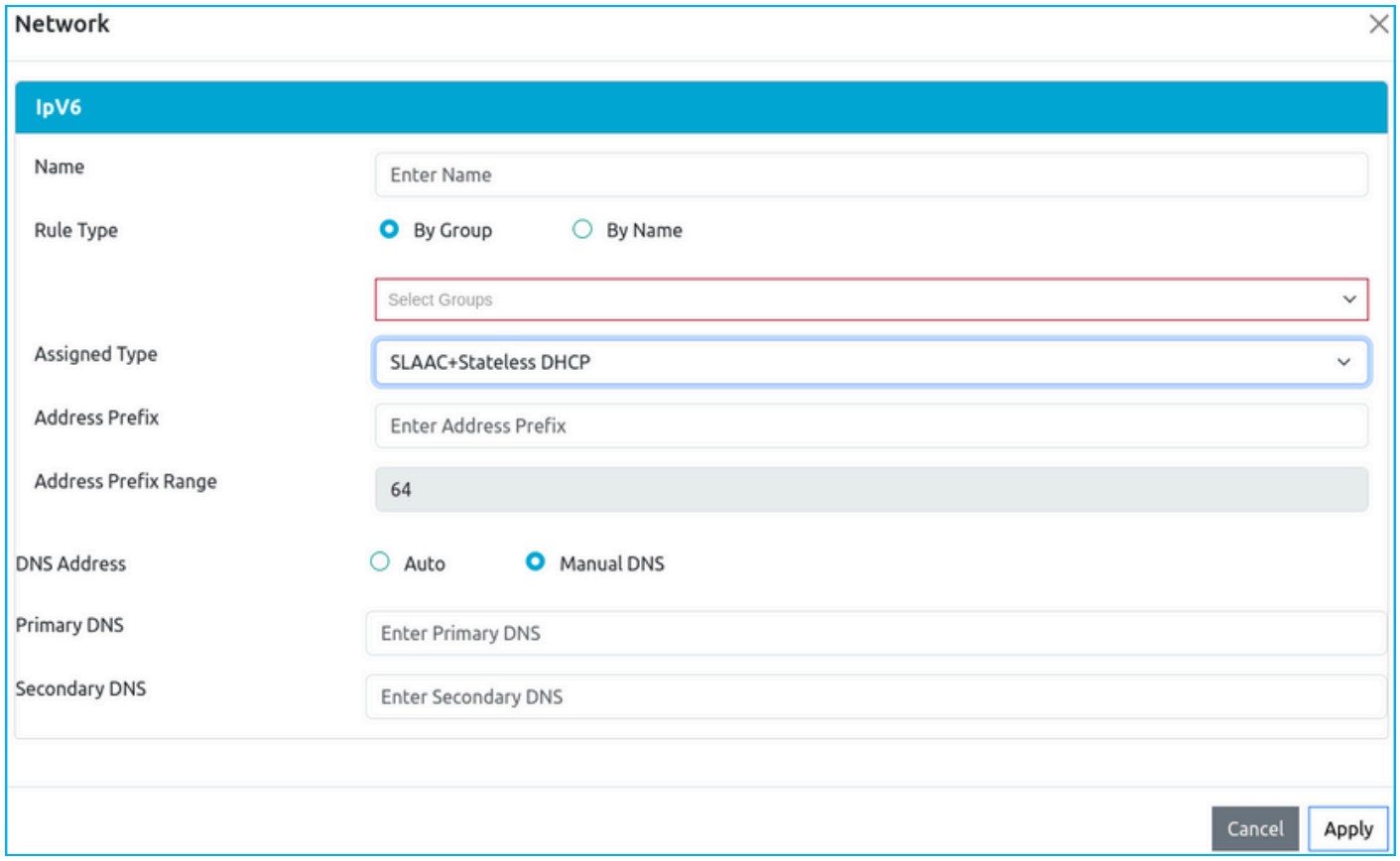
Lease Time: Lease time in DHCP refers to the duration an IP address is temporarily assigned to a device. It's like a 'rental period' for IP addresses, during which the device can use the assigned IP. When the lease time elapses, the device can either renew the lease to keep the same IP or request a new one. The lease time is a crucial aspect of IP address management, allowing flexibility and efficient use of IP addresses in dynamic network environments.

DNS Address: A DNS (Domain Name System) address, often referred to as a DNS server address, is the network address of a server that hosts a DNS service. The DNS system translates user-friendly domain names (e.g., www.example.com) into IP addresses (e.g., 192.168.1.1) that computers and network devices use to communicate over the internet. There are two types of DNS addresses:

Primary DNS Server Address: The address of the primary DNS server that the device will use to resolve domain names into IP addresses. This server is the first choice for DNS resolution.

Secondary DNS Server Address: An alternative DNS server address that the device will use if the primary DNS server is unavailable or does not respond. Having a secondary DNS server provides redundancy and ensures continued DNS resolution even if the primary server is down.

Here you can choose either Auto or Manual DNS. If you choose Manual DNS then you have to put the address manually.



Assigned Type:-

SLAAC + Stateless DHCP: SLAAC (Stateless Address Autoconfiguration) and Stateless DHCP (Dynamic Host Configuration Protocol) are used in combination to achieve comprehensive network configuration in IPv6 environments. This hybrid approach combines the benefits of both SLAAC and Stateless DHCP, providing devices with not only IPv6 addresses but also additional network configuration parameters. Here's how SLAAC and Stateless DHCP can work together:

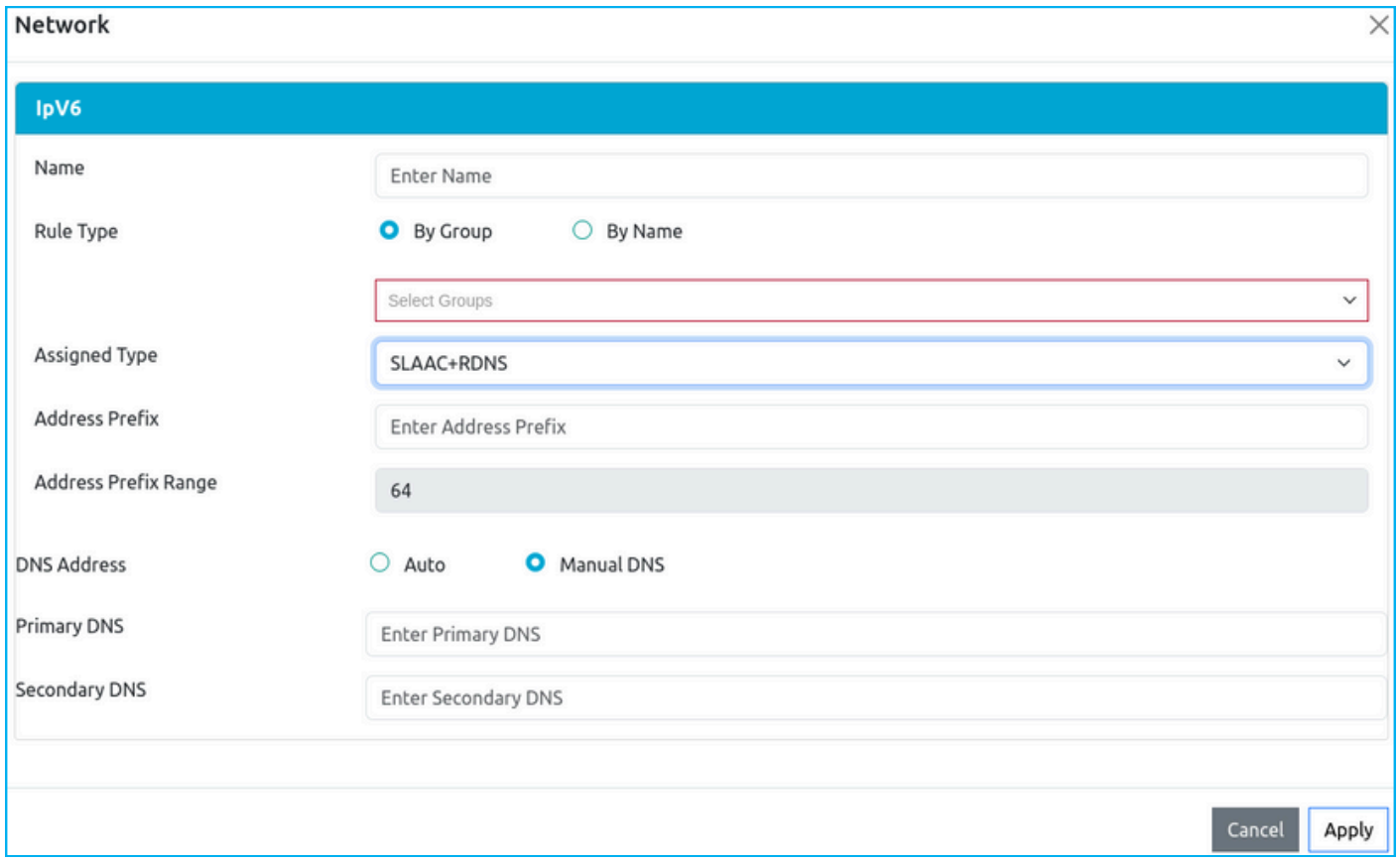
SLAAC for Address Assignment:

Devices use SLAAC to autonomously generate IPv6 addresses based on the network prefix advertised by IPv6 routers via Router Advertisement (RA) messages. The interface identifier part of the address is typically derived from the device's MAC address.

Stateless DHCP for Additional Configuration Parameters:

While SLAAC handles address assignment, Stateless DHCP can be used to provide additional network configuration parameters such as DNS server addresses, domain names, NTP (Network Time Protocol) servers, and other relevant details.

Note: For rest of the fields refer to page no. 49 and 50.



Assigned Type:-

SLAAC + RDNS: When a device uses SLAAC to configure its IPv6 address, it generates the interface identifier portion of the address (usually based on its MAC address).

An organization can set up their DNS servers to automatically create reverse DNS records (PTR records) mapping these IPv6 addresses to corresponding hostnames.

This allows for efficient reverse lookups where given an IPv6 address, you can determine the associated hostname

SLAAC:

Devices use SLAAC to autonomously generate IPv6 addresses based on the network prefix advertised by IPv6 routers via Router Advertisement (RA) messages. The interface identifier part of the address is typically derived from the device's MAC address.

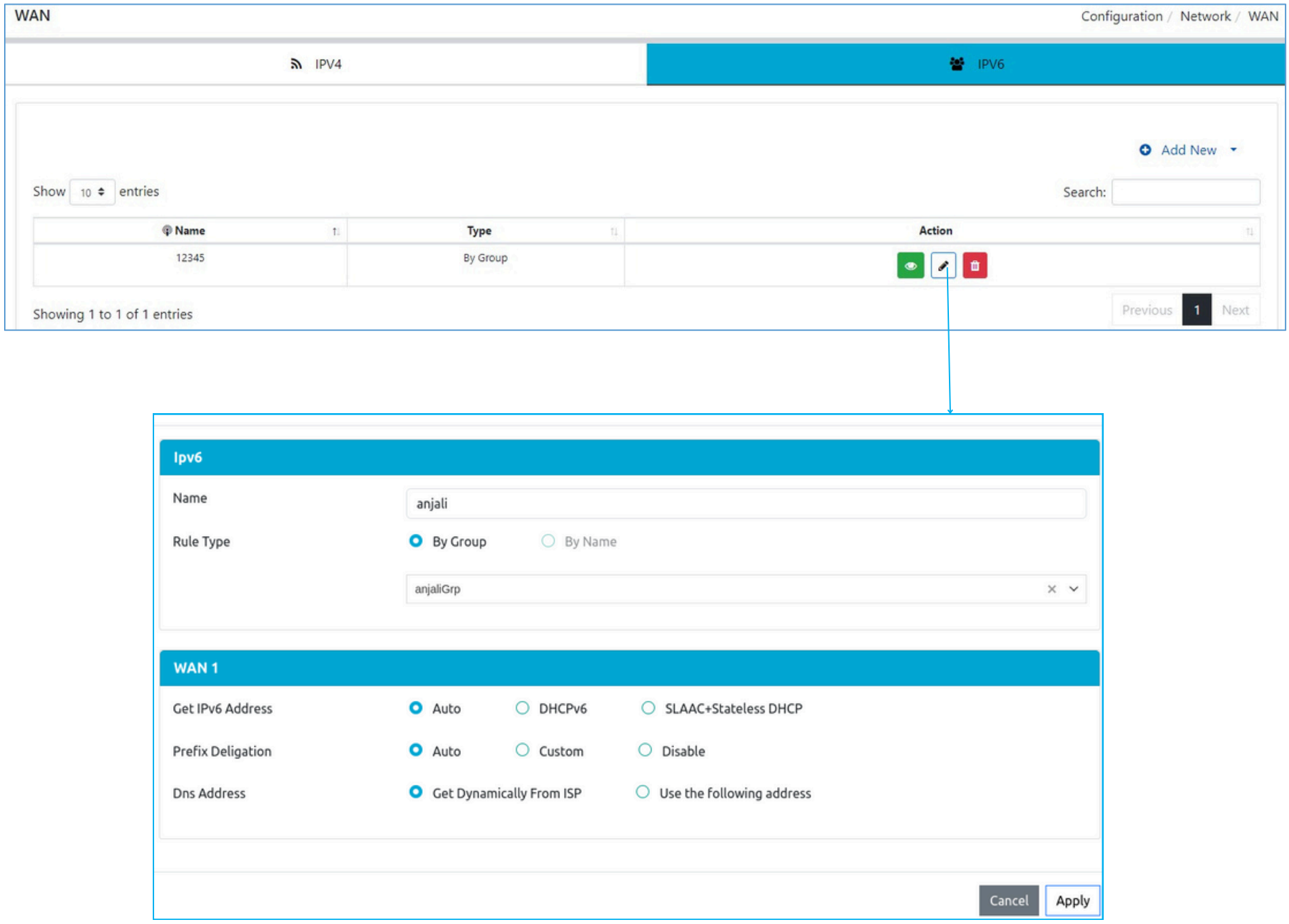
RDNS:

RDNS is the process of converting an IP address back into a domain name, providing a way to look up the domain associated with an IP address. It's a crucial part of network infrastructure, often used for troubleshooting, logging, and security purposes. RDNS helps identify the hostnames corresponding to IP addresses.

Note: For rest of the fields refer to page no. 49 and 50.

Network - WAN

Configuration → Network → WAN → IPv6

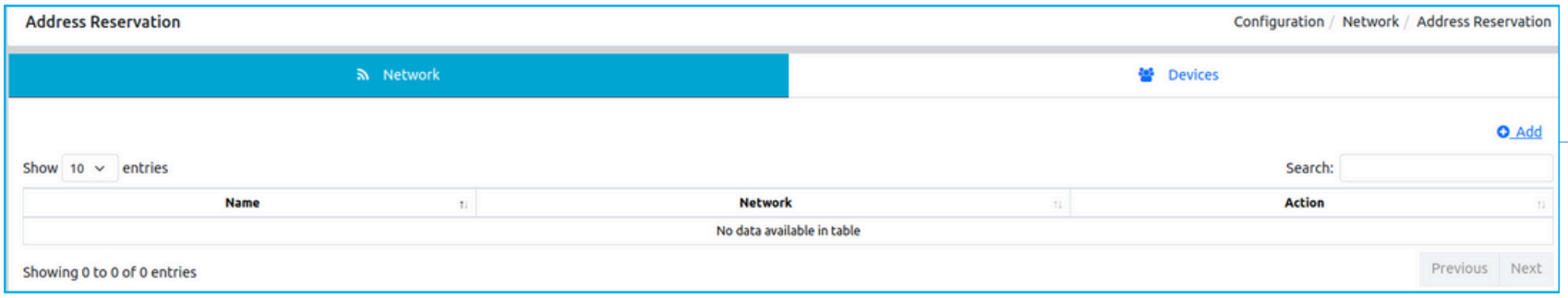


Name: Enter a specific name for identification.
Rule type: Select either By Group or By Name. And choose Device group if you selected rule type as By Group or Device name if you selected rule type as By Name.

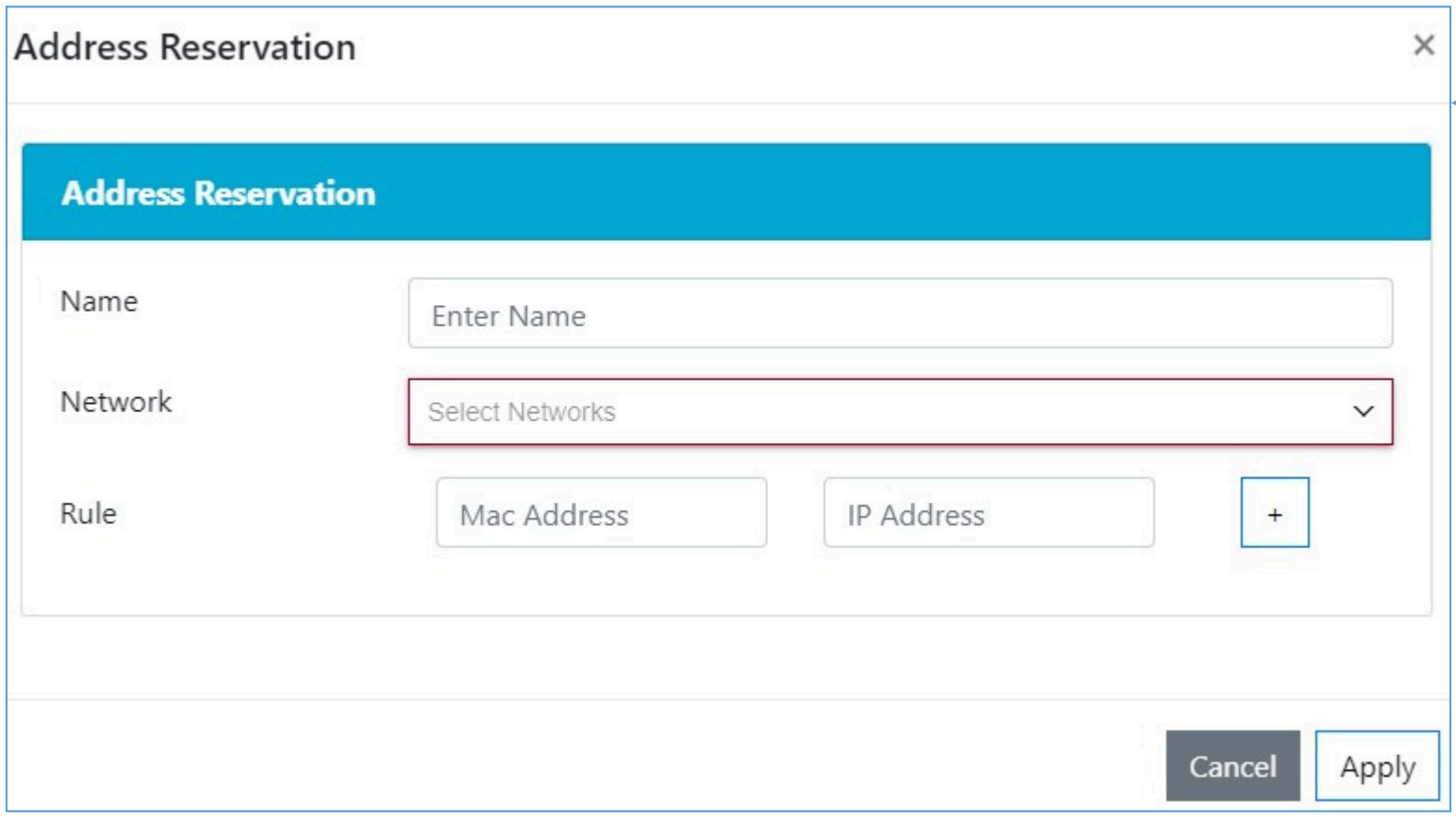
Note: For rest of the fields refer to page no. 49 and 50.

Network - Address Reservation

Configuration → Network → Address Reservation → Network



Address Reservation: Address reservation, also known as DHCP reservation, is a feature in DHCP (Dynamic Host Configuration Protocol) where the DHCP server allocates a specific IP address to a device based on its MAC (Media Access Control) address. This ensures that the device consistently receives the same IP address whenever it connects to the network.

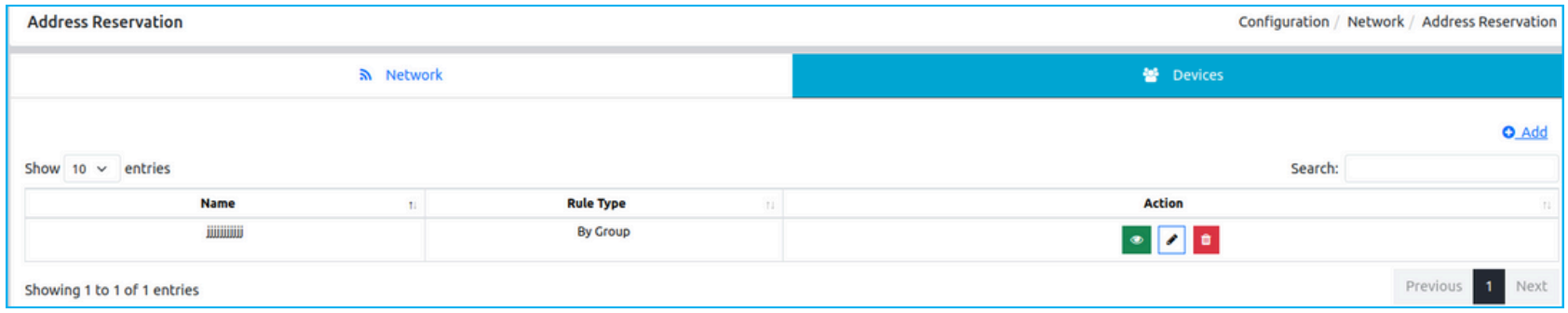


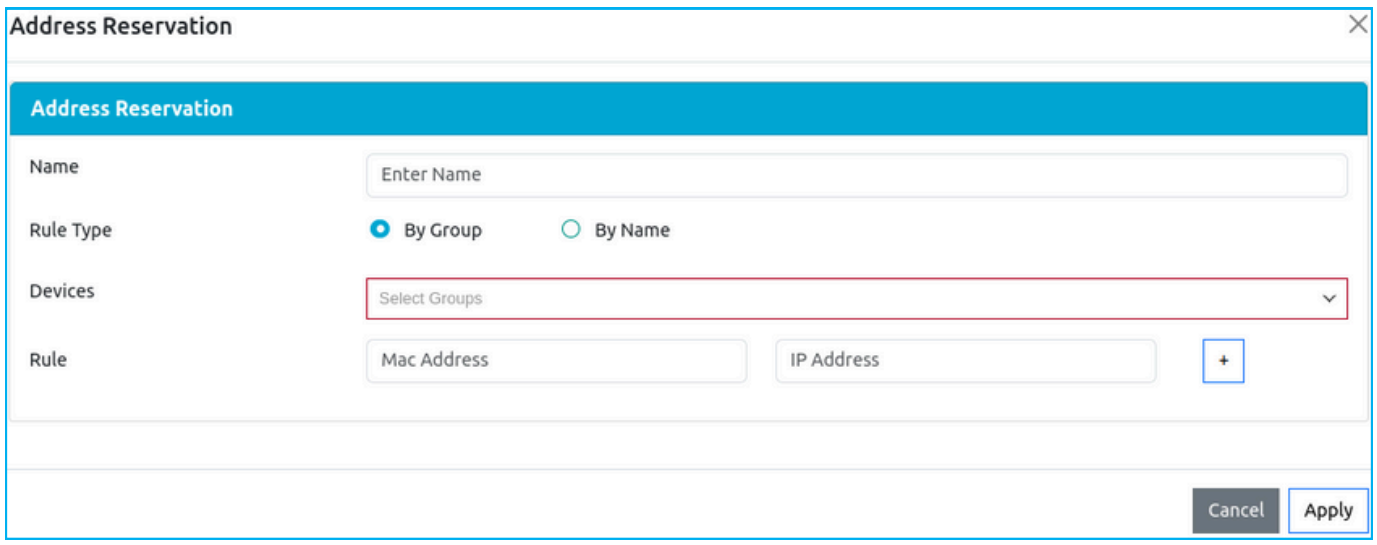
Name: Enter a specific name for identification.

Network: Select network from the dropdown button.

Rule: Input your MAC Address and IP Address. Here you can input multiple MAC and IP Addresses by clicking on +

Configuration → Network → Address Reservation → Devices





Name: Enter a specific name for identification.

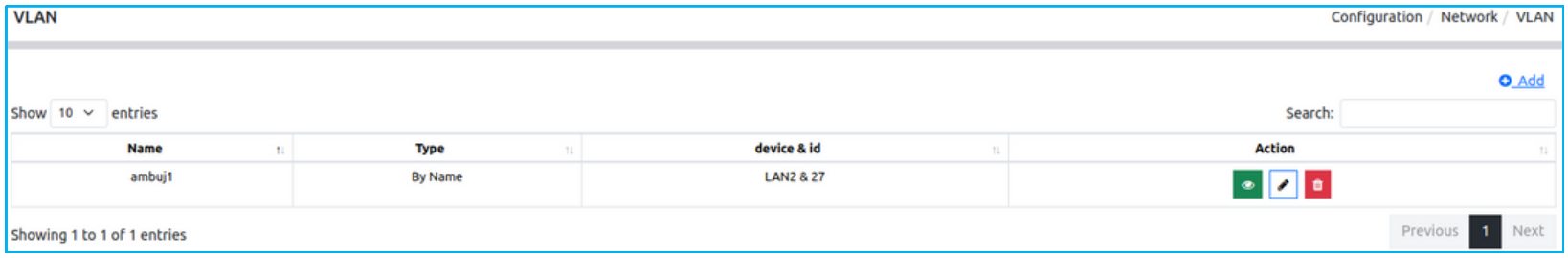
Rule Type: Set Rule type as per your requirement.

Devices: Select device group if you set the rule type as By Group or device name if yor set the rule type as By Name from the dropdown button.

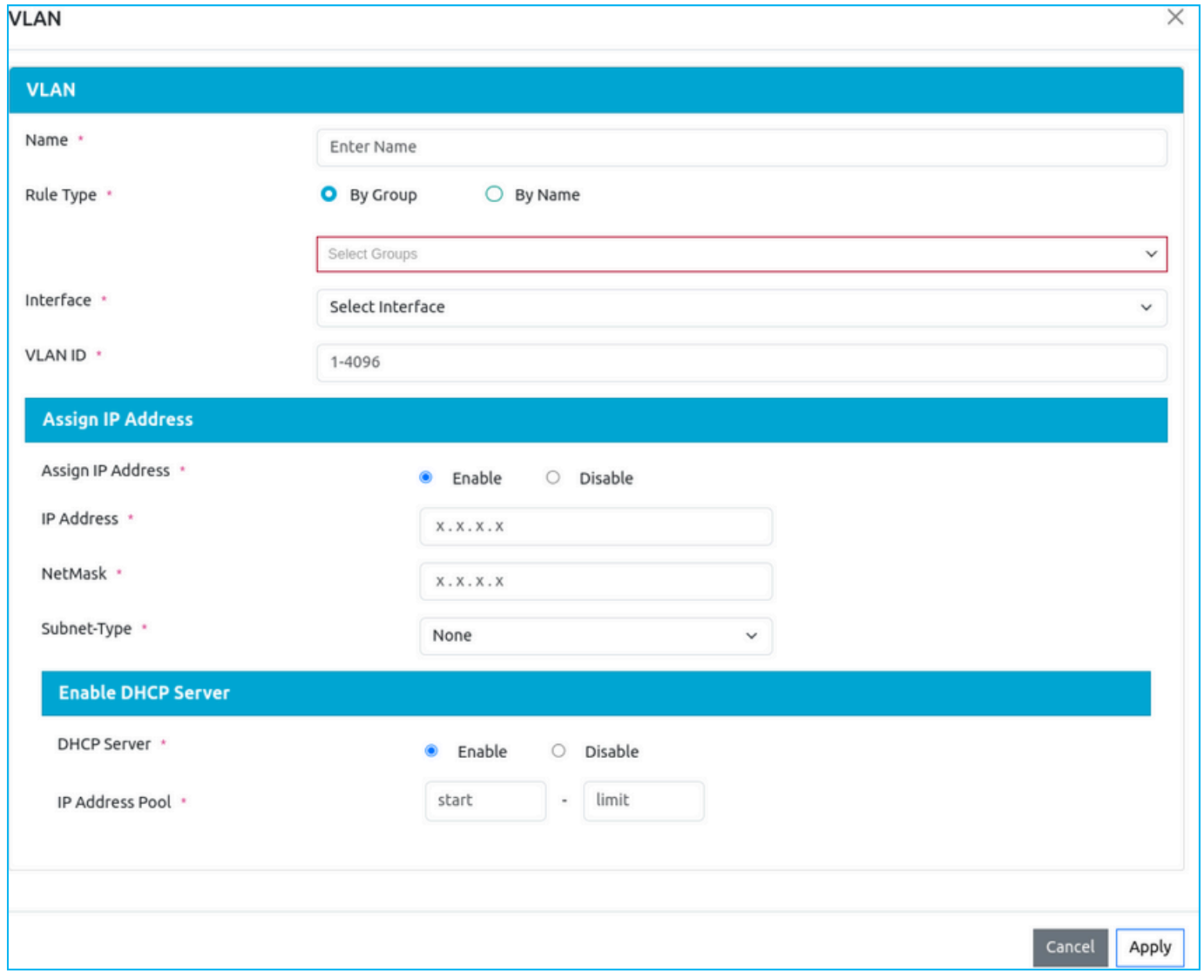
Rule: Input your MAC Address and IP Address. Here you can input multiple MAC and IP Addresses by clicking on

Network - VLAN

Configuration → Network → VLAN



VLANs allow you to segment a network into smaller, virtual sub-networks, which can be used to isolate traffic and improve network performance. VLANs are often used in enterprise networks to separate different departments or groups, or to segment different types of traffic (such as voice, data, and video).



VPN - PPTP

Configuration → VPN → PPTP

PPTP (Point-to-Point Tunneling Protocol) is a networking protocol that was commonly used to establish virtual private network (VPN) connections over the internet or other untrusted networks.It's important to note that PPTP has some security vulnerabilities, and it's generally considered less secure than more modern VPN protocols like L2TP/IPsec, OpenVPN, or IKEv2/IPsec.

Some key points about PPTP:

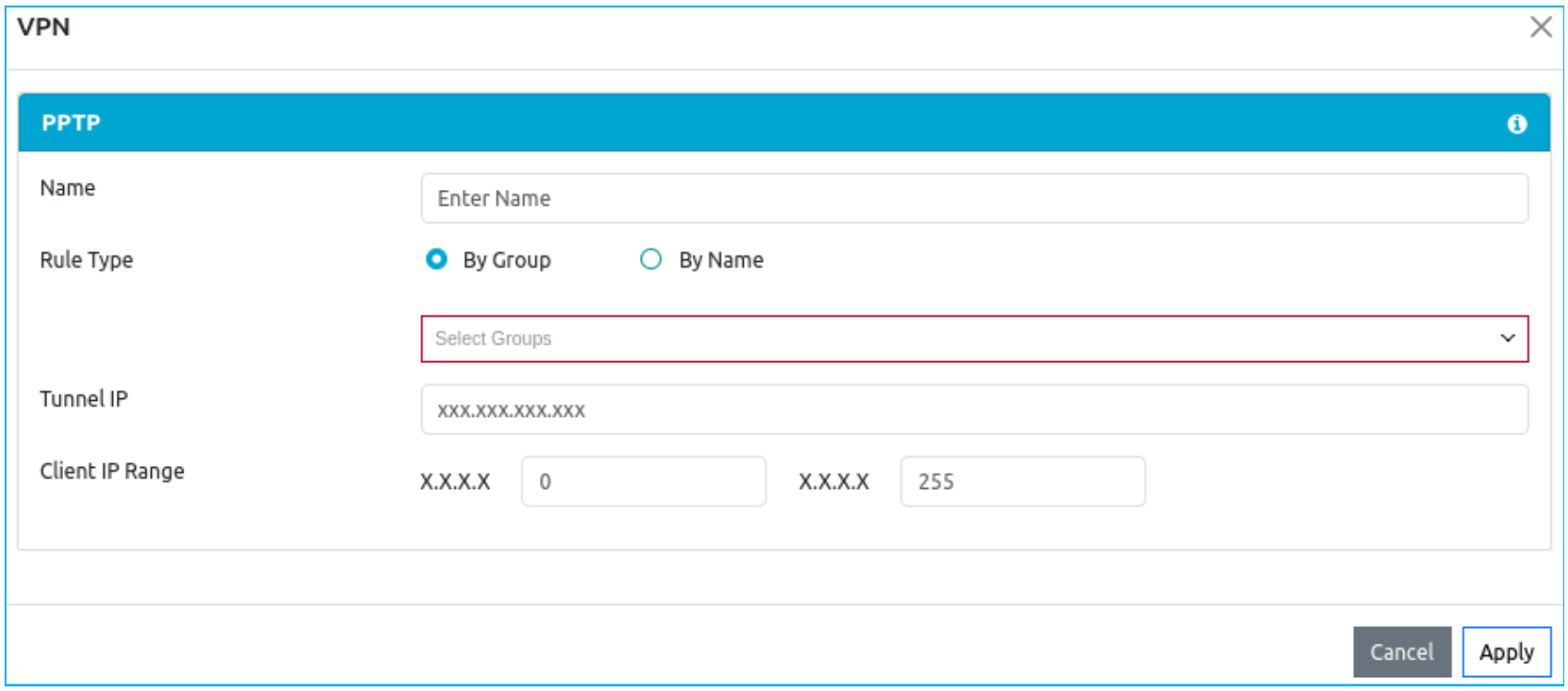
Security: VPNs provide a secure and encrypted connection, ensuring that data transmitted between the remote location and the cloud infrastructure is protected from unauthorized access.

Access Control: VPNs enable organizations to control who has access to their cloud resources, ensuring that only authorized users or networks can connect.

Privacy: VPNs help maintain the privacy of data as it traverses public networks, making it difficult for eavesdroppers to intercept sensitive information.

Connectivity: VPNs enable seamless and secure connectivity to cloud resources, regardless of the physical location of the user or network.

Configuration → VPN → PPTP → New



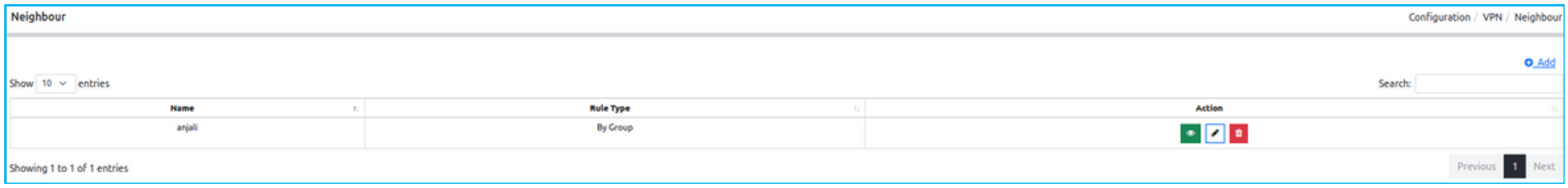
Tunnel IP: It is an encrypted connection between a device and a VPN server that hides a user's IP address and encrypts their data.

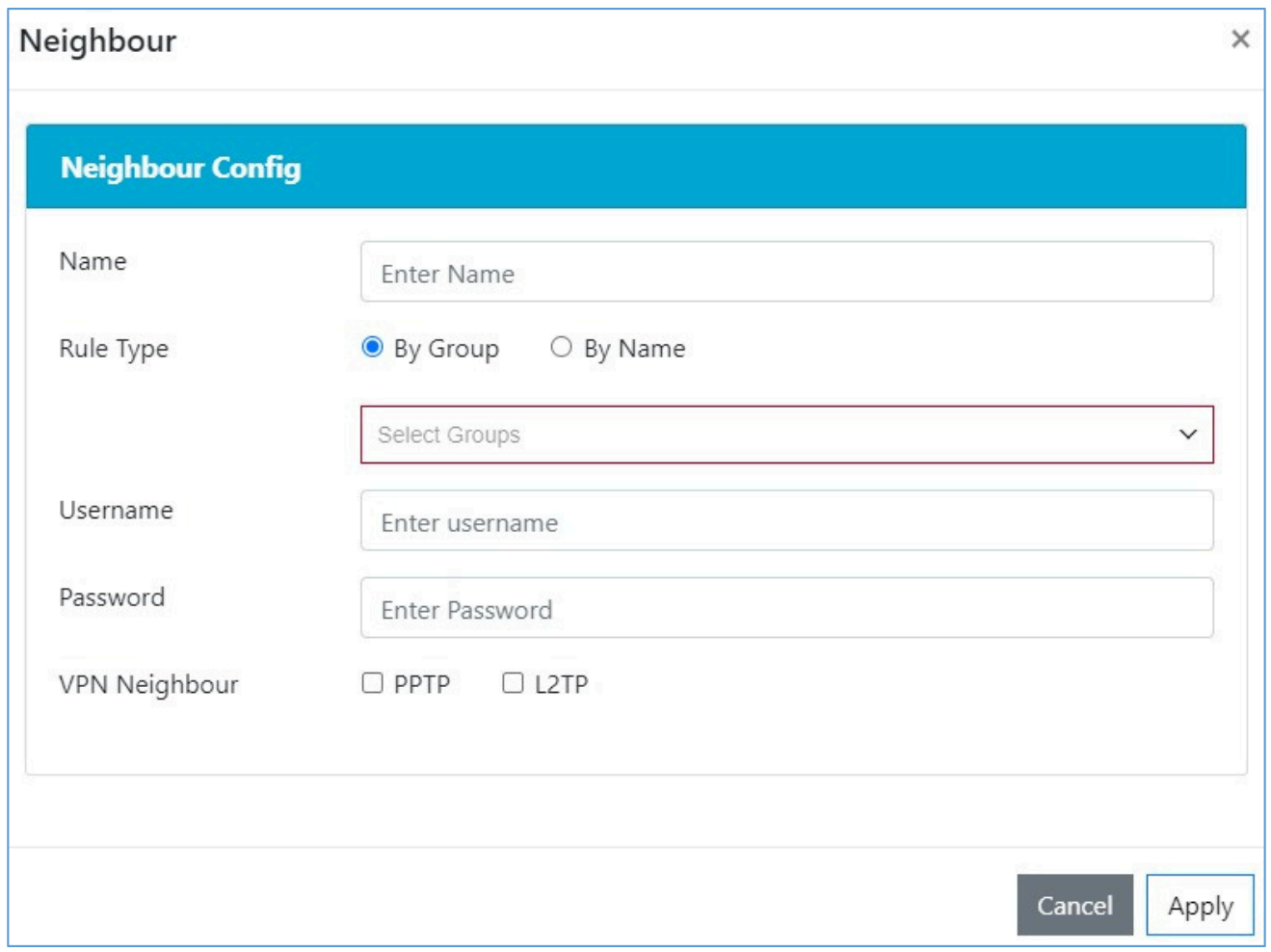
Client IP Range: The client IP range refers to the range of IP addresses that the VPN server assigns to connected clients when they establish a VPN connection. When you connects to the PPTP VPN server, The server assigns an IP address from the specified client IP range to you. This IP address is used for the duration of the VPN session.

VPN - Neighbour

Configuration → VPN → Neighbor

The Neighbor is a remote network or device that connects to the PPTP server/ L2TP server. using a username and a password for authentication. The PPTP Neighbor is essentially a user or client trying to establish a secure tunnel to the PPTP server/ L2TP server, and theirusername and password are used to Authenticate and gain access to the VPN.



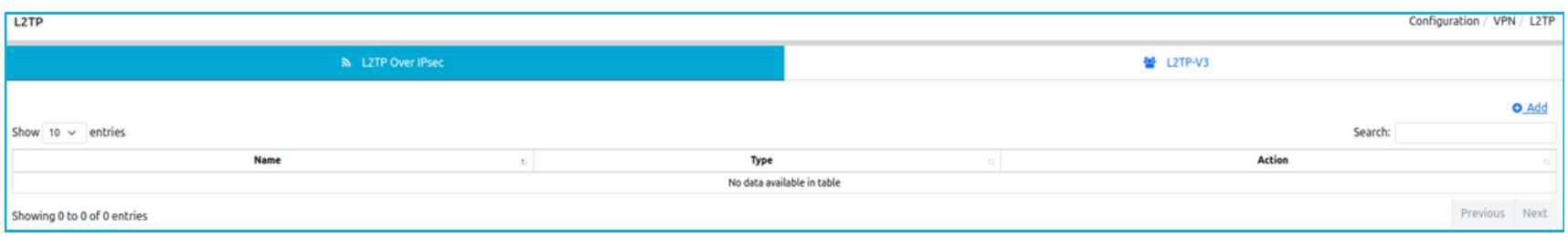


VPN Neighbor: If you enable PPTP, you have to use the same username and password that you set in the PPTP VPN. If you enable both PPTP and L2TP, you must use the usernames and passwords that are set for both the PPTP and L2TP VPNs.

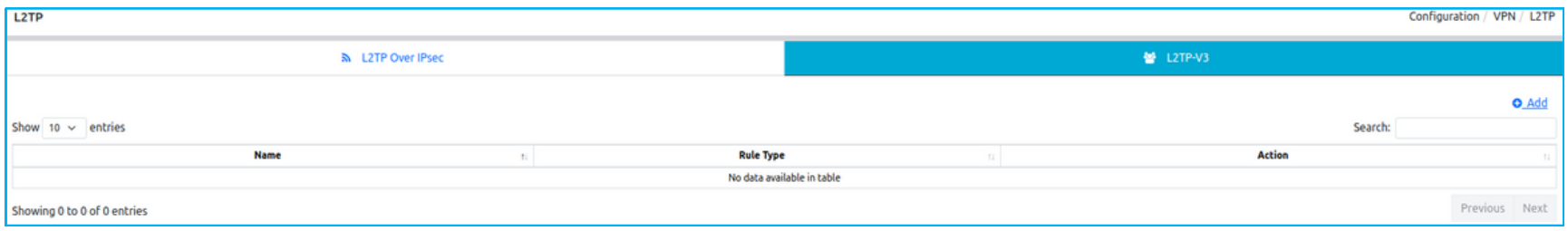
VPN - L2TP

Configuration → VPN → L2tp

L2TP (Layer 2 Tunneling Protocol) is a networking protocol used for creating secure virtual private network (VPN) connections. It's often combined with IPsec for added security. L2TP is known for its compatibility, support for various operating systems, and flexibility in traversing different network configurations. It's commonly used in remote access, site-to-site, and mobile VPN scenarios. However, its security relies on the additional use of IPsec, and more modern VPN protocols are often preferred for their enhanced securityfeatures.

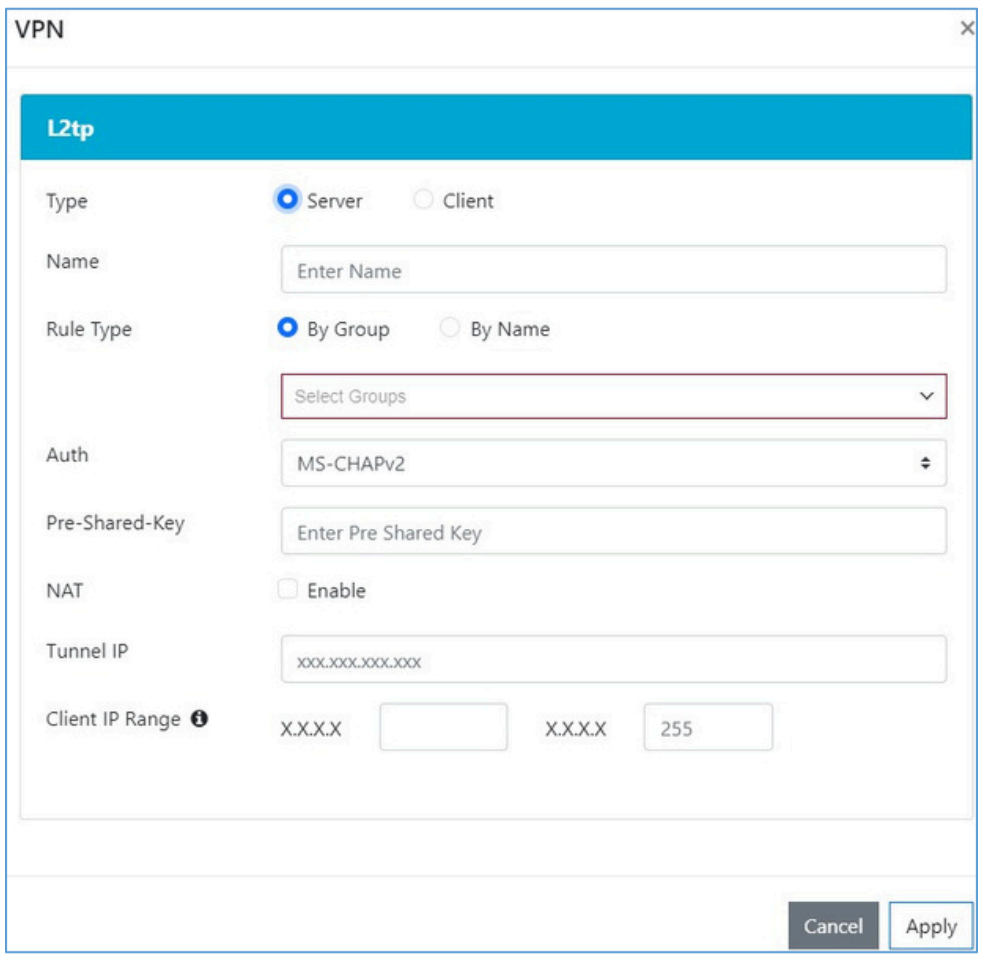


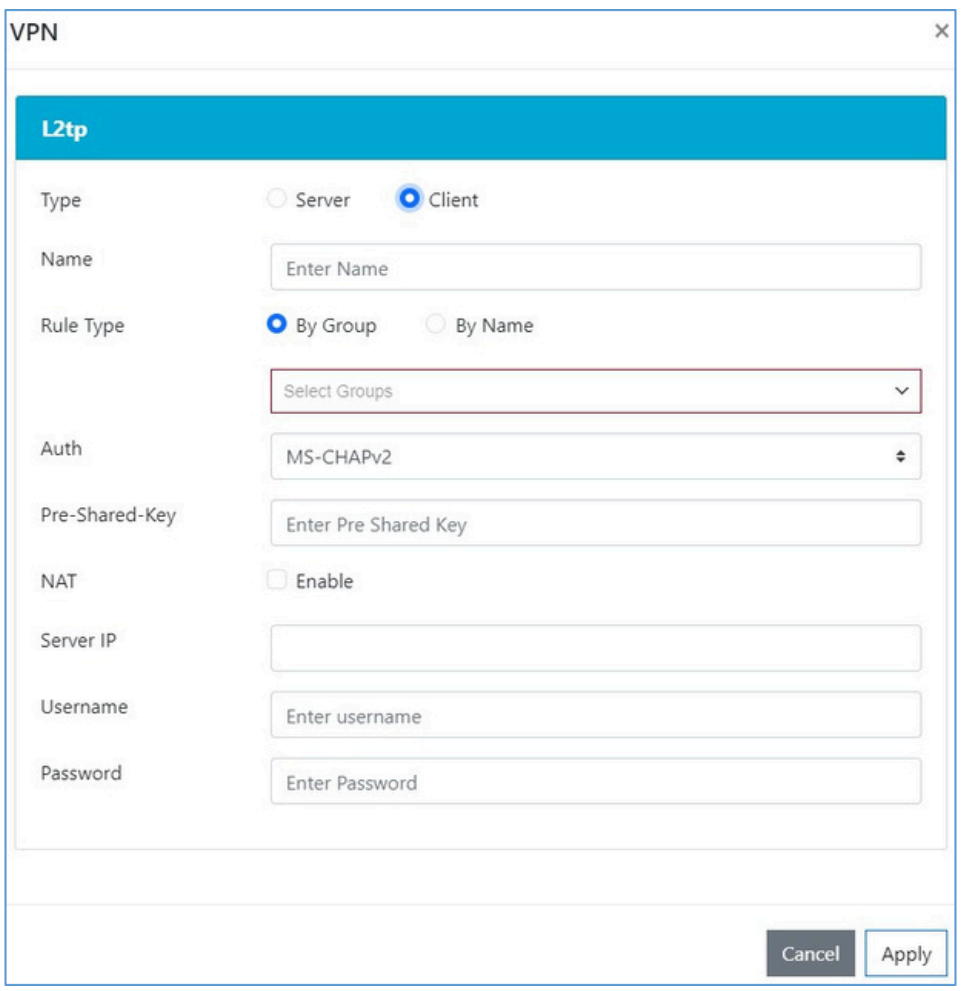
L2TP/Ipsec: L2TP/IPsec, or Layer 2 Tunneling Protocol over Internet Protocol Security, is a combination of two networking protocols used to establish secure virtual private network (VPN) connections. This combination provides a higher level of security compared to using L2TP or IPsec individually.



L2TPv3: L2TPv3 (Layer Two Tunneling Protocol Version 3) is a point-to-point layer two over IP tunnel. This means you can tunnel L2 protocols like Ethernet, Frame-relay, ATM, HDLC, PPP, etc. over an IP network. This can be pretty useful…For example, let's say you have two remote sites and an application that requires that hosts are on the same subnet. With L2TPv3, it's no problem to "bridge" two remote sites together,putting them in the same broadcast domain/subnet.

Configuration → VPN → L2tp → Add





Auth: Authtypically refers to the authentication mechanism used to verify the identity of users or devices attempting to establish a VPN (Virtual Private Network) connection. L2TP is often used in conjunction with other authentication protocols to secure VPN connections. The four authentication methods used with L2TP are: PAP, CHAP, MS-CHAP and MS-CHAPv2

PAP (Password Authentication Protocol):PAP is a simple authentication protocol that requires the client (the device or user trying to connect to the VPN) to send a username and password to the server (the VPN endpoint) in plain text. The server then compares the provided credentials with its database to authenticate the client. PAP is considered less secure because it transmits passwords in plain text, making it vulnerable to eavesdropping.

CHAP (Challenge Handshake Authentication Protocol): CHAP is a more secure authentication method used with L2TP. It involves a challenge-response mechanism where the server sends a random challenge to the client. The client then uses a one-way hash function to combine the challenge and its password, sending the result back to the server for verification. Since the password is never sent in plain text, CHAP provides a higher level of security compared to PAP.

MS-CHAP: MS-CHAP (Microsoft Challenge Handshake Authentication Protocol) is a widely used authentication protocol in the context of VPN connections and remote access authentication. It is developed by Microsoft and is an extension of the standard CHAP (Challenge Handshake Authentication Protocol). MS-CHAP enhances CHAP with additional security features and compatibility with Microsoft Windows-based systems.

MS-CHAPv2:MS-CHAPv2(Microsoft Challenge Handshake Authentication Protocol version 2) is also an authentication protocol used primarily in VPN and remote access scenarios. It was also developed by Microsoft to address security concerns and improve upon the earlier version, MS-CHAPv1. MS-CHAPv2 is designed to provide stronger security and protection against certain vulnerabilities.

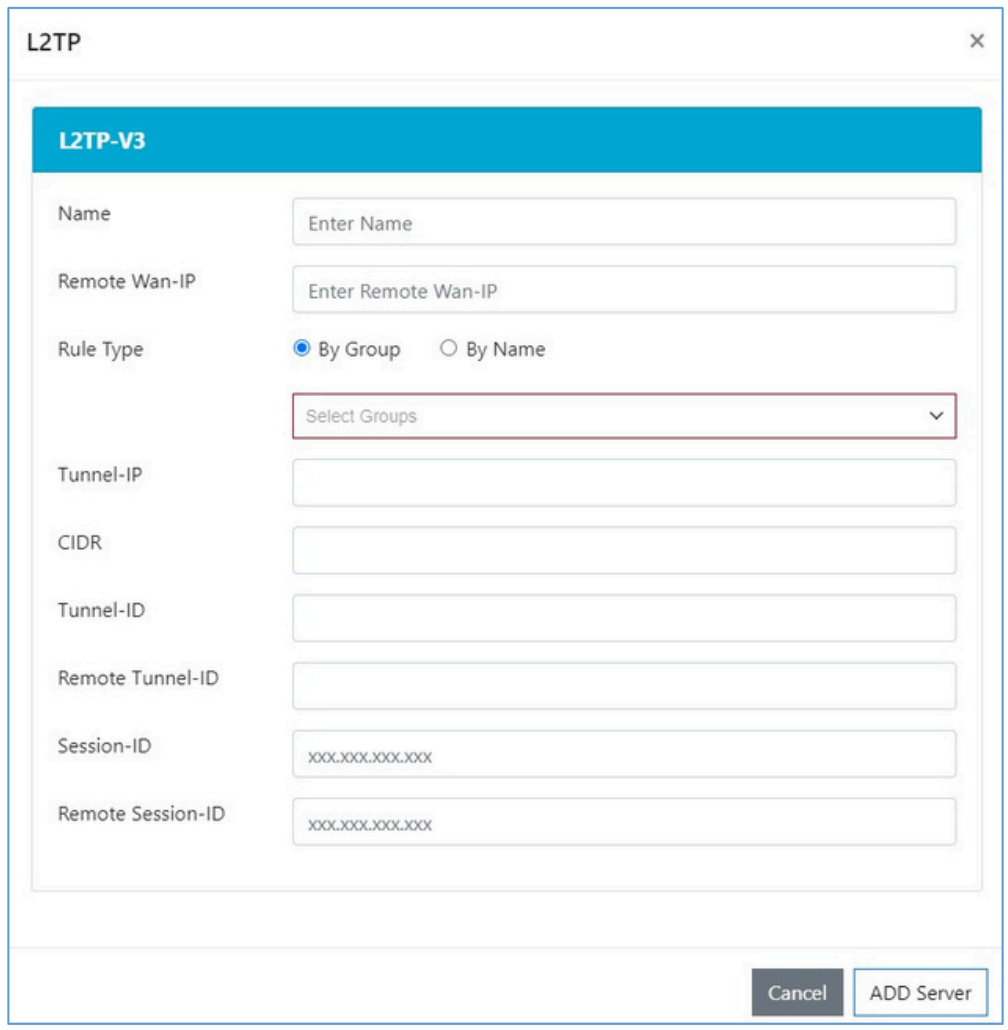
Pre-Shared Key: Apre-shared key (PSK) is a shared secret phrase or string of characters used to authenticate and secure the VPN connection. The PSK is known to both the client and the VPN server, allowing them to establish a secure communication channel.

NAT: NAT is a technique used to map private IP addresses to a single public IP address, typically used in routers and firewalls to allow multiple devices within a local network to share a single public IP address when accessing resources on the internet.

NAT for L2TP Servers: In some cases, L2TP servers may be behind a NAT device, such as a router or firewall. This scenario is common when you have a private network with L2TP VPN servers, and you want to allow remote clients to connect to them from the internet. The NAT device maps the public IP address and port number to the internal private IP address of the L2TP server.

For L2tp neighbour refer to page number 59.

Configuration → VPN → L2tpv3 → Add New



Remote Wan-IP: You need to configure the WAN IP address of remote router or device that is going to establish the L2TPv3 tunnel. This IP address is used to identify the endpoint of the tunnel.

Tunnel-IP: In L2TPv3 tunnels, each endpoint of the tunnel is identified by its own tunnel IP address. L2TPv3 is used to transport Layer 2 frames over an IP network. Example: Tunnel IP at Local Endpoint: 192.168.1.1

CIDR: CIDR (Classless Inter-Domain Routing) is a method for representing IP addresses and network prefixes. It uses a notation that includes an IP address followed by a forward slash and a number (e.g., 192.168.1.0/24). This number indicates the length of the network prefix, allowing for more flexible and efficient allocation of IP address blocks compared to the older classful IP addressing scheme. CIDR is widely used in networking for specifying network addresses and routing policies.

Tunnel-ID and Remote Tunnel-ID: In L2TPv3 (Layer 2 Tunneling Protocol Version 3), tunnel IDs are used to uniquely identify and manage virtual tunnels. Each L2TPv3 tunnel has both a local and remote tunnel ID. These IDs are configured during tunnel setup and negotiation,ensuring that data frames are properly routed through the tunnel. Tunnel IDs play a crucial role in differentiating and directing traffic withinL2TPv3 tunnels, especially in networks with multiple tunnels.

Note: The ID must be unique.

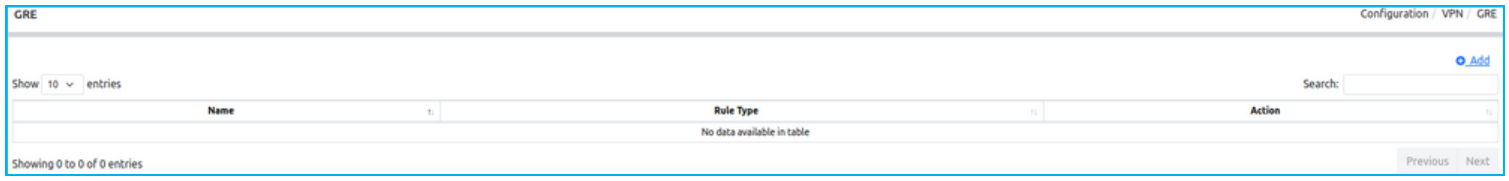
Session ID: ASession ID is a unique identifier used to distinguish and manage individual data sessions. It ensures that data frames are correctly routed to the appropriate session within the tunnel, allowing multiple sessions to share the same tunnel without interference. Session IDs are assigned during session setup and negotiation between the local and remote endpoints and play akey role in multiplexing data sessions.

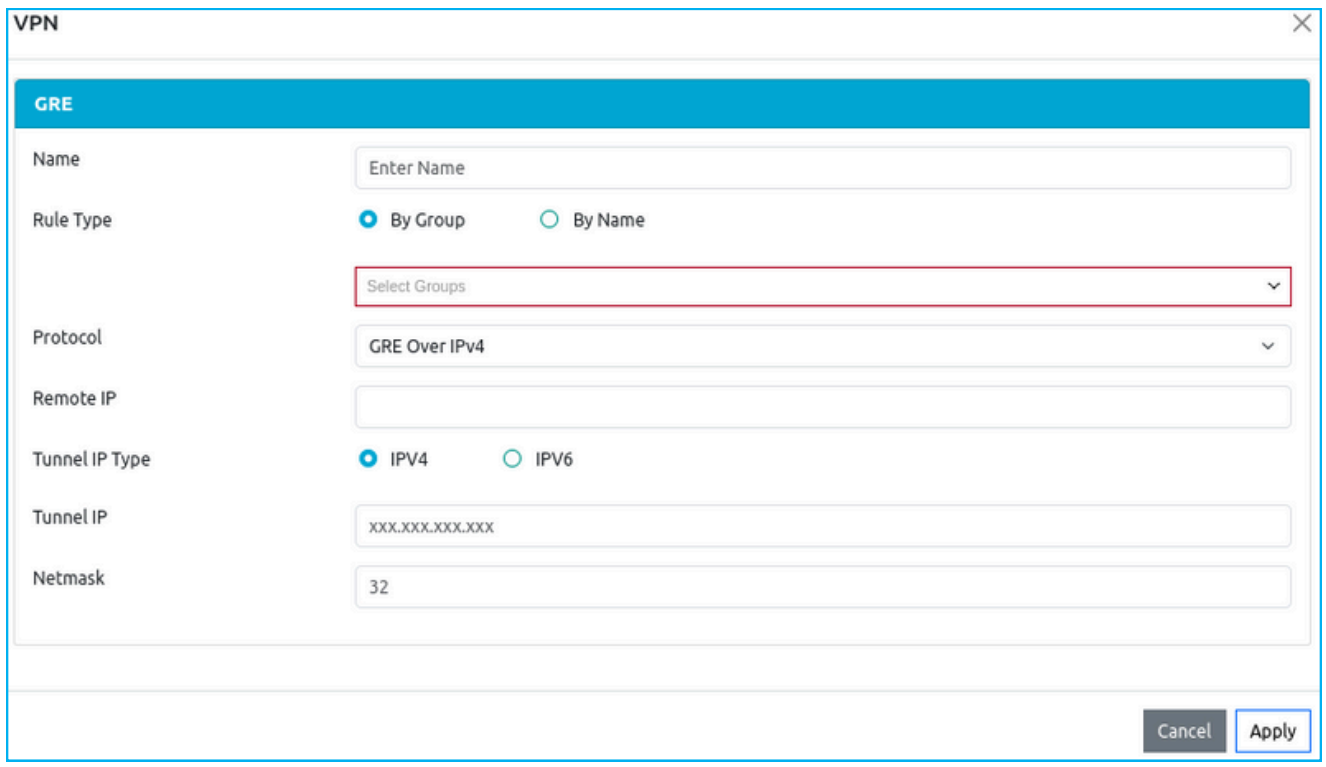
Remote Session ID: In L2TPv3 (Layer 2 Tunneling Protocol Version 3), the "remote session ID" refers to the session identifier assigned to the remote end of an individual data session. The remote session ID is used in conjunction with the local session ID to uniquely identify and manage data sessions within the tunnel.

VPN - GRE

Configuration → VPN → GRE

GRE: GRE (Generic Routing Encapsulation) is used to create a point-to-point or site-to-site virtual network connection over an existing network, typically the internet. GRE itself does not provide encryption or security features, so it is often used in conjunctionwith other protocols such as IPsec (Internet Protocol Security) to create secure VPN connections.





GRE over IPv4

- The original IP packet is encapsulated by adding a GRE header followed by a new IPv4 header.
- The GRE header contains control information and protocol type.
- The new IPv4 header has the source and destination addresses of the GRE tunnel endpoints.
- The encapsulated packet is then transmitted over the IPv4 network.
- At the receiving end, the GRE and new IPv4 headers are removed, leaving the original IP packet, which is then forwarded to its final destination based on the original IP header.
- GRE doesn't provide encryption or security, often requiring additional security protocols like IPsec for secure communication.

GRE over IPv4

GRE can be used over IPv6 to create private point-to-point connections. The process is similar to GRE over IPv4, but encapsulation occurs within IPv6 packets. The original IP packet is encapsulated with a GRE header and a new IPv6 header. The GRE header contains controlinformation, and the new IPv6 header has the source and destination IPv6 addresses of the tunnel endpoints. The encapsulated packet is transmitted over the IPv6 network and, upon reaching the endpoint, is decapsulatedfor further processing. As with GRE over IPv4, GRE over IPv6 doesn't provide encryption or security, often requiring additional security protocols like IPsec for secure communication.

GRE Tap over IPv4

When utilizing GRE (Generic Routing Encapsulation) over IPv4, you can create a virtual point-to-point network interface, commonly referred to as a "GRE tap," that allows for encapsulation and tunneling of various network protocols. This setup enables the creation of private communication channels over a public IPv4 network

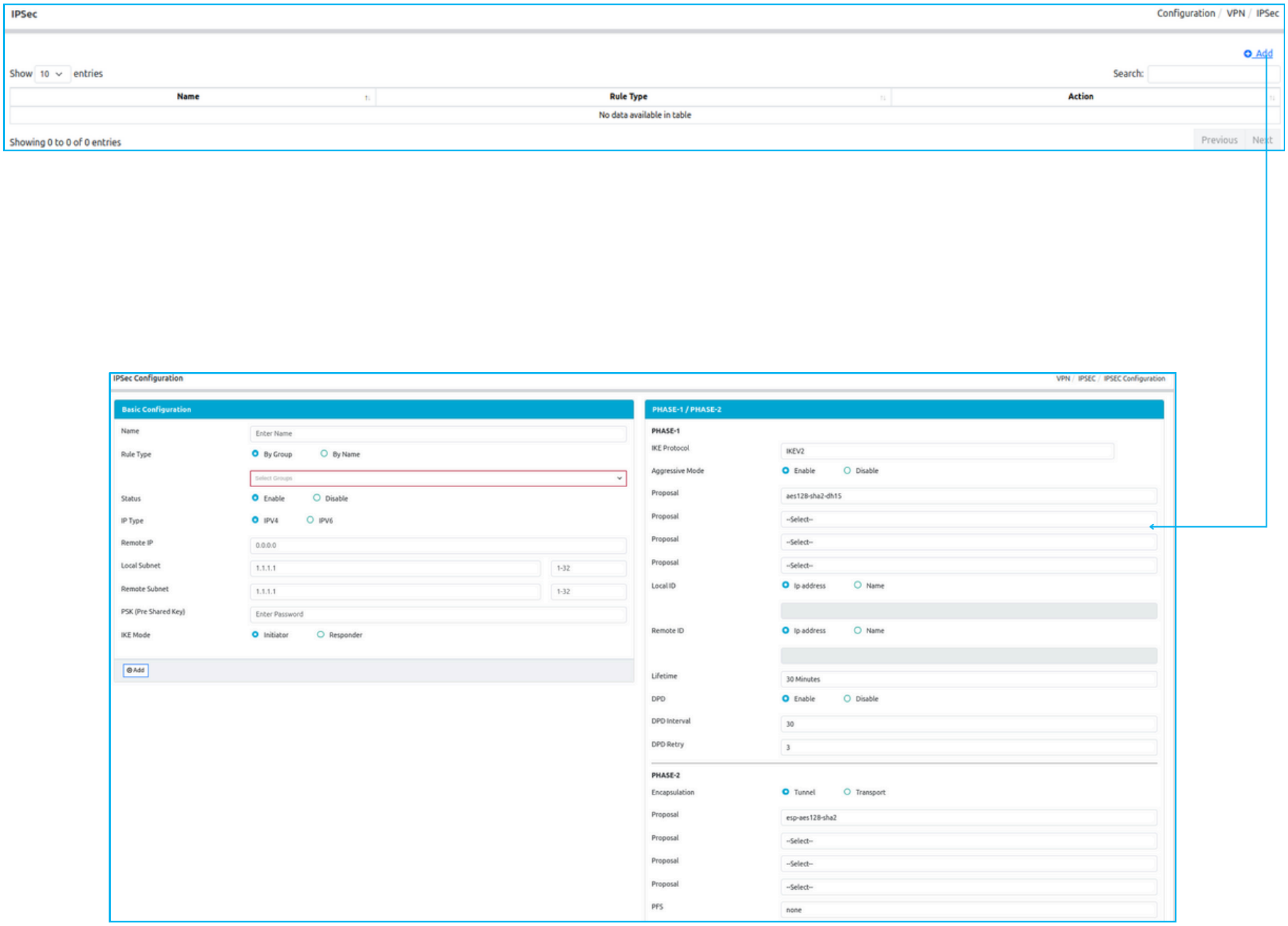
GRE Tap over IPv6

"GRE tap over IPv6" refers to the usage of Generic Routing Encapsulation (GRE) to create a virtual point-to-point network interface, often referred to as a "GRE tap," over an IPv6 network. This allows for the encapsulation and tunneling of various network protocols within IPv6 packets, enabling private communication channels over a public IPv6 network.

VPN - IPSec

Configuration → VPN → IPSec

IPsec (Internet Protocol Security) is a suite of protocols and standards that provide security services for communication at the network layer of the OSI model. It's widely used to secure communication over IP networks, including the internet. IPsec operates by encrypting and authenticating data to ensure confidentiality, integrity, and authenticity. IPsec provides a robust framework for securing data communication, making it a fundamental tool for network security in the modern digital landscape.



IKE(Internet Key Exchange): IKE establishes a secure, authenticated communication channel between two parties. IKE negotiates security associations (SAs), which are a set of mutually agreed-upon keys and algorithms used by both parties trying to establish a VPN connection. Here you can select proposals from the drop down. You can select upto four proposals at a time

DPD(Dead Peer Detection): Dead Peer Detection (DPD) is a method that network devices use to detect the availability of peer devices. It uses IPsec traffic patterns to reduce the number of messages needed to confirm a peer's availability.

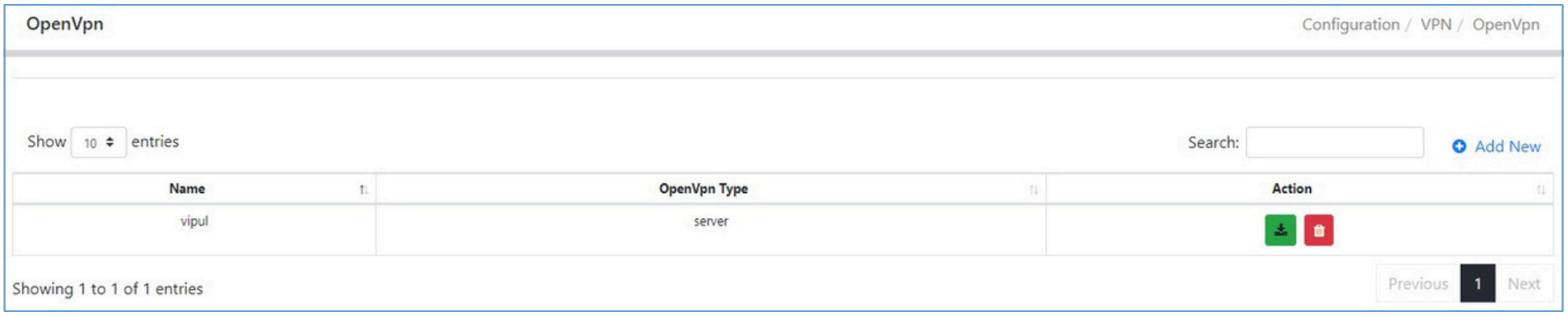
DPD Intervals: The Dead Peer Detection (DPD) interval for IPsec is 30 seconds by default. This means that the CPE Device will send DPD packets every 30 seconds when there is no traffic over the IPsec tunnel. If the peer doesn't respond the device will then disconnect the IPsec tunnel.

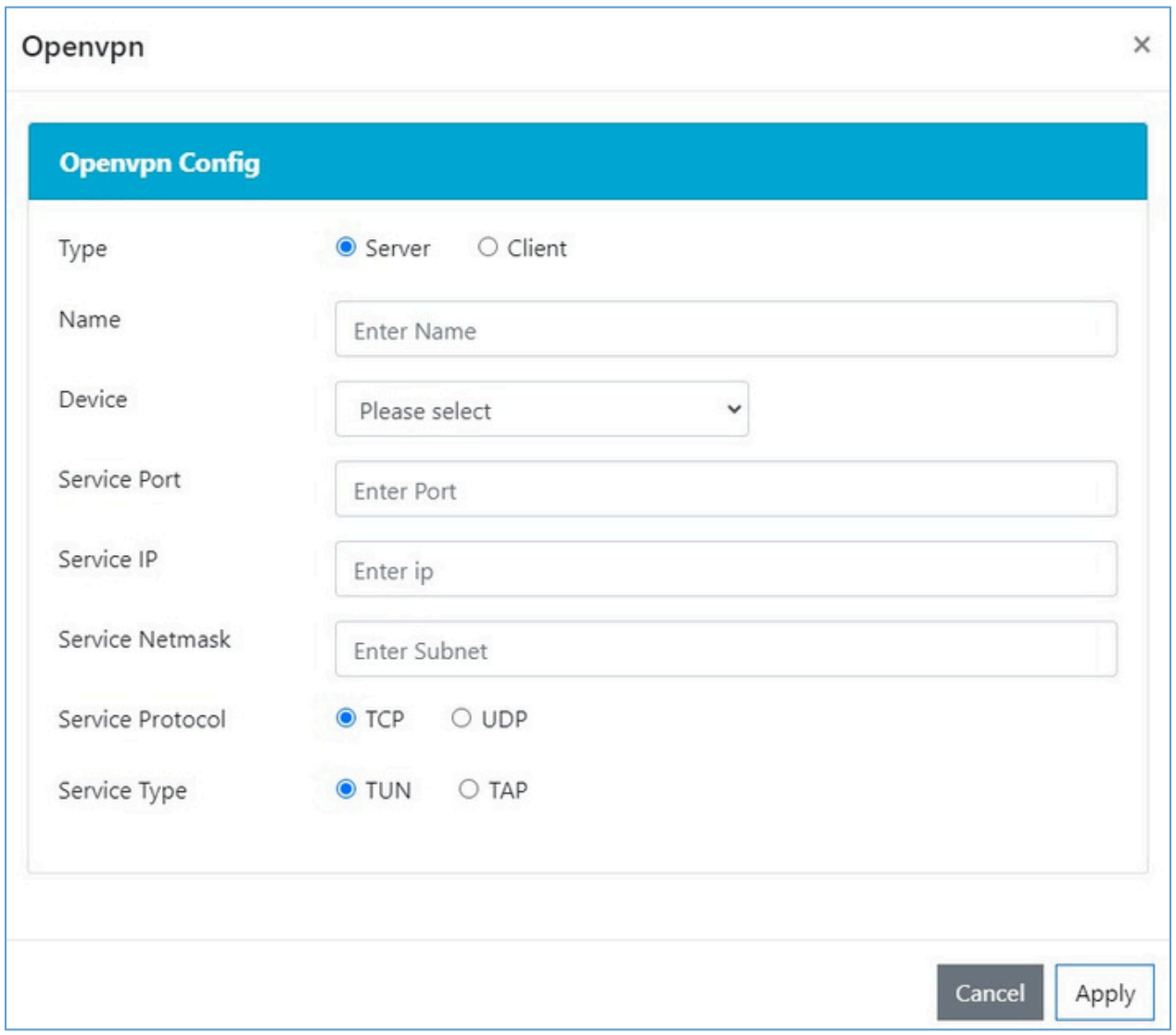
PFS: Perfect Forward Secrecy (PFS) prevents third parties from discovering a key value.

VPN - OpenVpn

Configuration → VPN → OpenVpn

OpenVPN is an open-source Virtual Private Network (VPN) software that allows for secure point-to-point or site-to-site connections. It provides a secure tunnel for data transmission over an insecure network, typically the internet. OpenVPNis known for its robustness, security, and flexibility, making it a popular choice for creating secure VPN connections.

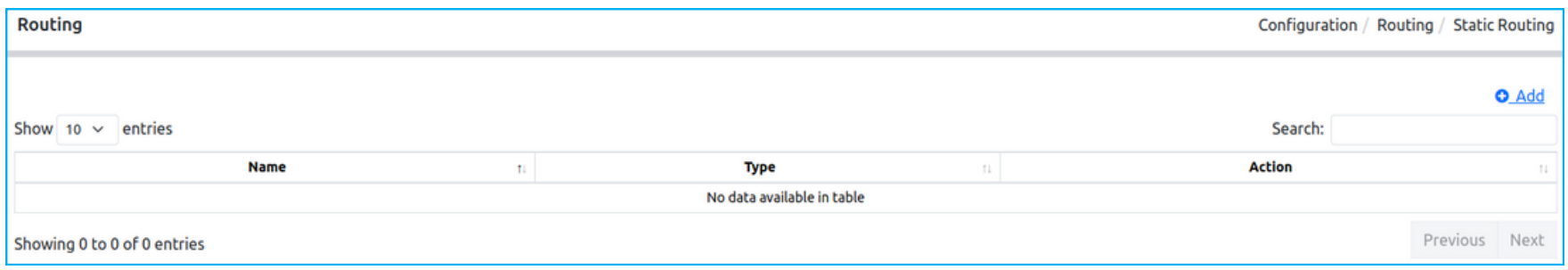




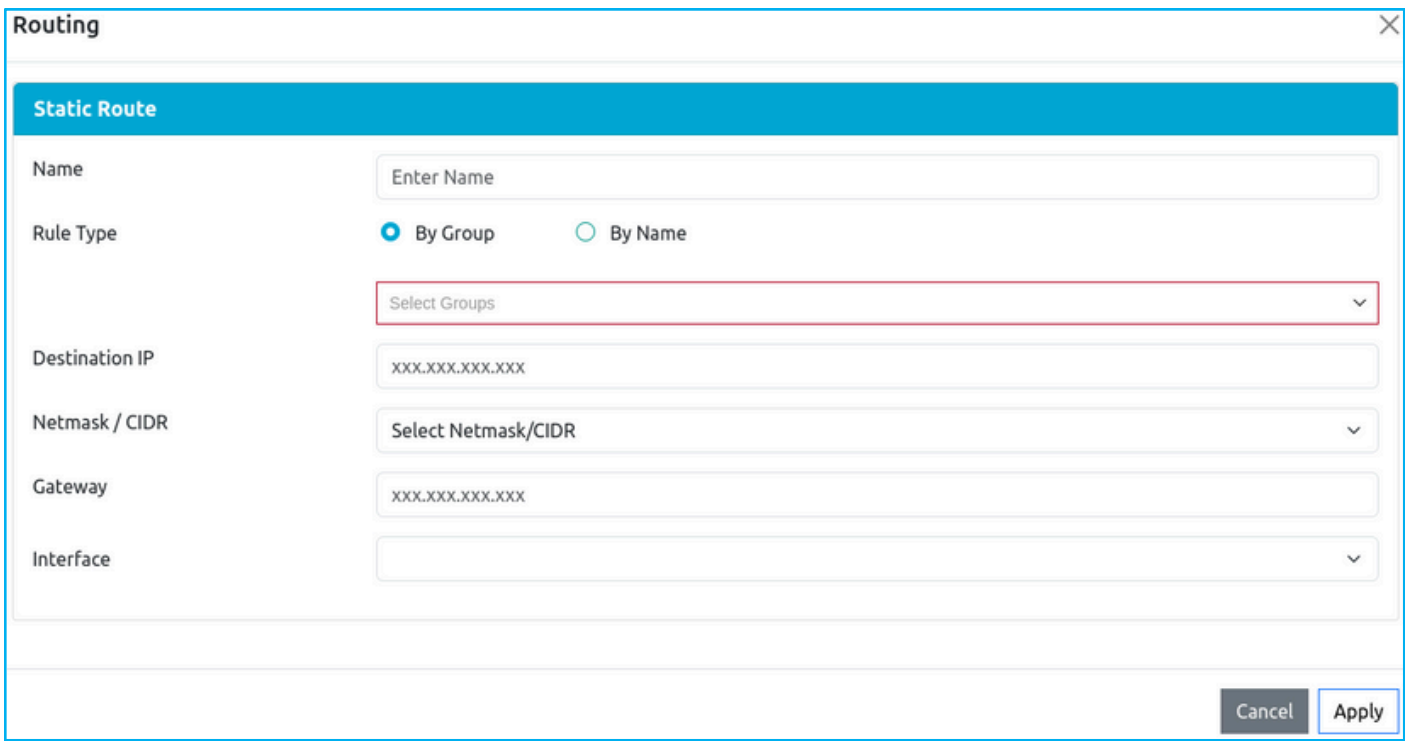
Routing - Static Route

Configuration → Routing → Static Route

A static route in a cloud controller is a manually configured path for network packets to reach a specific destination. It's setup within the cloud controller's networking or network configuration section, involving specifying the destination IP address or network and the next hop (router or gateway). Once configured, the static route directs traffic along the defined path.



Configuration → Routing → Static Route → Add



Destination IP: The destination IP refers to the specific IP address, IP address range, or subnet that the static route is intended to direct traffic towards. When a packet is being sent to a destination IP address, the static route specifies how that packet should be forwarded to reach that particular IP address or IP range.

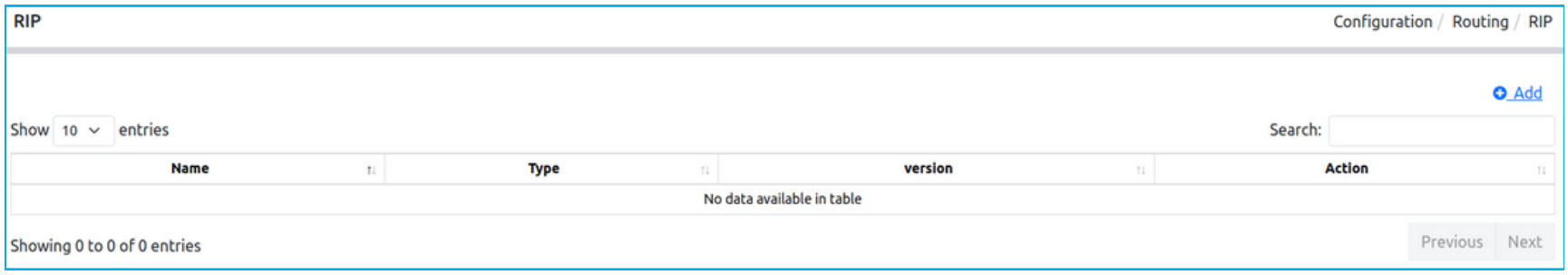
Netmask: A netmask (or subnet mask) is used to define the network portion of an IP address. It allows for the logical separation of an IP address into a network part and a host part. When configuring a static route, you specify the destination IP address or IP address range and its corresponding netmask. The netmask helps the router or networking device determine which packets should be sent alongthe static route based on the network portion.

Gateway: The gateway in a static route is the IP address of the next device, typically a router or Layer 3 switch, that the traffic is sent to in order to reach the specified destination IP address or subnet. This intermediary device then handles the further routing of the traffic towards the final destination based on the information in its routing table.

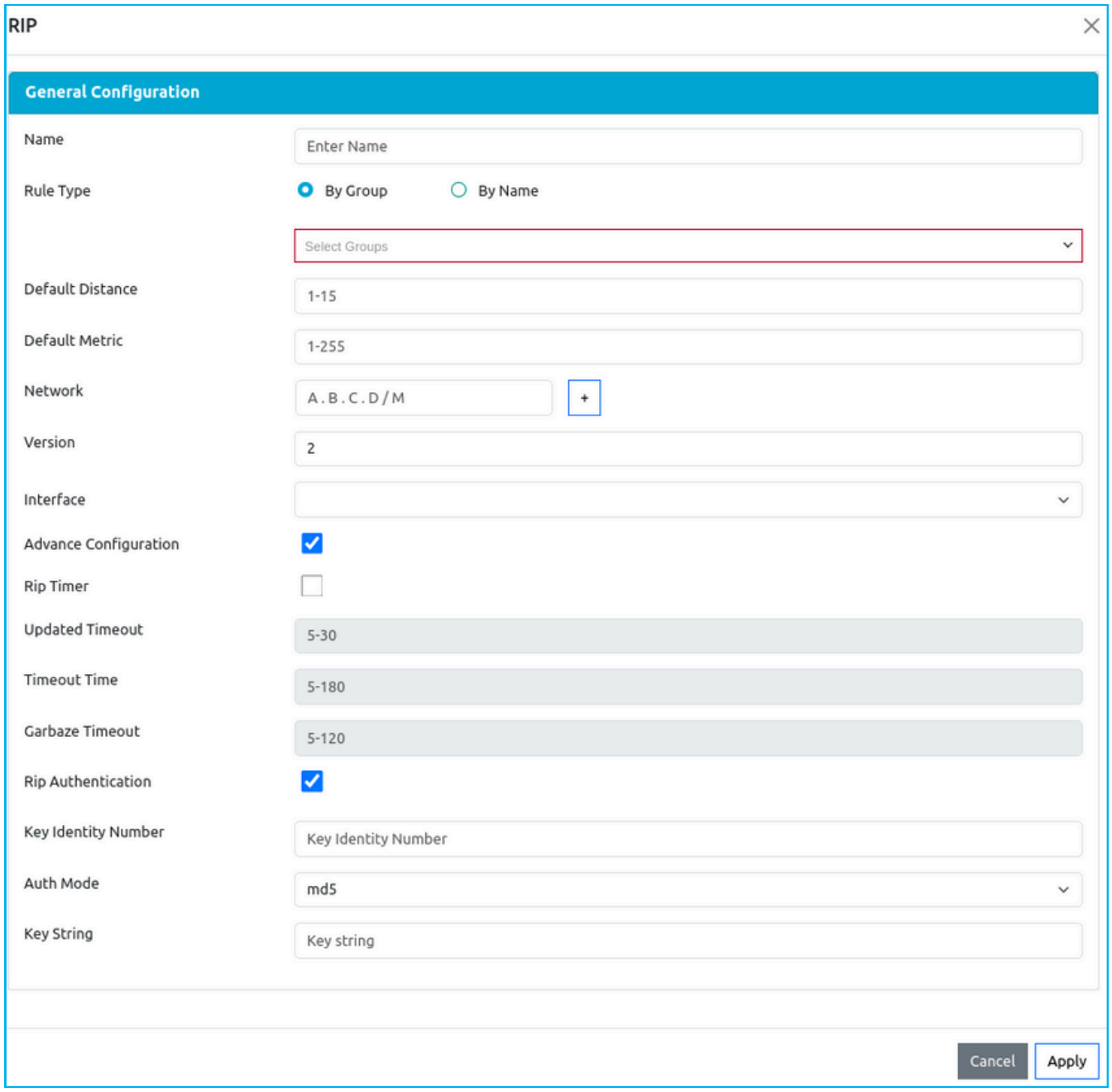
Routing - RIP

Configuration → Routing → RIP

RIP, or Routing Information Protocol, is one of the oldest and most basic distance vector routing protocols used in computer networking. It's designed to help routers dynamically share information about the paths or routes they know about in order to efficientlyreach various network destinations. While RIP is a straightforward and easy-to-configure routing protocol, it's generally not the best choice for large or complex networks due to its slow convergence and limitations. More modern protocols like OSPF (Open Shortest Path First) and BGP (Border Gateway Protocol) are often preferred for larger, more scalable networks.



Configuration → Routing → RIP → Add



Default Distance: Routing Information Protocol (RIP), the default administrative distance is 120. Administrative distance (AD) is a metric used by routers to determine the trustworthiness of a routing source. Lower AD values indicate higher trust. when a router receives routing information from multiple sources (e.g., RIP, OSPF, EIGRP), it uses the administrative distance to determine which routeto include in its routing table. Lower administrative distances are preferred, so a route with a lower administrative distance willbe chosen over one with a higher administrative distance.

Default Metric: The default metric used is hop count. The hop count is a simple metric that indicates the number of routers (hops) a packet must traverse to reach a destination network. Each hop represents a router the packet goes through. For RIP, the maximum hop count allowed for a route is 15. If a route has a hop count of 16 or higher, it is considered unreachable (infinity) in RIP terminology.

Network: Input IP and Netmask (0.0.0.0/255.255.255.255). Here you can add multiple network by clicking on + the Button.
Version: Two Versions of RIP are here you can choose any one. The above page is showing when you choose version 1. If you choose version 2 the page will extend with some more features.

More: Enable the check box of Advance Configuration for further settings of version 1.

RIP Timer: Enable the check box of RIP timer to set the Updated Timeout, Timeout Time and Garbage Timeout

Updated Timeout: RIPv1 has a simple operation without features like authentication, subnet masks, or updated timeout mechanisms. Updates are sent every 30 seconds regardless of whether there have been changes in the network or not. The "timeout" in RIPv1 refers to the time after which a route is considered invalid if no update is received for that route.

Timeout Time: The "timeout" refers to the time it takes for a route to be considered invalid or expired if no updates are received for that route. There are typically two timeout intervals associated with RIP: the "route timeout" and the "holddown timeout."

Key Identity Number: The key chaindetermines the set of keys that can be used on the interface. If a key chain is not configured, no authentication is performed on that interface. Define the key or keys on the key chain and specify the password or key-string to be used in the key.

AuthMode: Choose the AuthMode options from the dropdown button. The options are md5and Text.

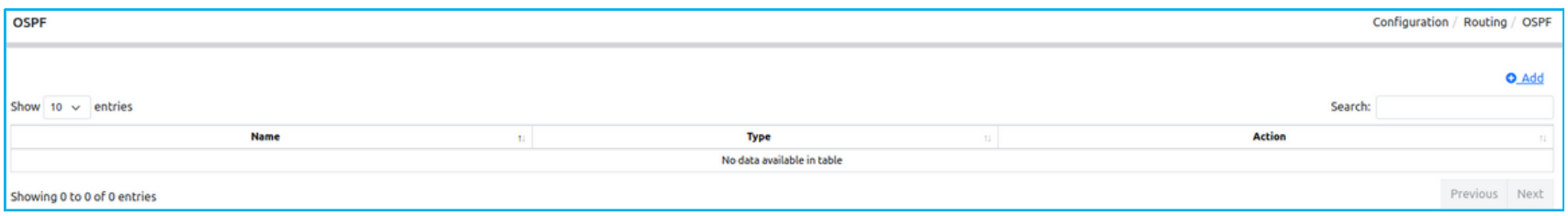
Md5: Message Digest Algorithm 5 Authentication:This mode uses MD5, a cryptographic hash function, to generate a digest (hash) based on the key string and parts of the RIP packet. The digest is sent along with the RIP packet. This provides a more secure way of authenticating the RIP packets because the key string itself is not transmitted in the clear.

Text: In this mode, the key string is sent in plain text along with the RIP packet. It is important to ensure that the key string is kept confidential as it's sent in an unencrypted form.

Key String: The "key string" is a shared secret, essentially a password or passphrase, that is configured on the routers participating in RIPv2 authentication. This key string is used to authenticate the routing updates. Both sending and receiving routers must have the same key string configured to authenticate and accept RIPv2 updates.

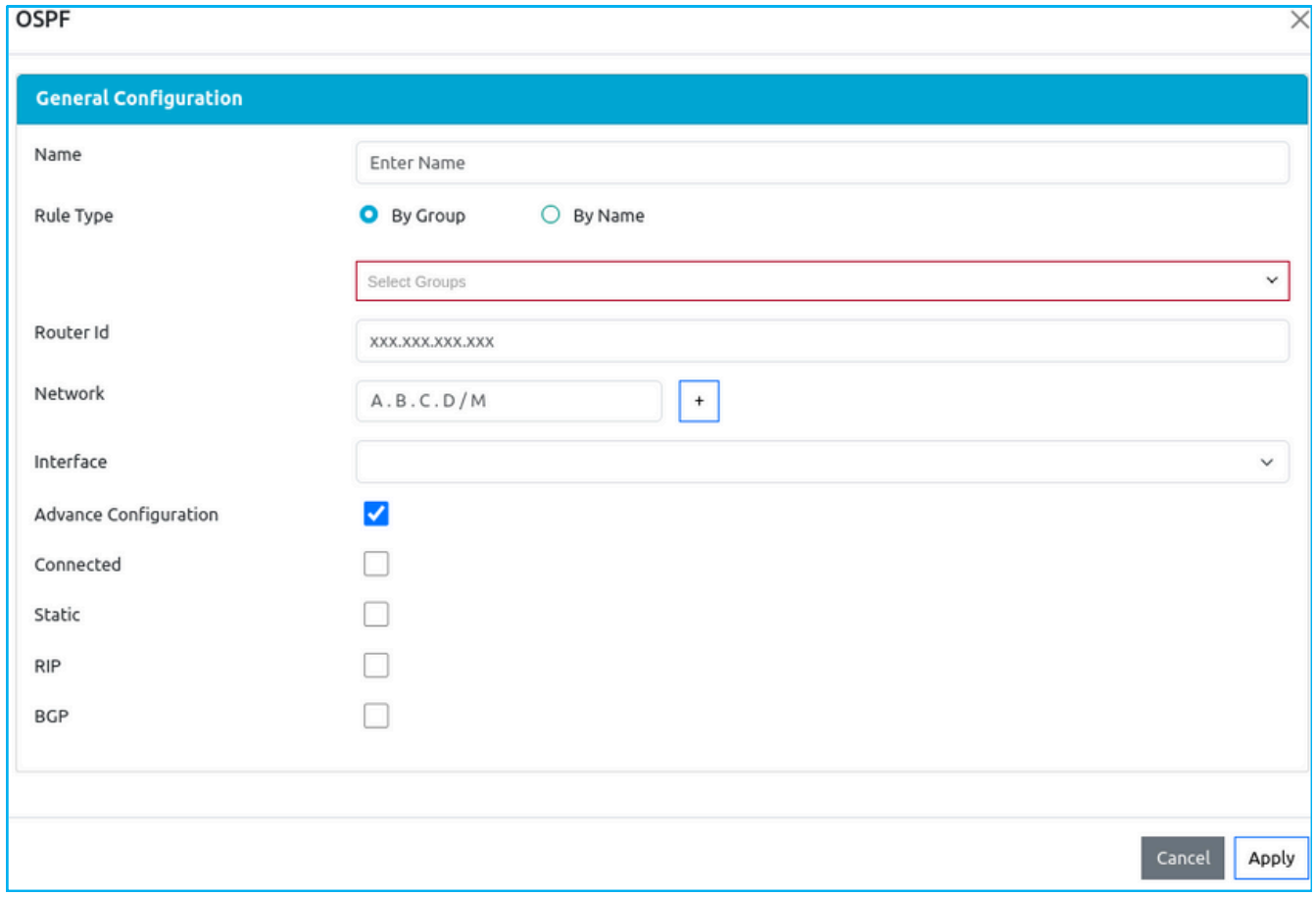
Routing - OSPF

Configuration → Routing → OSPF



Open Shortest Path First (OSPF) is a link-state routing protocol used for finding the shortest path in a network. It maintains detailed network topology information, divides networks into areas for scalability, uses cost metrics to determine optimal paths, employs Hello packets for neighbor relationships, and allows for fast network convergence. OSPF is widely used in large networks due to its efficiency andscalability.

Configuration → Routing → OSPF → Add

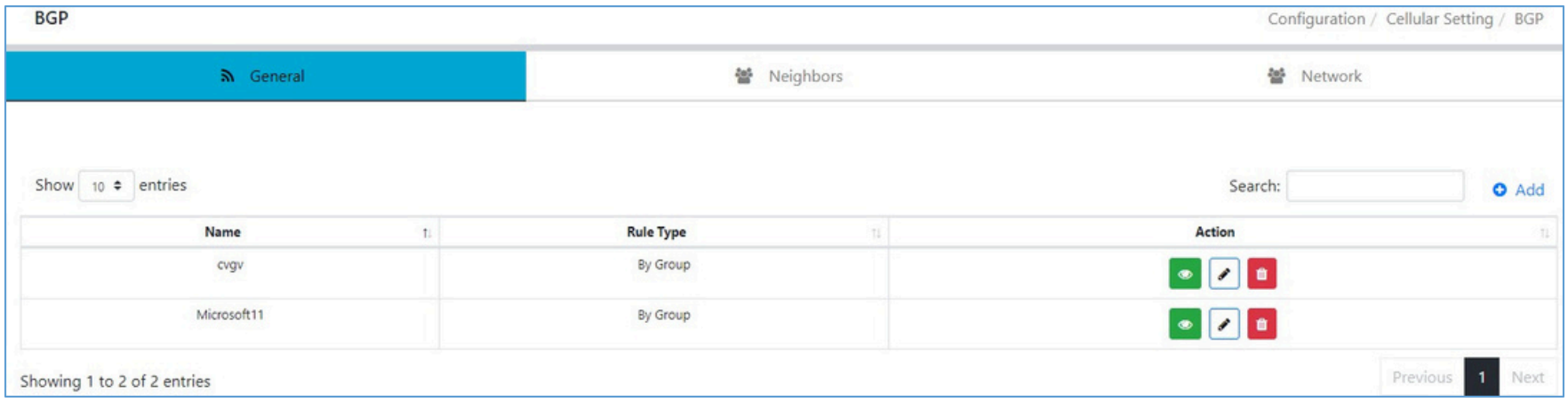


Router ID: The Router ID (RID) is a unique identifier assigned to each router participating in the OSPF routing domain. It's a 32-bit number, often represented in dotted-decimal format (e.g., 192.168.0.1). The RID is crucial for several OSPF operations, including neighbour establishment, database synchronisation, and SPF (Shortest Path First) tree calculation.

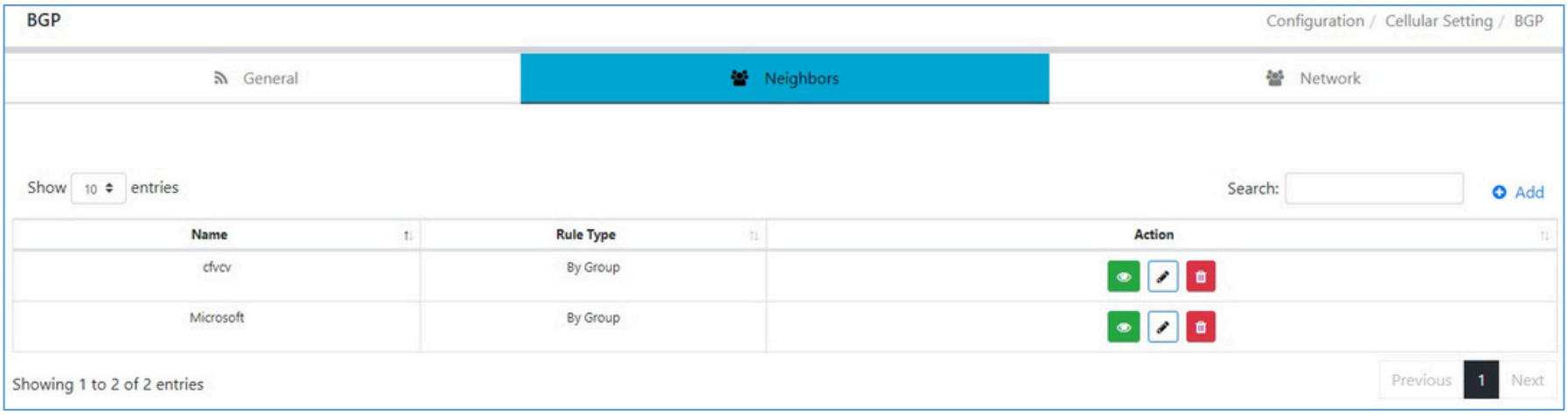
Network: Input IP and Netmask (0.0.0.0/255.255.255.255). Here you can add multiple network by clicking on the + Button.

Routing - BGP

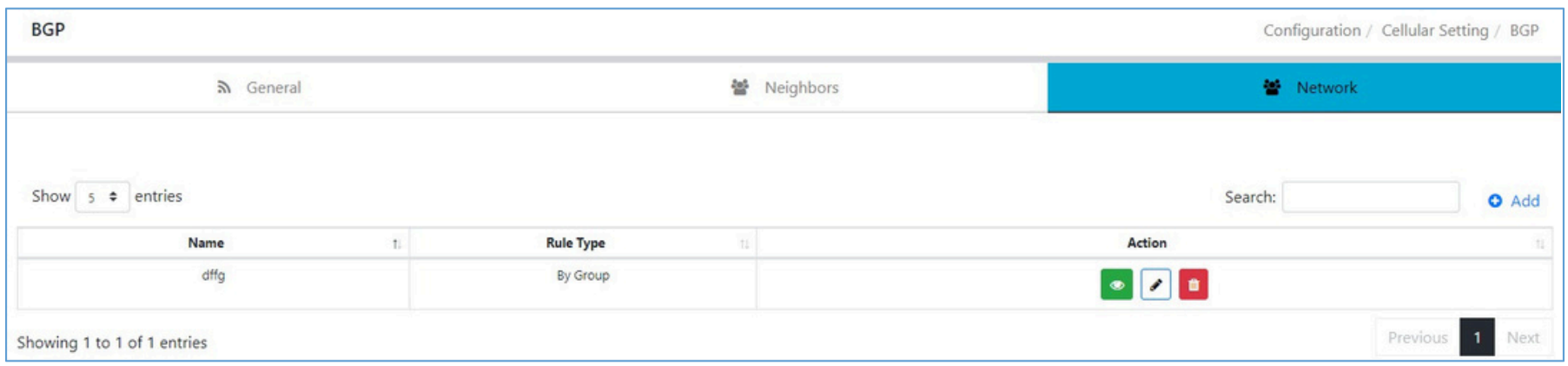
Configuration → Routing → BGP



BGP, or Border Gateway Protocol, is a standardized exterior gateway protocol used to exchange routing and reachability information between autonomous systems (ASes) on the internet. It's a path vector protocol, which means it's designed to make routing decisions based on the shortest path, policies, and rule sets.

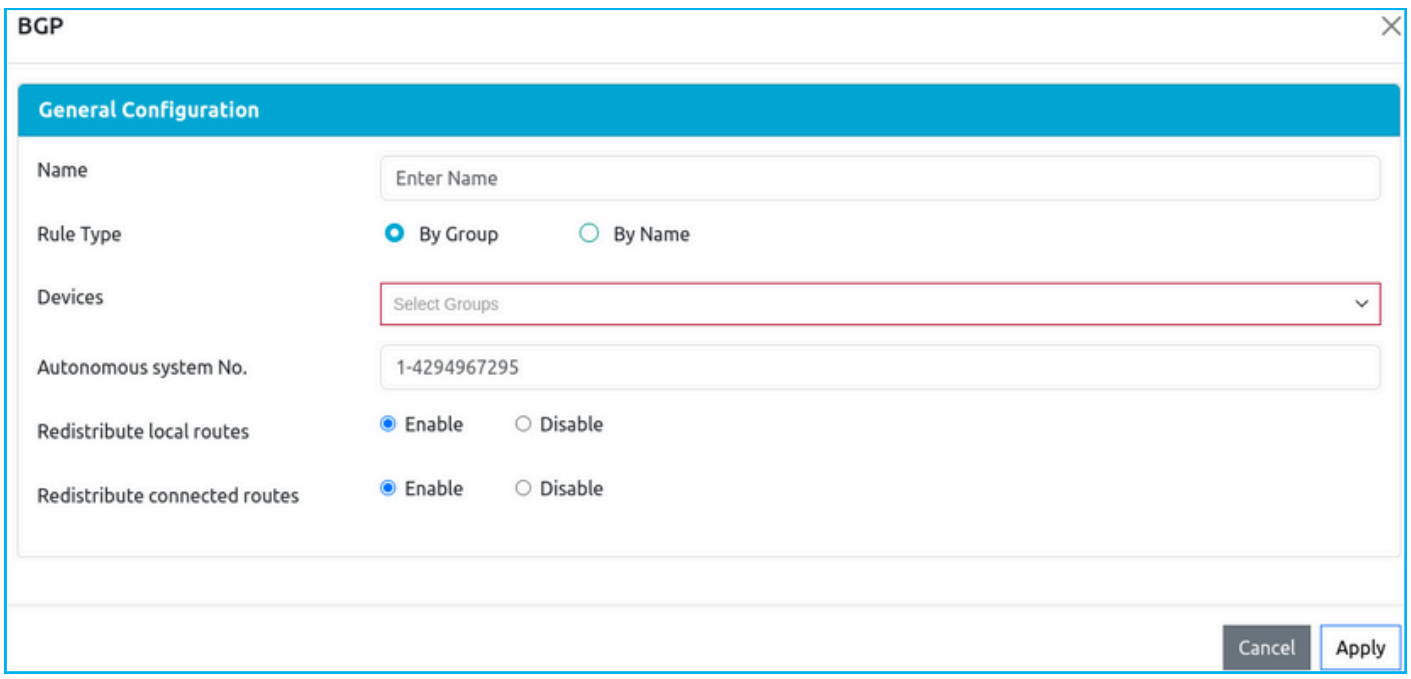


BGP establishes neighbor relationships with other BGP-speaking routers. These peeringsare essential for exchanging routing information.



Network generally refers to a specific IP network or subnet that an autonomous system (AS) advertises to its BGP neighbors. When a network is advertised in BGP, it informs other BGP routers about the reachability of that network through the advertising router.

Configuration → Routing → BGP → General → Add



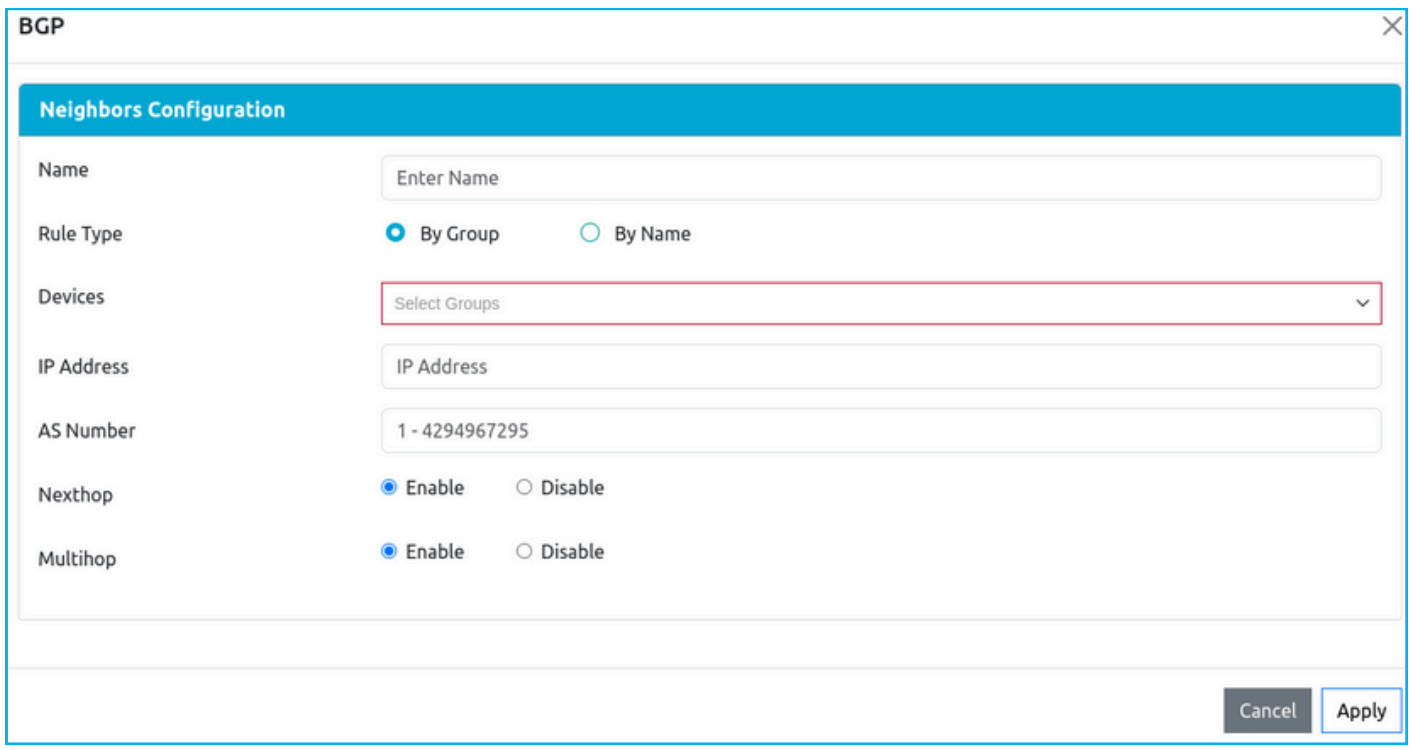
Devices: Select a Device Group or a Device in which you want to create BGP Server.

Autonomous System No: In Border Gateway Protocol (BGP), an Autonomous System Number (ASN) is a unique numeric identifier assigned to an autonomous system (AS). An AS is a collection of IP networks and routers under the control of a single organization that presents a common routing policy to the internet.

Redistribute local routes: The redistribute local routes refers to the process of advertising routes that are locally generated or exist within the router's routing table into the BGP routing table. This allows these routes to be propagated to BGP neighbors and potentially further into the BGP network. Remember to exercise caution when redistributing routes into BGP, as it can have significant impacts on your network's routing behavior. Make sure to consider the implications on route selection, routing policy, and potential routing loops.
Also, ensure that proper filtering and route policies are in place to control the routes being redistributed and to ensure that only the intended routes are advertised into the BGP network.

Redistributing connected routes: It is a common practice when you want to advertise routes from interfaces that are directly connected to a BGP router into the BGP routing table.Keep in mind that redistributing connected routes into BGP should be done with caution, and you should consider the implications on route selection, routing policy, and potential routing loops. It's important to have a good understanding of your network's requirements and design before redistributing routes into BGP.

Configuration → Routing → BGP → Neighbor → Add



Devices: Select a Device Group or a Device in which you want to create BGP Server.

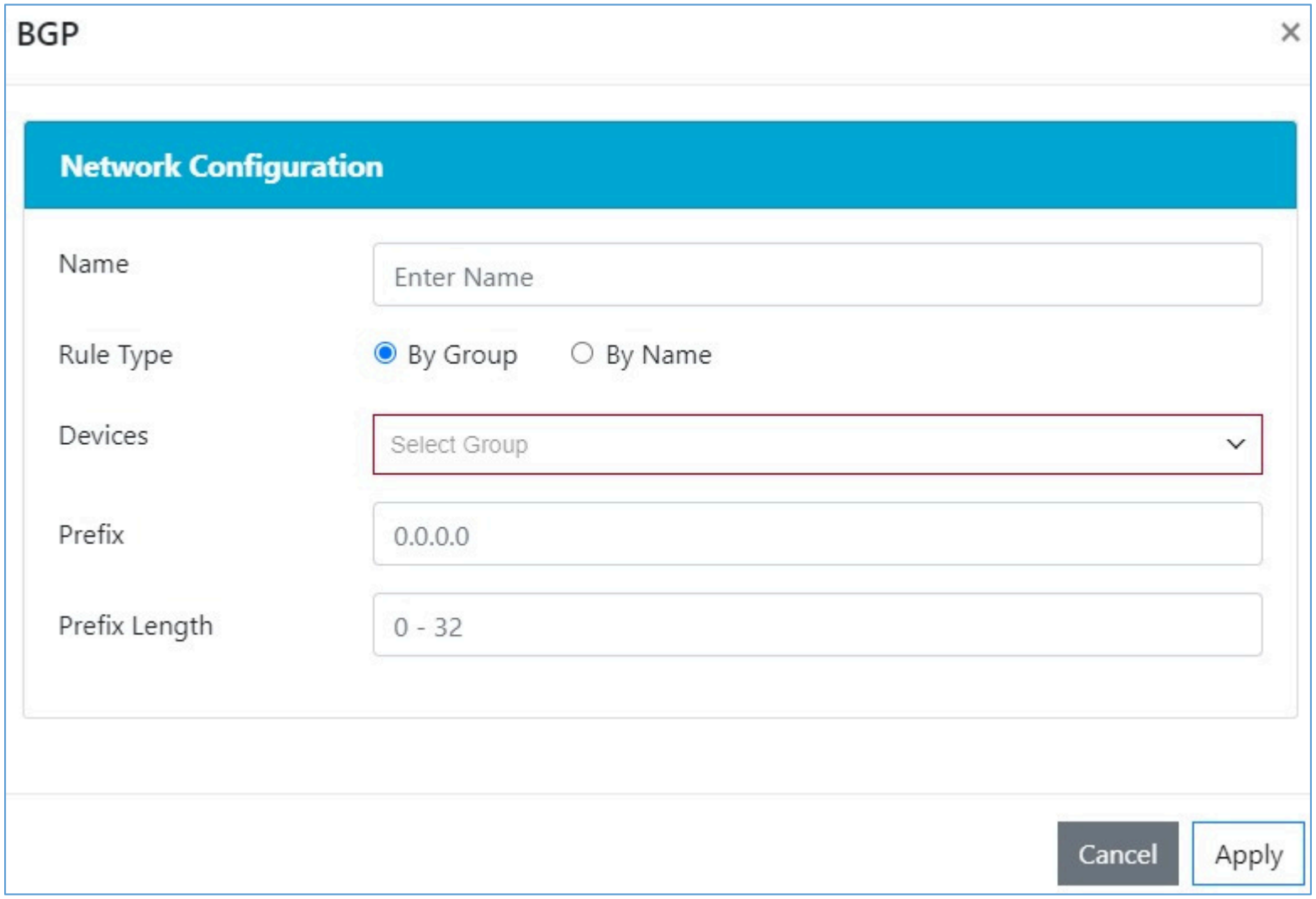
IP Address: The IP address is crucial in BGP for defining the neighbors with whom the BGP router will establish TCP connections and establish BGP neighbor relationships for the exchange of routing information.

AS Number: An Autonomous System Number (ASN) plays a significant role in establishing BGP neighbor relationships and routing information exchange. An ASN is a unique identifier assigned to an autonomous system, which is a collection of IP networks and routers under the control of a single organization that presents a common routing policy to the internet. When configuring a BGP neighbor relationship, you need to specify the ASN of both the local router (your own ASN) and the remote router (the neighbor's ASN).

Next hop: The next-hop is a crucial attribute associated with a BGP route. It specifies the IP address of the next router or hop that should be used to reach the destination network for a particular BGP route. This information is essential for the proper forwarding of packets in a BGP network.

Multihop: The "multihop" feature allows for the establishment of a BGP neighbor relationship over a non-directly connected path, spanning multiple hops. This feature is used when you need to set up a BGP neighbor relationship with a router that is not on a directly connected subnet. The typical BGP behavior is to establish a neighbor relationship directly with an adjacent router on a shared network segment. However, in certain scenarios, you may want to establish a BGP neighbor relationship with a router that is more than one hop away, perhaps on a different subnet. The multihopfeature enables this by allowing you to specify the number of hops (routers) between your BGP router and the remote BGP router.

Configuration → Routing → BGP → Network → Add



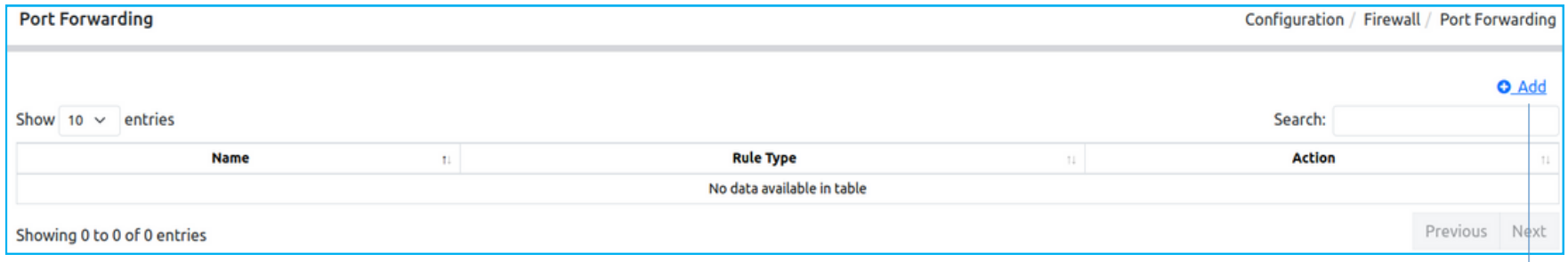
Devices: Select a Device Group or a Device in which you want to create BGP Server.

Prefix: Aprefix refers to a unique identifier for a route in an IP network. It consists of an IP address and a prefix length, expressed in CIDR (Classless Inter-Domain Routing) notation.

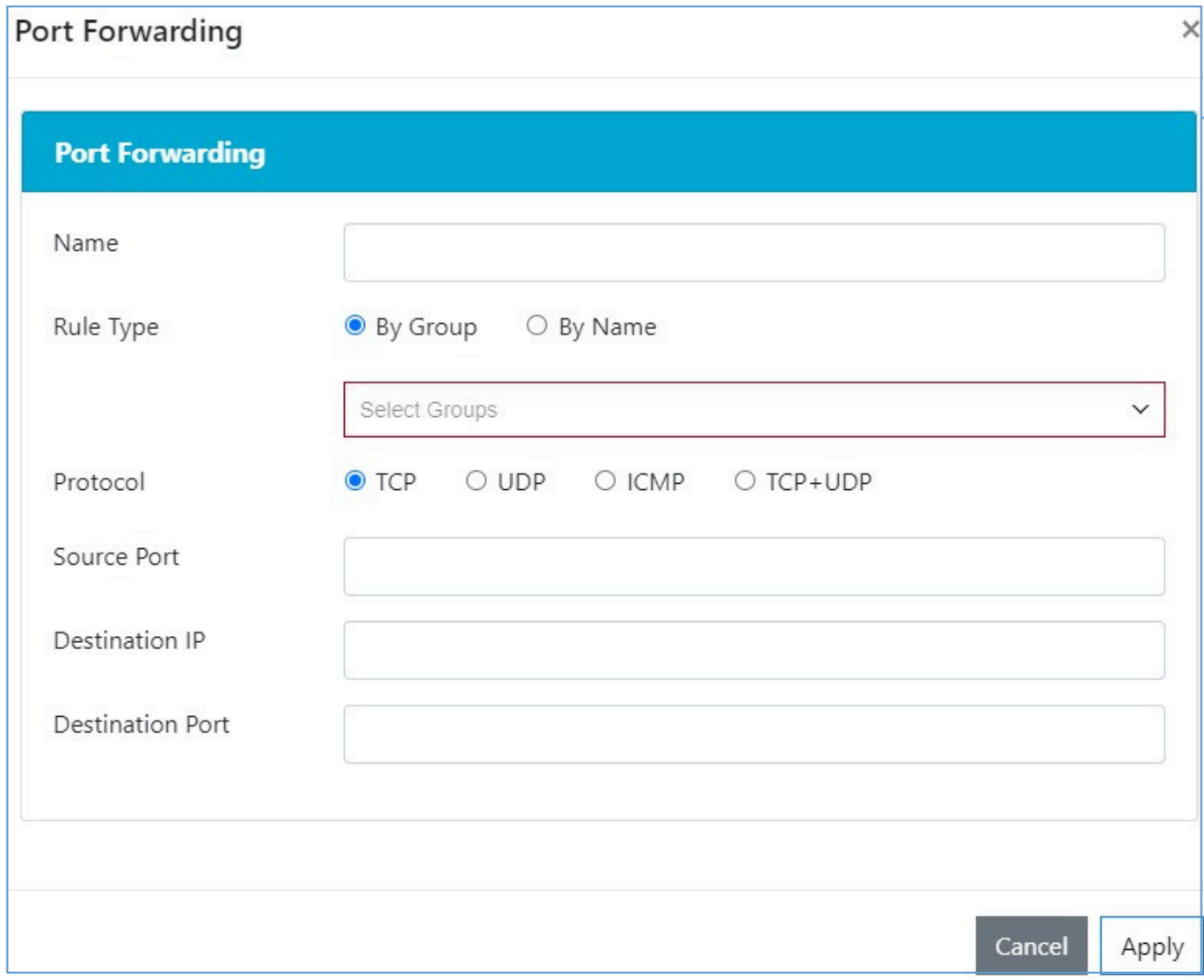
Prefix Length: The prefix length indicates the number of bits in the network address that are fixed (representing the network portion) and the number of bits that can vary (representing the host portion). It is denoted using CIDR notation (e.g., /24),where the number after the slash (/) indicates the length of the network prefix in bits.
For example, a BGP prefix could be expressed as "192.168.0.0/24", where: "192.168.0.0" is the IP address.
"/24" denotes the prefix length, indicating that the first 24 bits of the IP address represent the network portion.

Firewall - Port Forwarding

Configuration → Firewall → Port forwarding



Port forwarding is a networking technique used to redirect network traffic from one port on a network device to another port on a different device. It allows incoming traffic to reach a specific service or application hosted on a private network, which isbehind a network address translation (NAT) or firewall.Port forwarding is a powerful tool that helps optimize network traffic flow, enhance accessibility, and efficiently manage services within a network. However, it's important to configure it securely to maintainnetwork security.



Protocol: The term protocol refers to the specific networking protocol being used for forwarding traffic from one port to another.

TCP: TCP or Transmission Control Protocol, is one of the core protocols of the Internet Protocol (IP) suite. It operates at the transport layer (Layer 4) of the OSI model and is responsible for providing reliable, connection-oriented communication between devices over an IP network. TCP is widely used for various applications and services on the internet. TCP is used by a wide range of applications, including web browsing, email, file transfers (e.g., FTP), remote administration (e.g., SSH), and more. It forms the basis for reliable data transmission over the internet and is a critical protocol for modern network communication.

UDP: UDP, or User Datagram Protocol, is a connectionless and lightweight transport layer (Layer 4) protocol in the Internet Protocol (IP) suite. Unlike TCP, UDP does not provide mechanisms for reliable, ordered, or error-checked delivery of data. It is designed for fast and efficient data transmission, making it suitable for applications where speed and low latency are more critical than data reliability. UDP is faster and more efficient than TCP, it lacks features such as reliability and error correction. Therefore, applications using UDP must implement their own error detection and correction mechanisms if needed. The choice between UDP and TCP depends on the specific requirements of the application, balancing speed
versus reliability.

ICMP: ICMP, or Internet Control Message Protocol, is an integral part of the Internet Protocol (IP) suite and operates at the network layer (Layer 3). It's primarily used for diagnostics and error reporting in IP networks, providing a means to communicate error and control messages between devices.ICMP is an essential protocol for network troubleshooting, diagnostics, and management. It provides valuable information about the network's health and assists in identifying and resolving various network-related issues. However, due to its critical role, ICMP messages should be handled carefully to avoid misuse or potential security risks.

TCP+UDP: You can use both TCP and UDP simultaneously, depending on the requirements. For instance, a VoIP application may use UDP for real-time audio transmission (low latency), while using TCP for signaling and control (reliability).

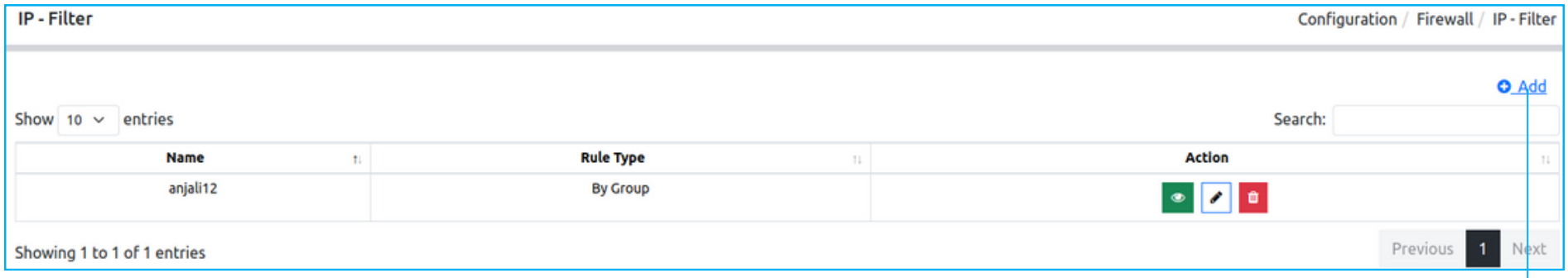
Source Port: The source port refers to the port number from which the incoming connection or data packet originates. When a client initiates a connection to a server or service, it typically selects a source port as part of the communication process. In the context of port forwarding, the source port is important because it helps determine which specific port on the client side is making the initialrequest. The source port is often dynamically assigned by the client's operating system or application.

Destination IP: The destination IP address is the specific IP address to which data packets are directed and where they are intended to be delivered within a network.

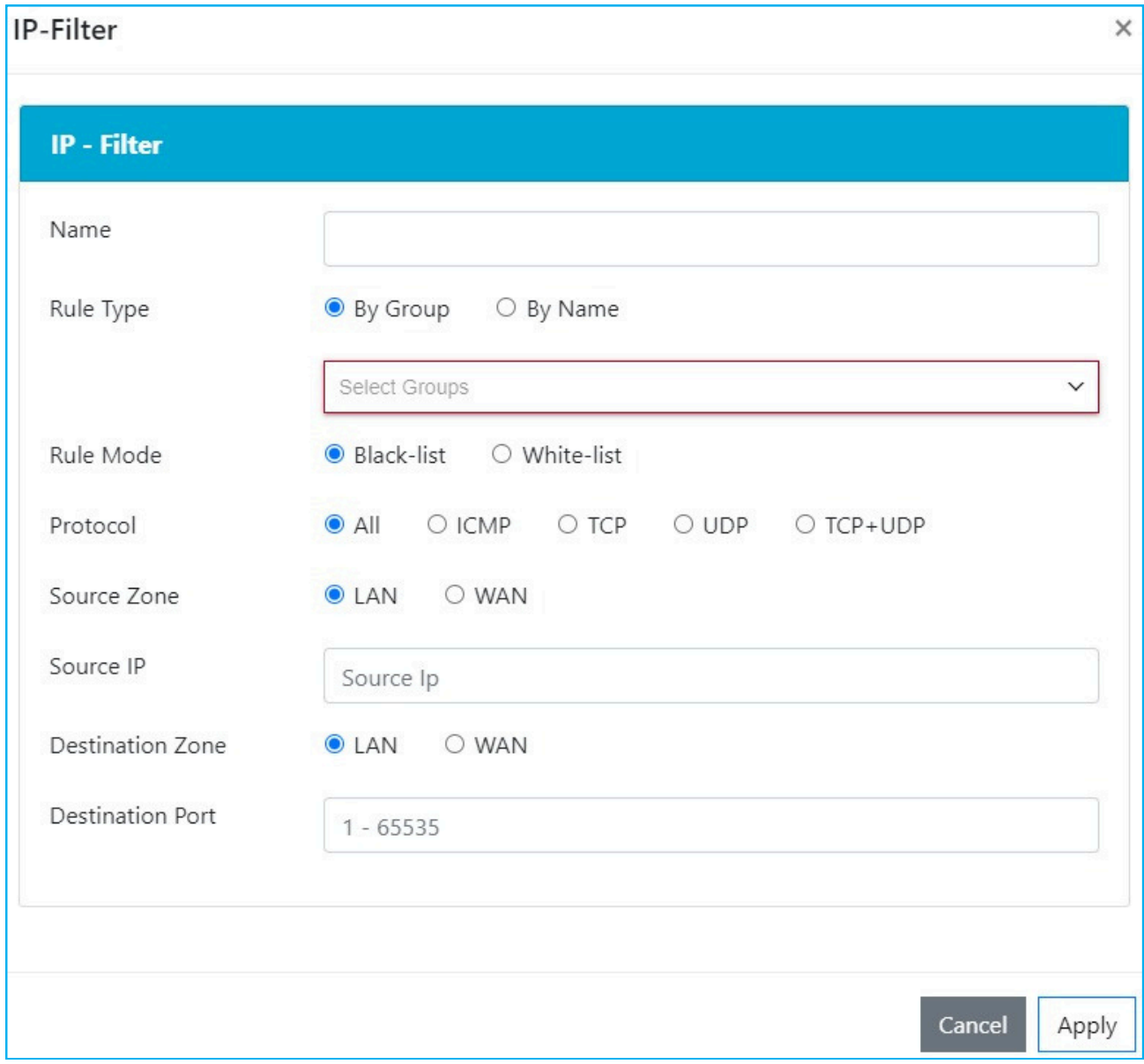
Destination Port: The destination port refers to the port number on a network device (such as a computer, server, or network appliance) to which incoming network traffic is directed. It helps determine which specific service or application running on the destination device should receive the incoming packets.

Firewall - IP Filter

Configuration → Firewall → IP Filter



IP filtering, often referred to as packet filtering, is a technique used in networking and network security to control the flow of network traffic based on specific criteria related to IP addresses, ports, protocols, or other attributes present in the headers of datapackets. It allows or denies network traffic based on a predefined set of rules or policies.



Rule Mode: Rule mode refers to the operational state or behavior of a rule within a firewall or other network security device. A rule typically defines a specific action or set of actions to be taken based on defined criteria such as source/destination addresses, ports, protocols, and more.

The appropriate mode is selected based on the desired outcome, whether it's allowing specific traffic, denying unwanted traffic,logging traffic for analysis, triggering alerts, or closely inspecting traffic for security purposes.

Enable Blacklist if you want to deny unwanted traffic and enable Whitelist if you want to allow specific traffic.

Protocol: For protocol refer to Page nos. 80 and 81.

Source Zone: Asource zone refers to a specific network segment, area, or domain from which network traffic originates. It is part of the broader concept of network segmentation and is commonly used in firewall and security policies to define rules based on the source of the traffic.
Choose LAN or WAN according to your choice.

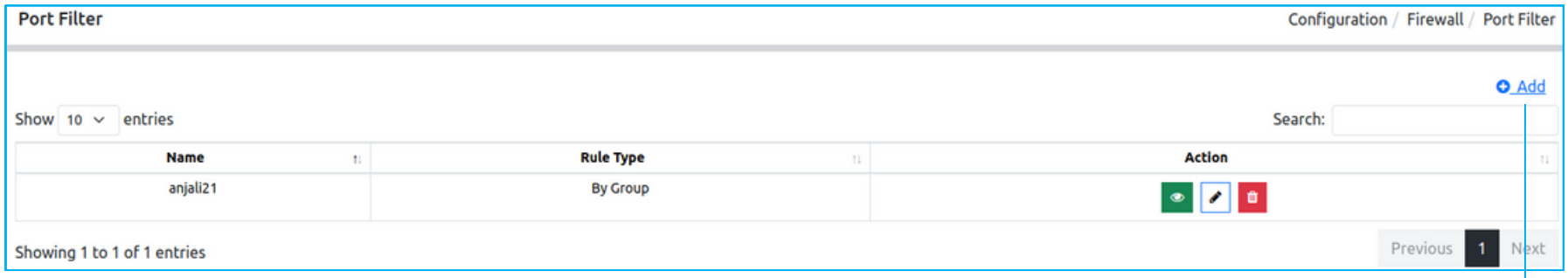
Source IP: The source IP(Internet Protocol) address is a fundamental component of network communication. It identifies the origin or sender of a packet or data transmission in a network. Each device connected to a network, whether it's a computer, server, router, or any other networked device, is assigned a unique source IP address.

Destination Zone: A destination zone refers to a designated area or grouping of network segments, devices, or systems within a network where incoming traffic is directed or intended to reach. It is an important aspect of access control and traffic management.
Choose LAN or WAN according to your choice.

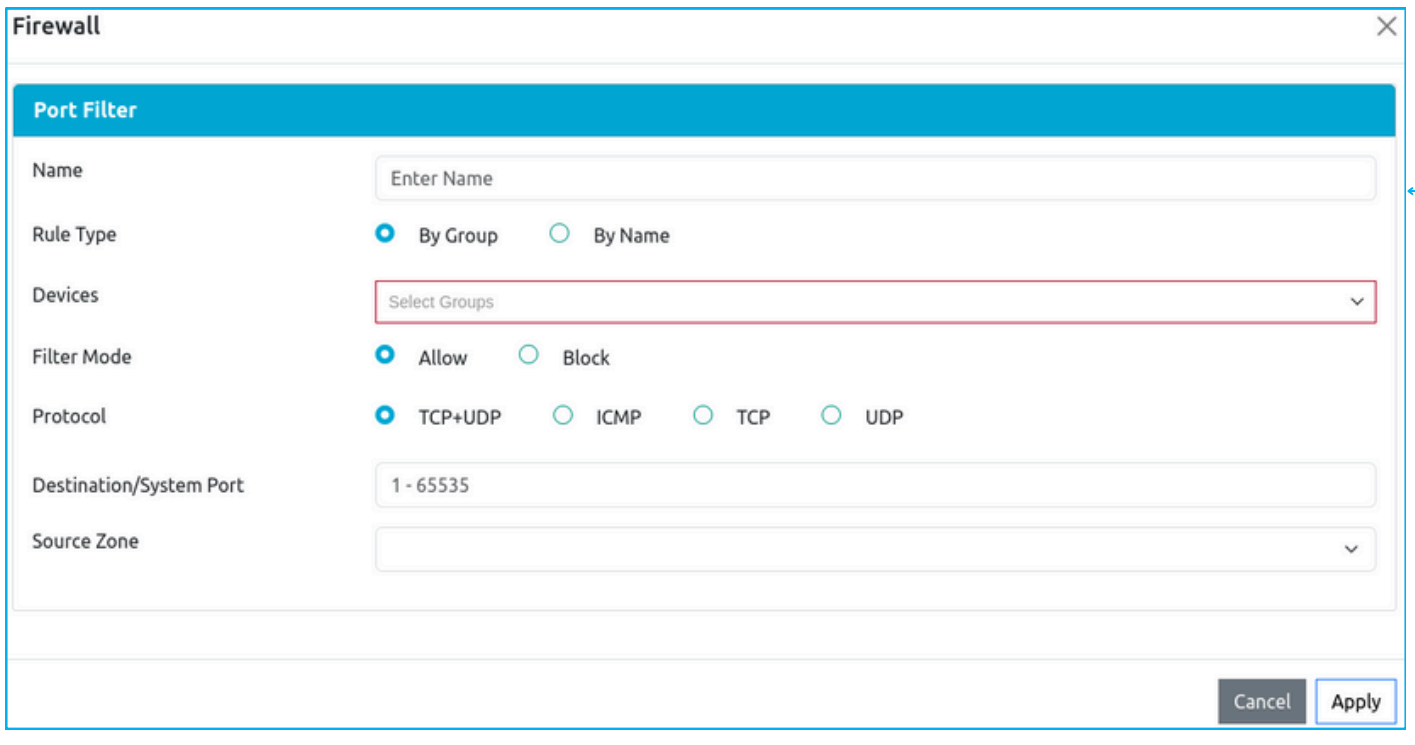
Destination Port: The "destination port" is a port number used in networking to identify the intended recipient or service on a device to which incoming network traffic is directed. In the context of the transport layer protocols like TCP (Transmission Control Protocol) and UDP (User Datagram Protocol), the destination port is an essential component of network communication.
Port Numbers Range:
Destination port numbers range from 0 to 65535.
Ports from 0 to 1023 are well-known ports and are reserved for system services or protocols (e.g., HTTP uses port 80, SMTP uses port 25).
Ports from 1024 to 49151 are registered ports and can be used by user applications and protocols.
Ports from 49152 to 65535 are dynamic or private ports and are available for temporary use by client applications.

Firewall - Port Filter

Configuration → Firewall → Port Filter



Port filtering is a network security measure that involves controlling or restricting access to specific network ports on a device or network. A port is a virtual endpoint for communication, and filtering ports helps regulate incoming and outgoing network traffic based on predefined rules and policies.



Filter Mode: Filter mode" in networking and network security refers to the behavior and action taken by a filtering system, such as a firewall or security device, when a data packet or network traffic matches a specific filtering rule. The mode determines what action is applied to the traffic based on the rules defined in the filter.

Enable the appropriate filter mode. There are two filter modes Allow and Block.

Allow: In "allow" mode, the filtering system allows traffic that matches the specified rules to pass through or be processed. Traffic that does not match any rules might be implicitly denied.

Block: In Block mode, the filtering system blocks or rejects traffic that matches the specified rules. Traffic that does not match any rules might be implicitly allowed or dropped.

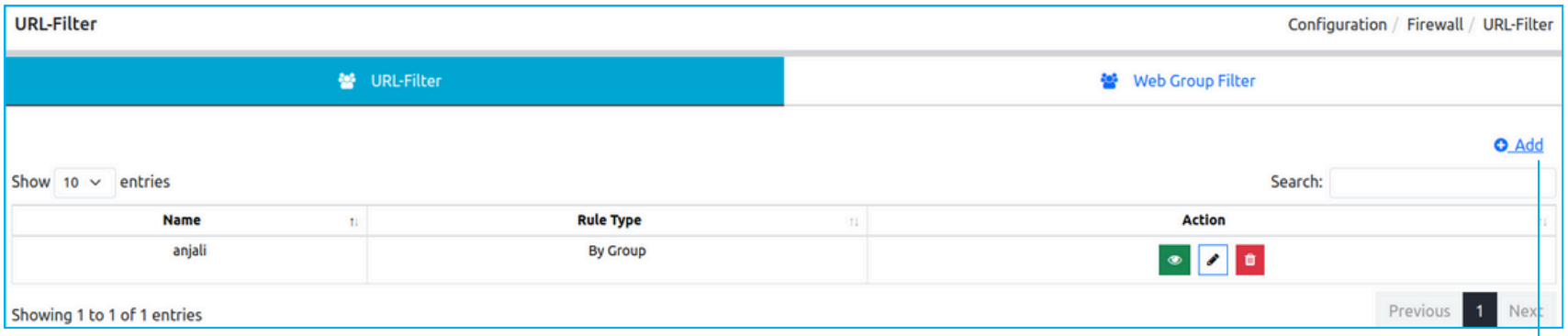
Protocol: Refer to page no 80 and 81.

Source Zone: Refer to page no 83

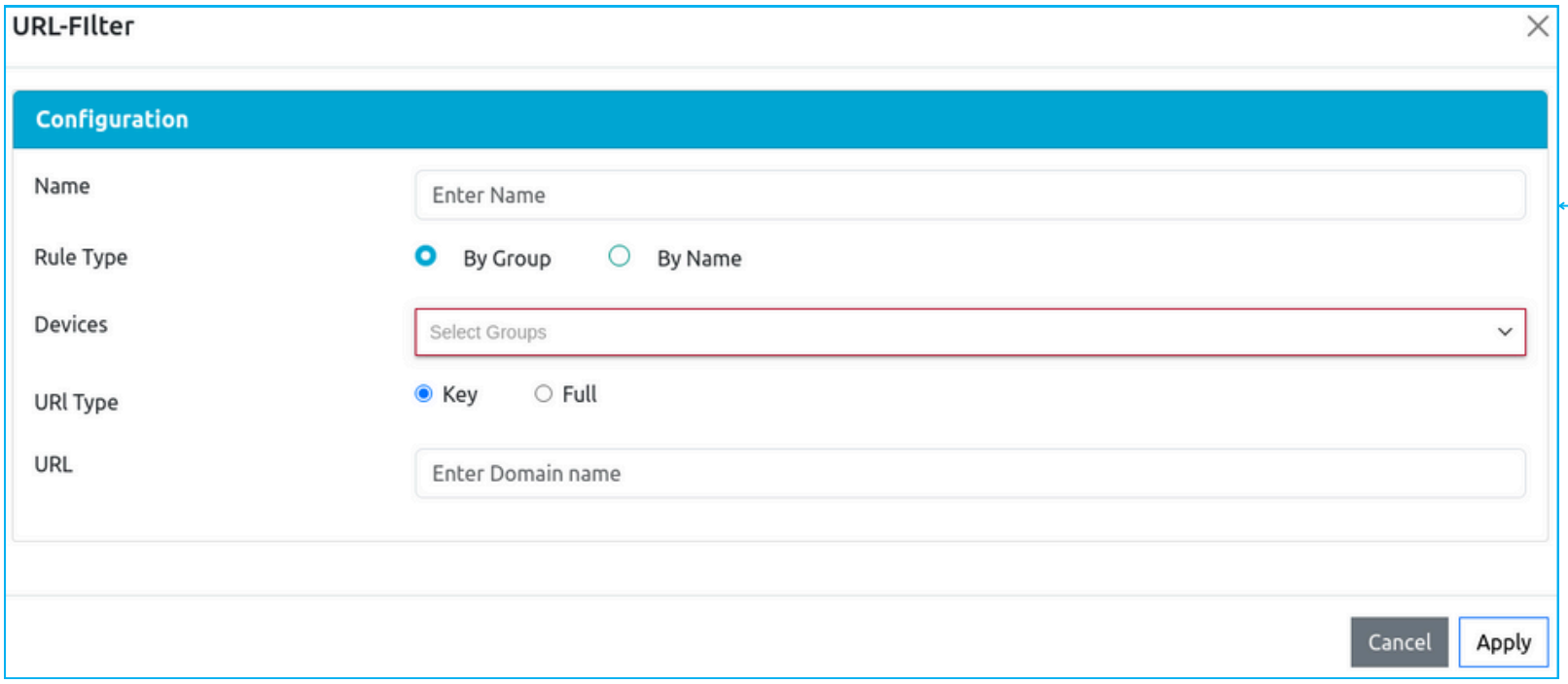
Destination/ System Port: Refer to page no 83

Firewall - URL Filter

Configuration → Firewall → URL Filter



URL filtering is a network security measure that involves controlling or restricting access to specific websites or web resources based on their URLs (Uniform Resource Locators). It's a common approach used to enforce security policies, improve productivity, and protectagainst potential security threats in networks.



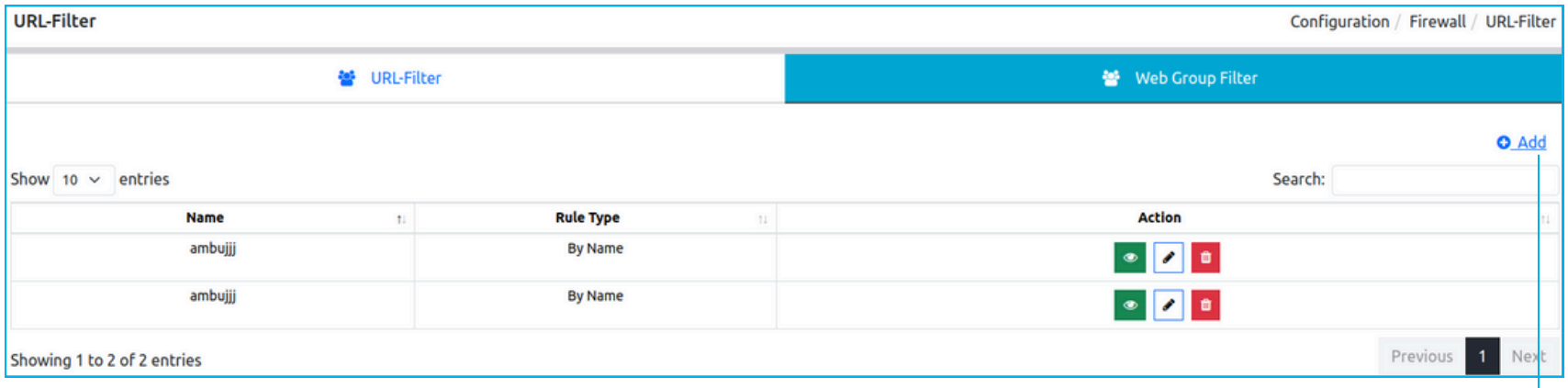
Devices: Select the device group if you selected the Rule type as By Group or select a device group if you selected the Rule type as By Name in which you want add URL Filter.

URL Type: URL type refers to the classification or categorization of URLs (Uniform Resource Locators) based on their content, purpose, or characteristics. URLs can be categorized into various types to help manage, control, and filter access to websites or web resources based on specific criteria. URL categorization is a fundamental component of URL filtering and content filtering systems.

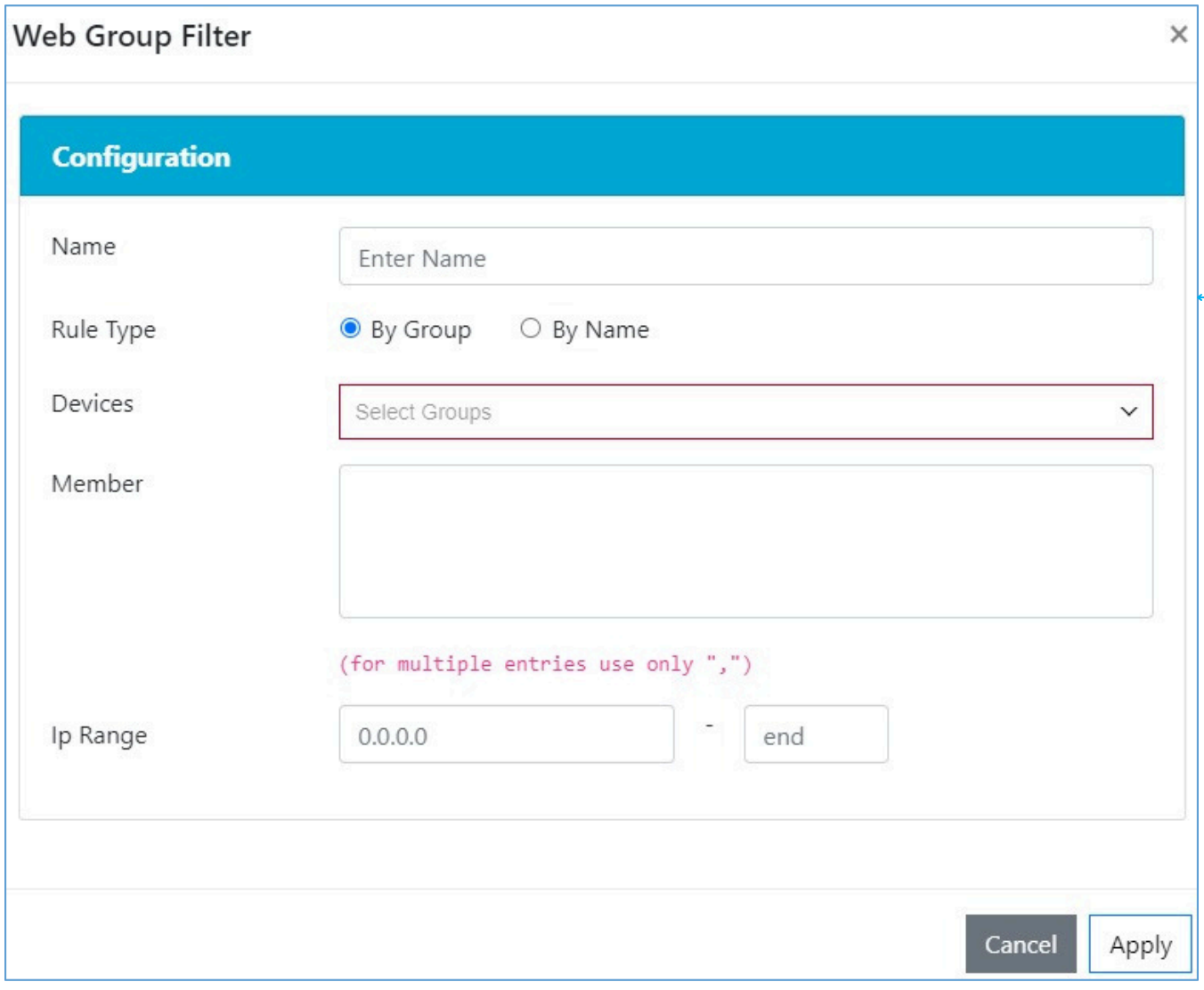
Key URL: Key URL types provide a summarized or high-level categorization of URLs based on their broad content, purpose, or characteristics.

Full URL: Full URL types offer a more detailed and granular categorization of URLs, often including subcategories or more specific classifications.

Configuration → Firewall → URL Filter → Web Group Filter



A web group filter typically refers to a feature or mechanism within network security tools, such as firewalls or web filtering solutions, that allows the categorization and management of websites or web content into groups for easier control and access management. This functionality is commonly used to enforce security policies and improve network productivity.



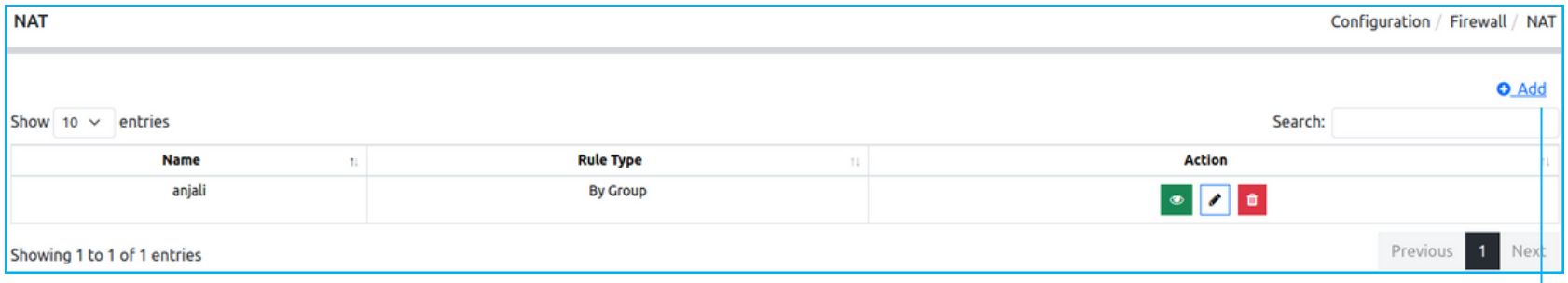
Devices: Select the device group if you selected the Rule type as By Group or select a device name if you selected the Rule type as By Name in which you want add Web GroupFilter.

Member: In Member you have to input the URL or group of URLs those you want to Block. Use coma “ , “ if you input multiple URLs.

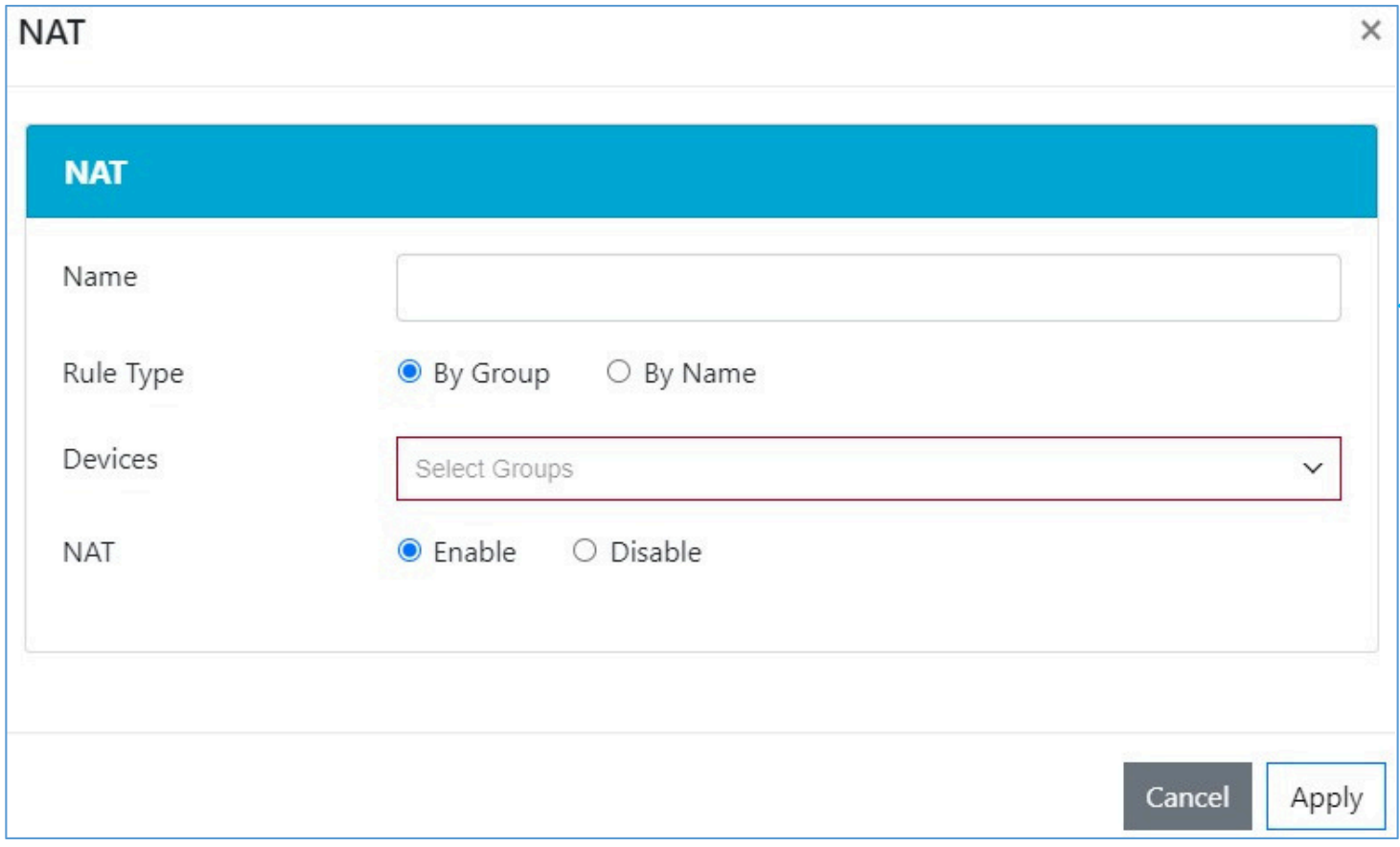
IP Range: An IP range refers to a set of IP addresses or a range of IP addresses that are specified for filtering or controlling access to a web group or specific content on the web. This is a common practice in network and security management to control who can access certain services, websites, or resources based on their IP address. For example, an IP range like "192.168.1.0 -192.168.1.255" includes all the possible IP addresses starting from 192.168.1.0 up to 192.168.1.255 will blocked.

Firewall - NAT

Configuration → Firewall → NAT



NAT, or Network Address Translation, is a crucial component of firewalls and network security. NAT operates at the network layer(Layer 3) of the OSI model and is primarily used to map private IP addresses to public IP addresses. NAT in a firewall is a fundamental tool used to manage and secure communication between a private network and the internet by translating private IP addresses to public IP addresses, thus ensuring efficient and secure data transfer.

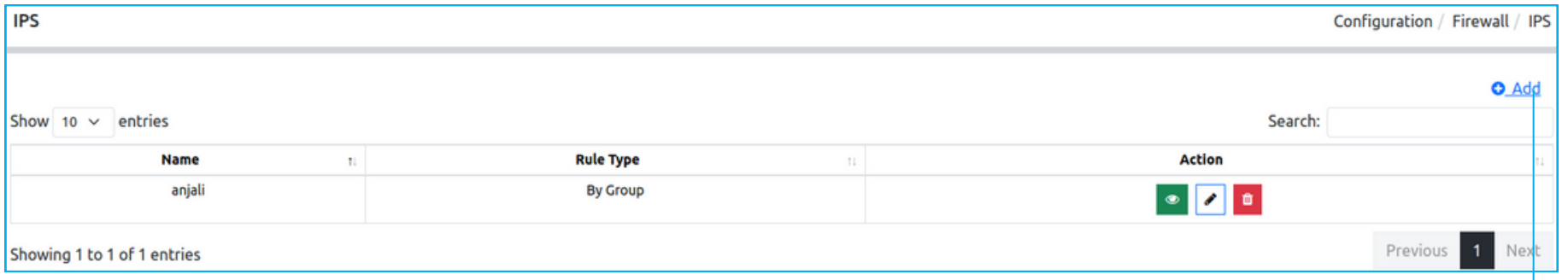


Devices: Select the device group if you selected the Rule type as By Group or select a device name if you selected the Rule type as By Name in which you want add Web GroupFilter.

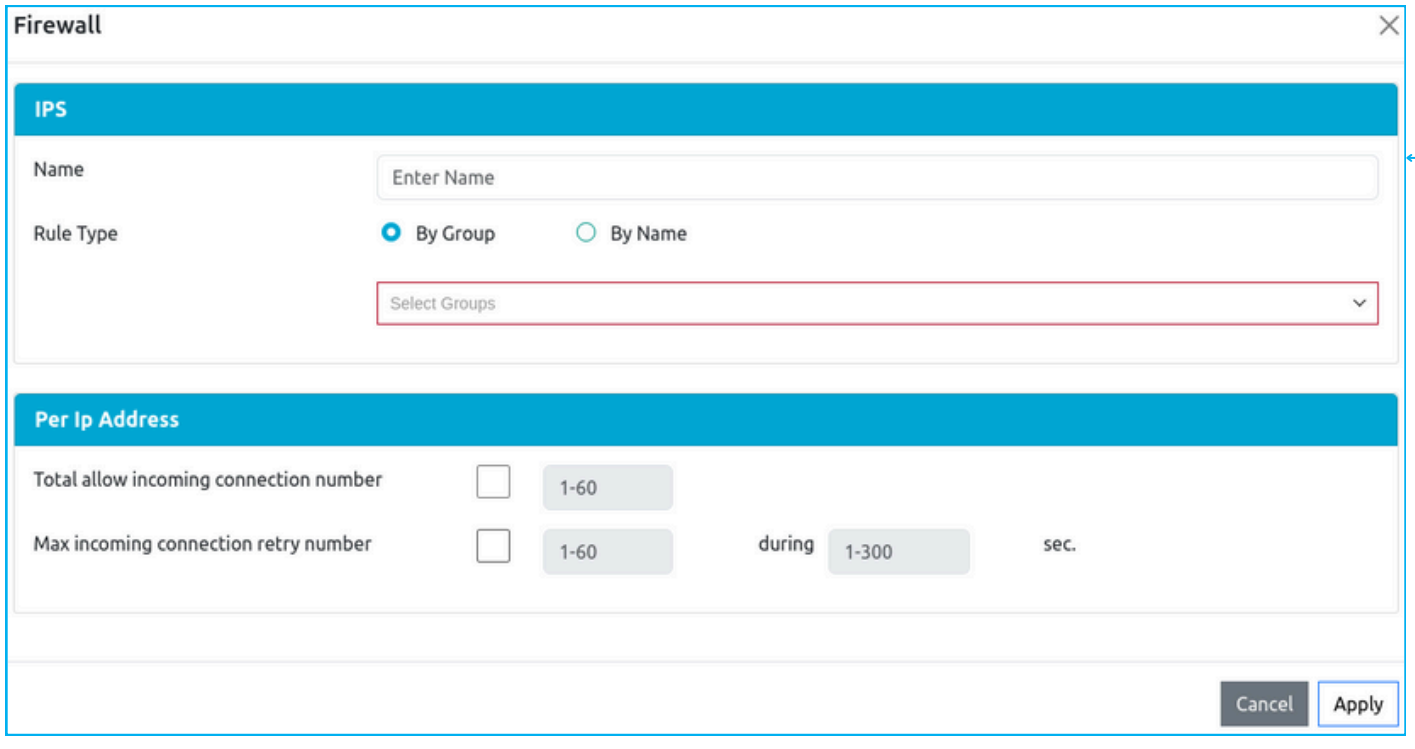
NAT: Enable NAT if you want to apply NAT service to the selected Devices or Disable it if don't .

Firewall - IPS

Configuration → Firewall → IPS



IPS, or Intrusion Prevention System, is an advanced security technology commonly integrated into firewalls. It's designed to detect and prevent malicious activities and attacks in a network. It is like having a security guard at the entrance of your network. It constantly checks who's coming in, verifies their credentials (the network packets), and takes action if it detects anything suspicious or malicious, providingan additional level of security and threat prevention.

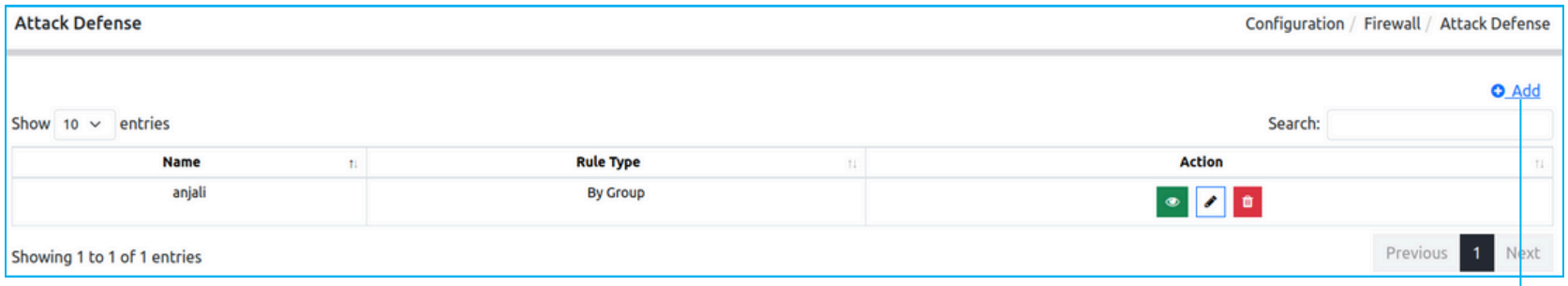


Total Allow incoming connection number: The "Total Allow Incoming Connection Number" refers to the maximum permitted number of incoming connections that are considered safe or allowed based on the security policies and configurations set within the IPS. Enable the check box and input your number between 1 to 60.

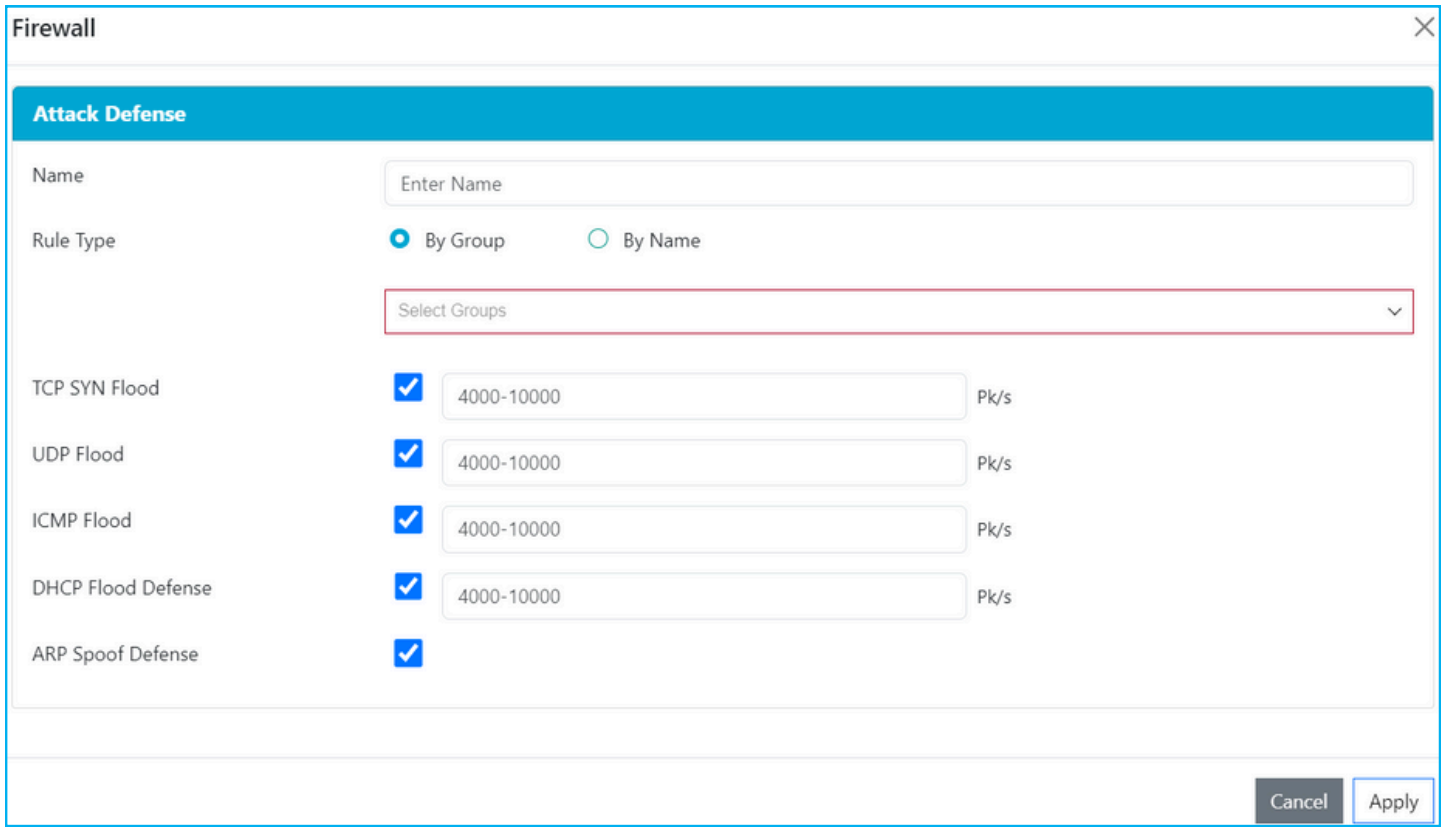
Max incoming connection retry number: The "Max Incoming Connection Retry Number" typically refers to the maximum number of attempts allowed for establishing a connection with a specific service or resource. When a connection attempt fails, the system or application may retry a certain number of times before considering the connection unsuccessful. Enable the check box and input the number and time. The number should be within 1 to 60 and time should be within 1 to 300 Sec.

Firewall - Attack Defense

Configuration → Firewall → Attack Defense



Attack defense refers to strategies, measures, or mechanisms put in place to protect computer systems, networks, and data from various forms of cyber-attacks. It involves safeguarding against unauthorized access, malicious software, data breaches, and other security threats that could compromise the confidentiality, integrity, or availability of digital assets.



TCP SYN flood: A TCP SYN flood is a type of DDoS (Distributed Denial of Service) attack that exploits the TCP protocol's three-way handshake process. Enable the check box and enter the number between 4000 to 10000. For example, if you set the number like 5000 the device will generate an alert when more than 5000 tcppackets per second are coming to device.

UDP flood: A UDP flood attack is a type of DoS(Denial of Service) attack where an attacker floods a target system with a large number of UDP (User Datagram Protocol) packets in a short amount of time. Enable the check box and enter the number between 4000 to 10000. For example, if you set the number like 5000 the device will generate an alert when more than 5000 udp packets per second are coming to device.

ICMP flood: An ICMP (Internet Control Message Protocol) flood attack is a type of DDoS (Distributed Denial of Service) attack where an attacker overwhelms a target system with a high volume of ICMP packets. . Enable the check box and enter the number between 4000 to 10000. For example, if you set the number like 5000 the device will generate an alert when more than 5000 icmppackets per second are coming to device.

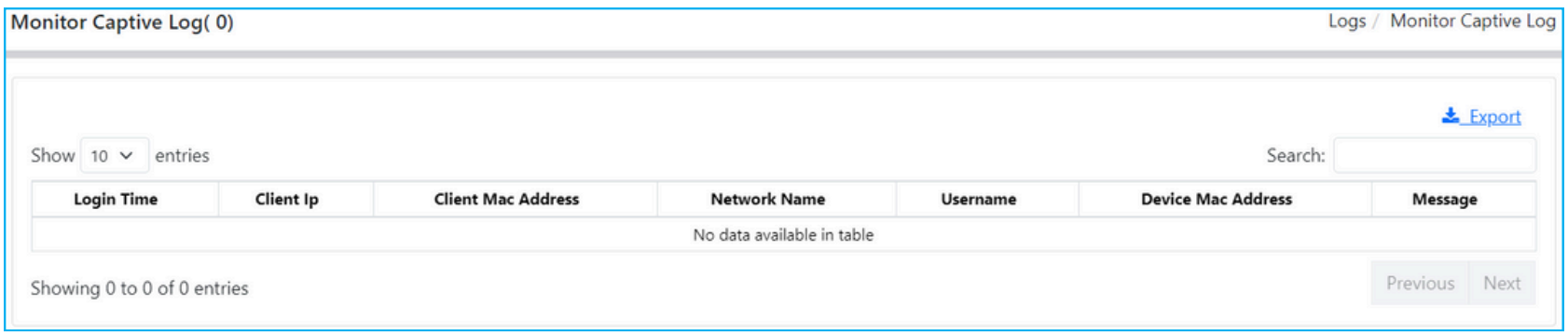
DHCP flood defense: A DHCP (Dynamic Host Configuration Protocol) flood attack involves overwhelming a DHCP server with a high volume of DHCP requests, exhausting its resources and preventing it from serving legitimate client requests. Enable the check box and enter the number between 4000 to 10000. For example, if you set the number like 5000 the device will generate an alert when more than 5000 dhcppackets per second are coming to device.

APR Spoof Defense: ARP (Address Resolution Protocol) spoofing attacks involve manipulating ARP tables to redirect network traffic to an attacker's device. Such attacks can be detrimental, leading to various security breaches and network vulnerabilities. Employing a firewall as part of your defense strategy against ARP spoofing can be effective.

LOGS.....4
User Logs.....4.1
Alarms.....4.2

Logs

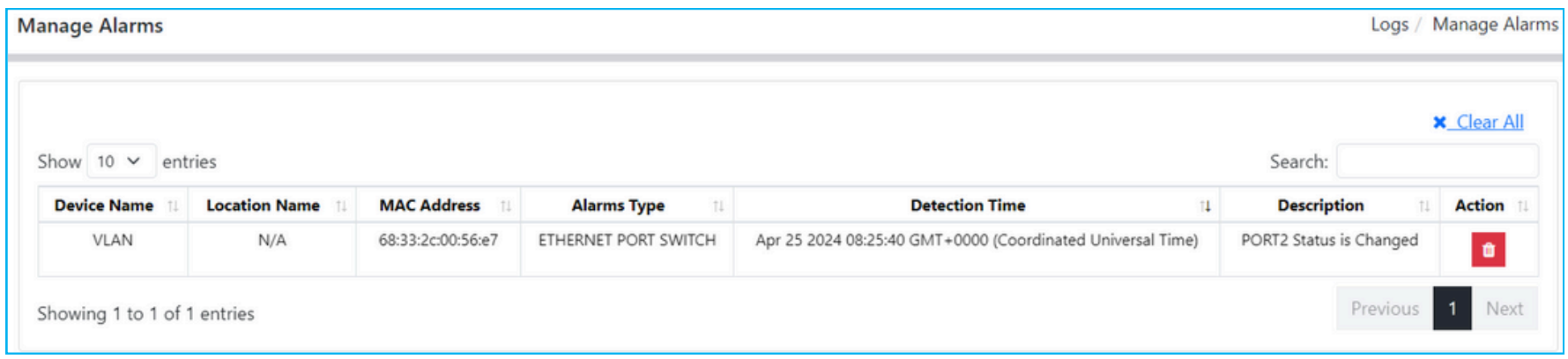
Logs → User Log



In Monitor Captive Log you able to see the Data of all the connected clients. Click Export to export the Data Sheet.

Logs

Logs → Alarms



Alarms in logs are essential for maintaining the health and security of systems. It helps to identify and address problems proactively, reducing downtime, minimizing security risks, and ensuring that critical events do not go unnoticed. If you enable Alarms then it will display the system Vulnerabilities, Device Status(online/ offline) and all the other device logs.

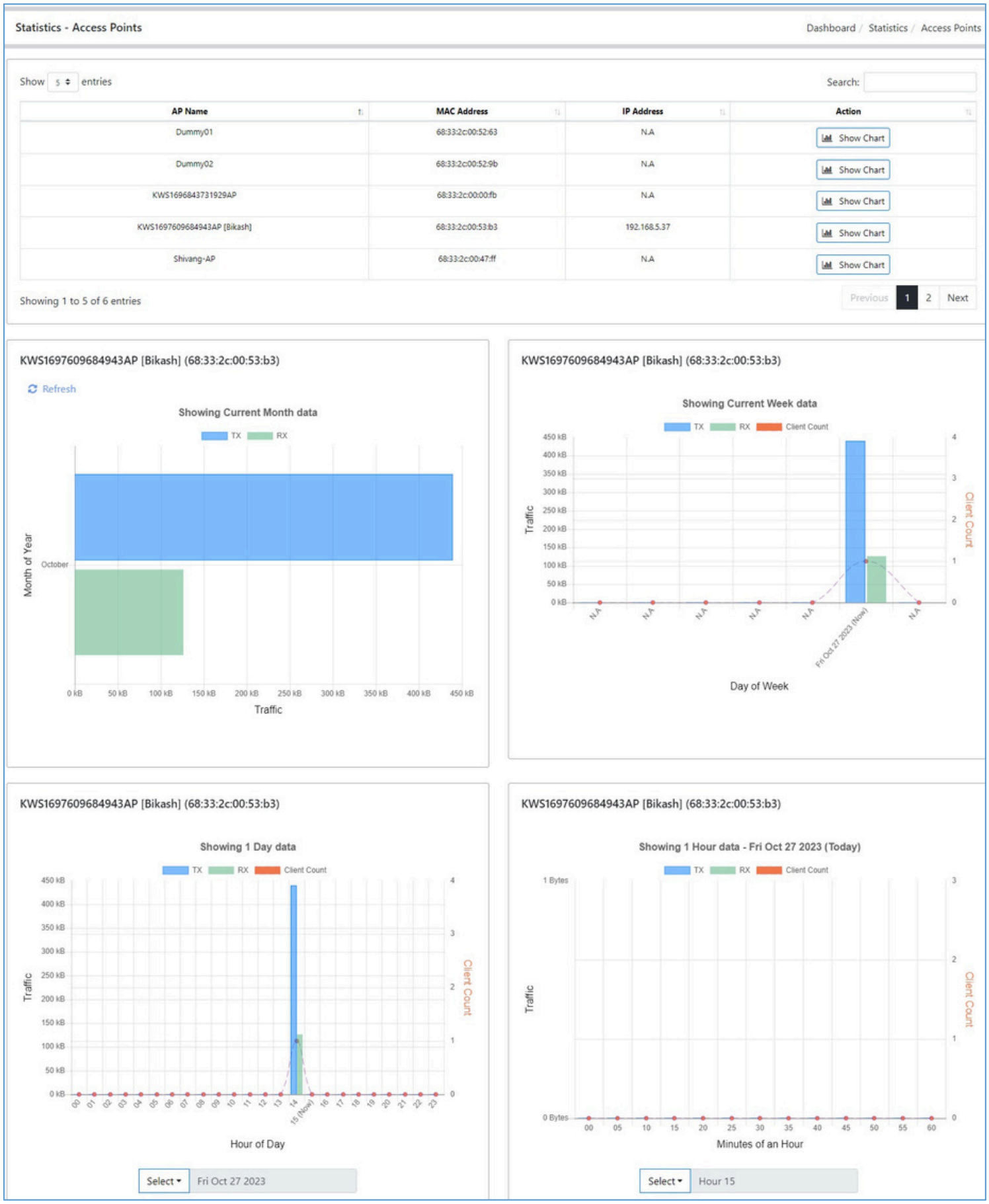
Stats.....5

Access Point.....5.1
Networks.....5.2
Clients.....5.3
Spectrum.....5.4

Stats

Stats → Access Points

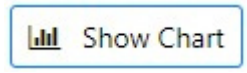
To check the statistics of a particular device click on Show Chart

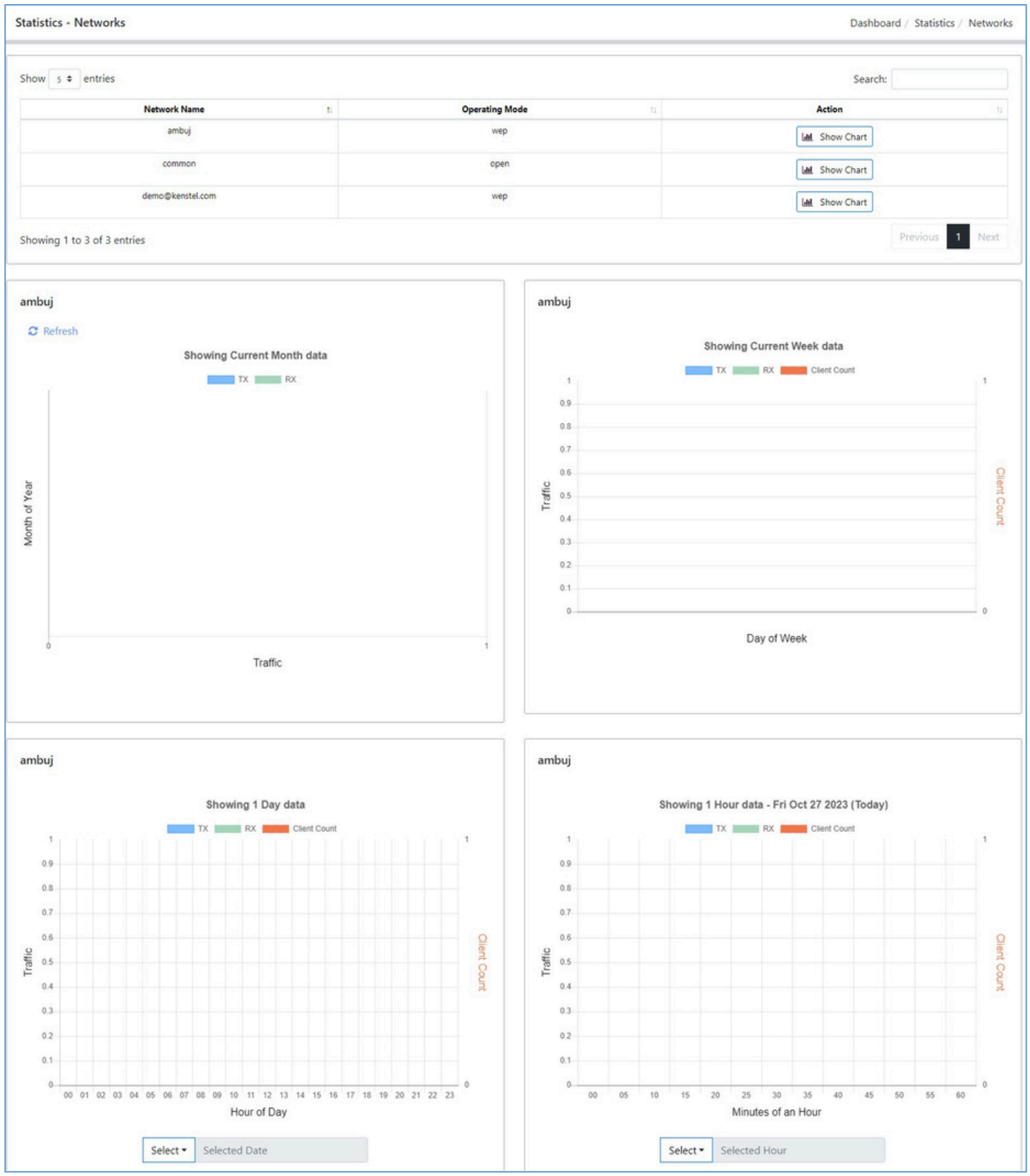


Here, you can check your device's statistics, such as how much data it consumes in an hour, a day, a week, or a month.

Stats

Stats → Networks

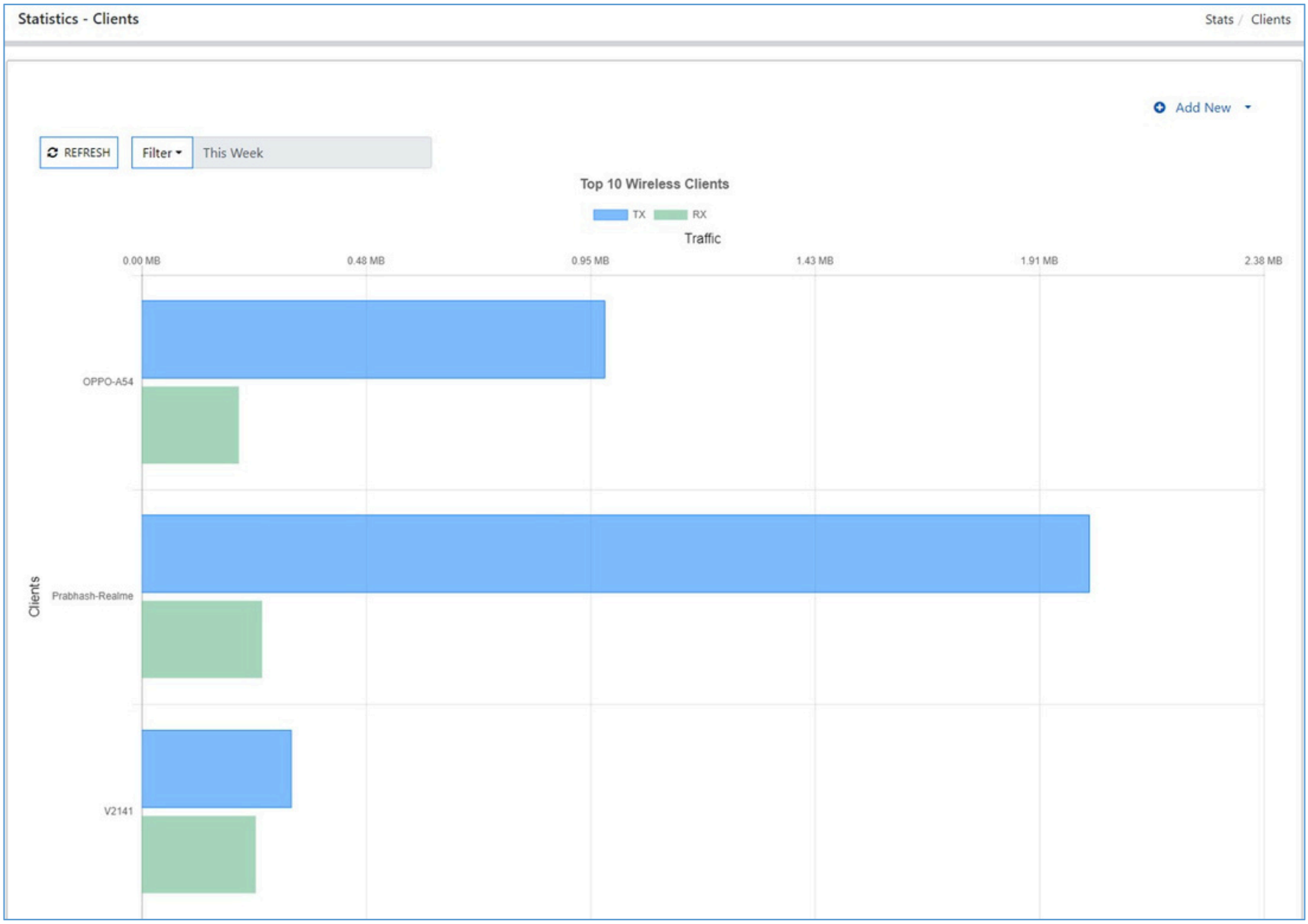
To check the statistics of a particular network click on 



Here, you can check your network's statistics, such as how much data it consumes in an hour, a day, a week, or a month.

Stats

Stats → Clients

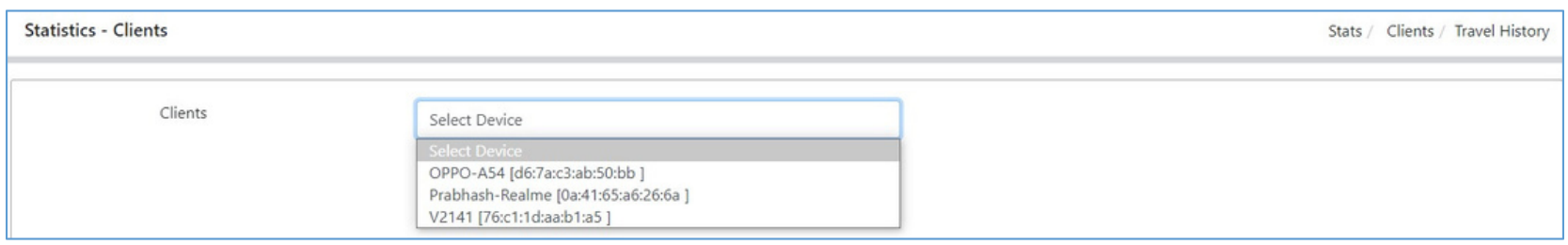


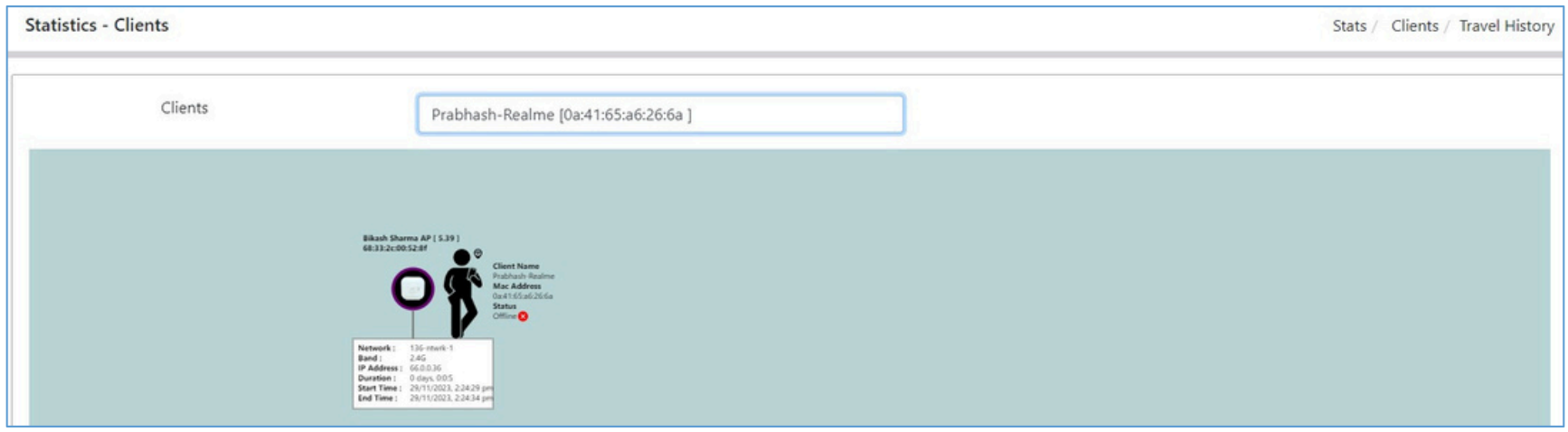
Clients are the devices connected to a specific network. Here, you can check the clients' statistics, including download and upload data consumption.

Stats

To check the client's history click on

Stats → Clients → Add New → Client Travel History

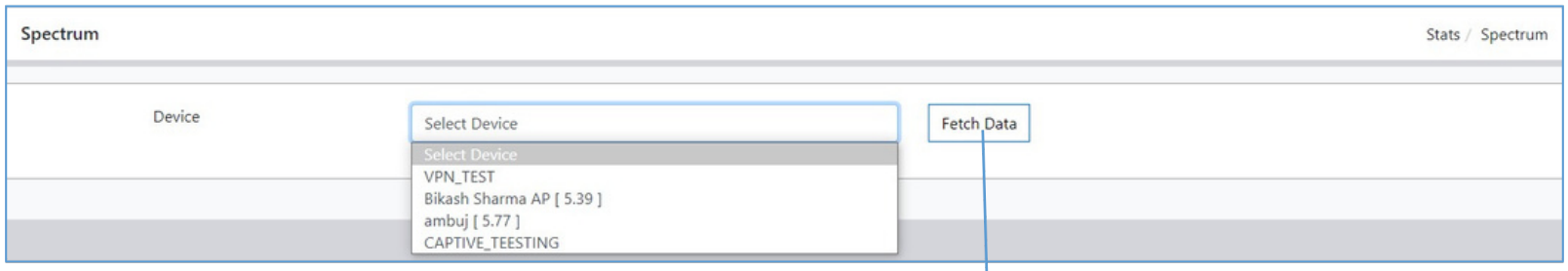




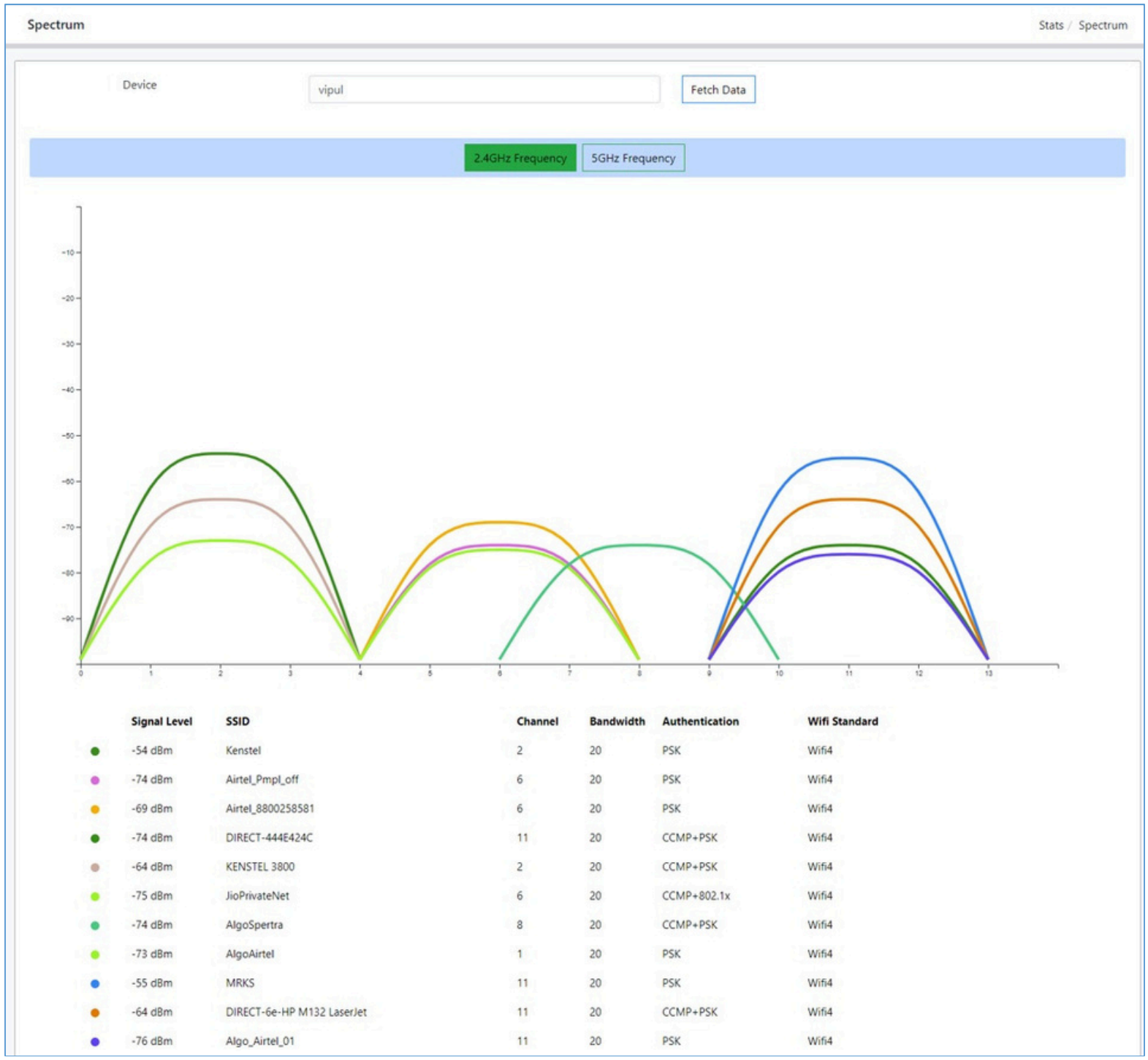
Here you can check the data history of a client.

Stats

Stats → Spectrum



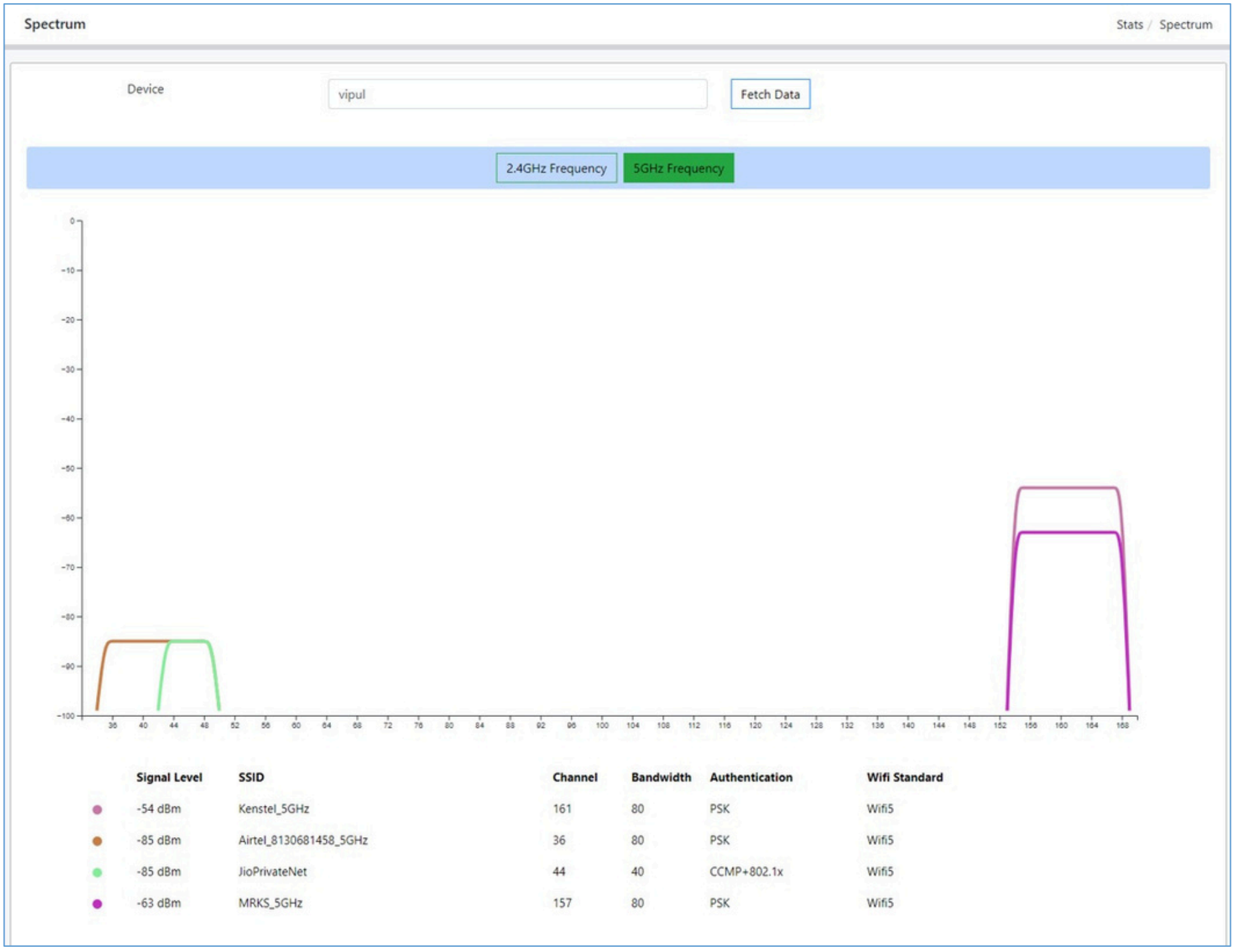
Select device and click on Fetch data



Signal Level	SSID	Channel	Bandwidth	Authentication	Wifi Standard
-54 dBm	Kenstel	2	20	PSK	Wifi4
-74 dBm	Airtel_Pmpl_off	6	20	PSK	Wifi4
-69 dBm	Airtel_8800258581	6	20	PSK	Wifi4
-74 dBm	DIRECT-444E424C	11	20	CCMP+PSK	Wifi4
-64 dBm	KENSTEL 3800	2	20	CCMP+PSK	Wifi4
-75 dBm	JioPrivateNet	6	20	CCMP+802.1x	Wifi4
-74 dBm	AlgoSpertra	8	20	CCMP+PSK	Wifi4
-73 dBm	AlgoAirtel	1	20	PSK	Wifi4
-55 dBm	MRKS	11	20	PSK	Wifi4
-64 dBm	DIRECT-6e-HP M132 LaserJet	11	20	CCMP+PSK	Wifi4
-76 dBm	Algo_Airtel_01	11	20	PSK	Wifi4

Here you able to see the statistics of the nearby devices. You can check the stats in 2.4 GHz as well as in 5 GHz. These are the stats of 2.4 GHz

Stats

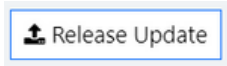


These are the stats of 5 GHz

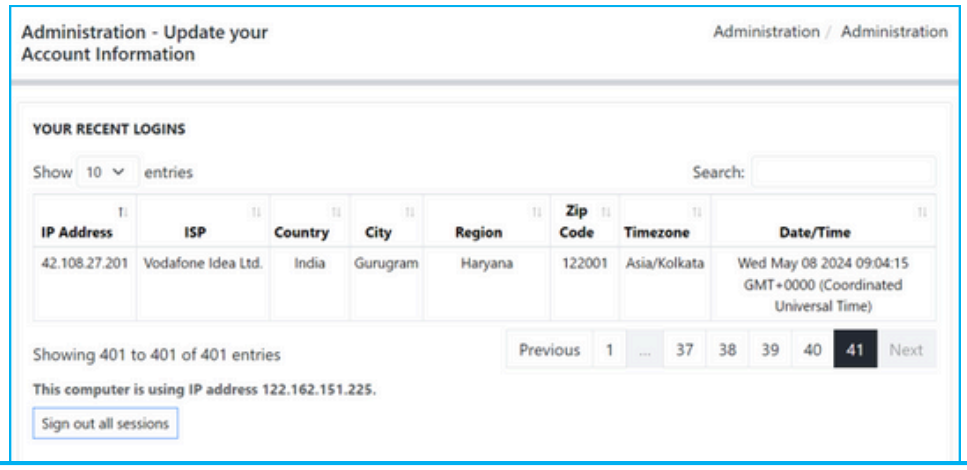
Update.....6

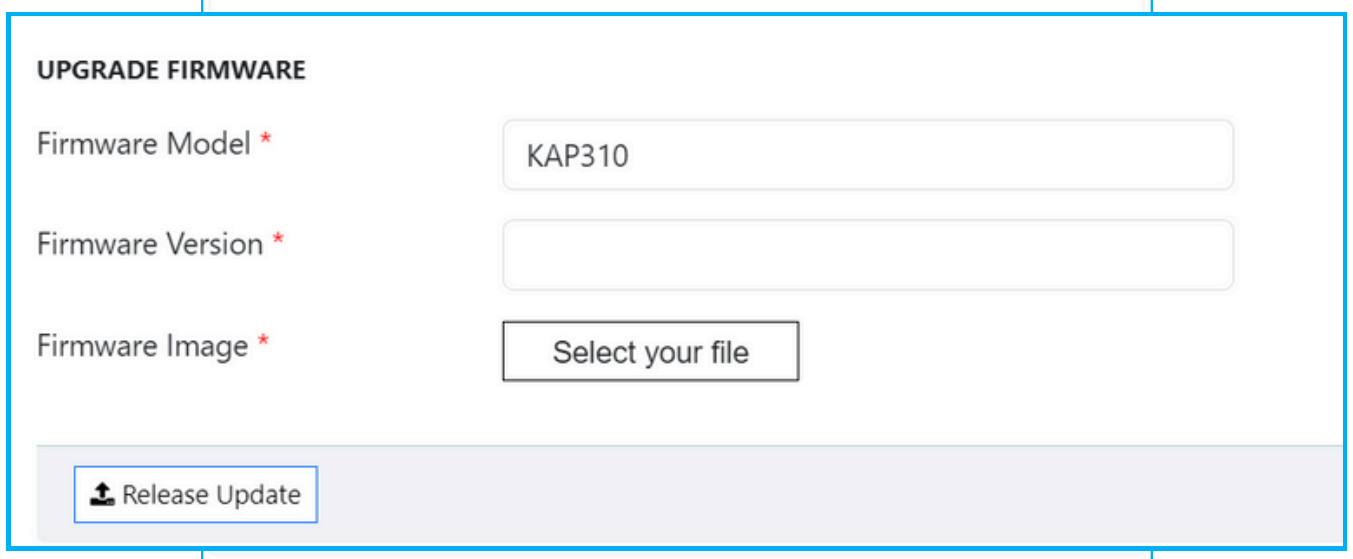
Update

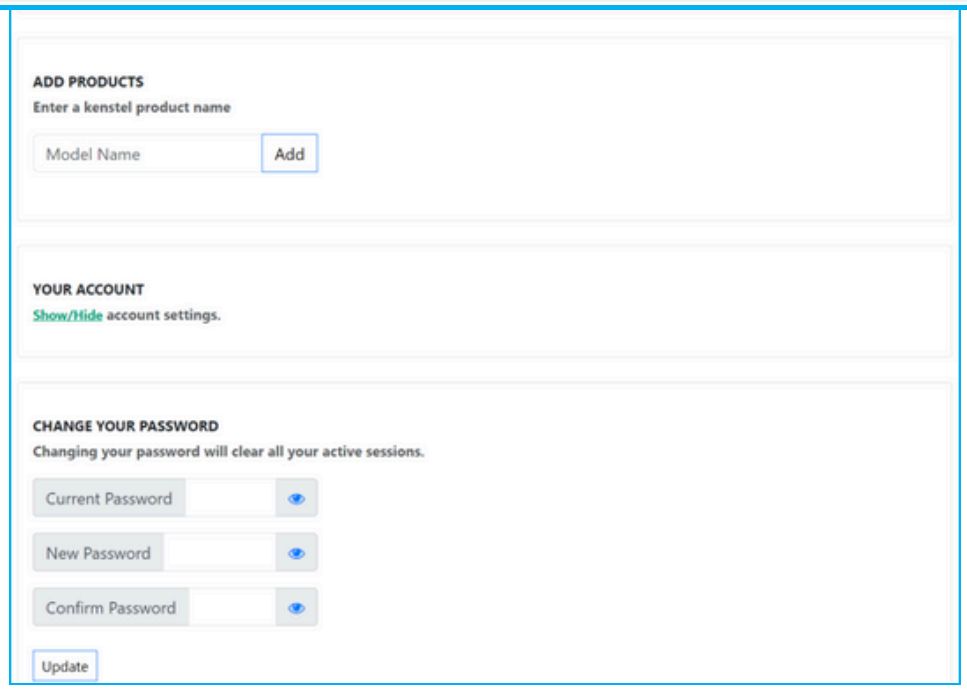
To Update firmware, firstly go to administration page then select Firmware Model, Firmware Version and Firmware Image (you can choose your image file from your gallery) then click on



Button.

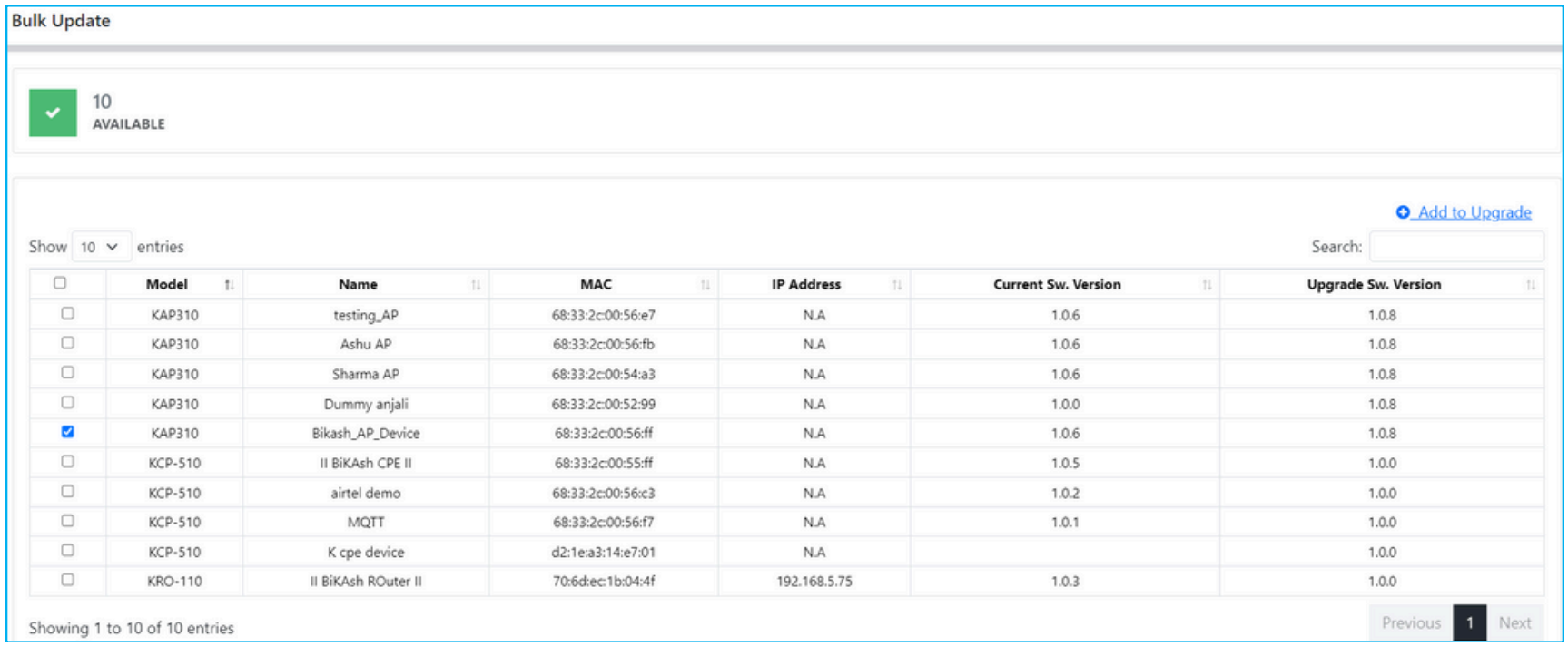






Update

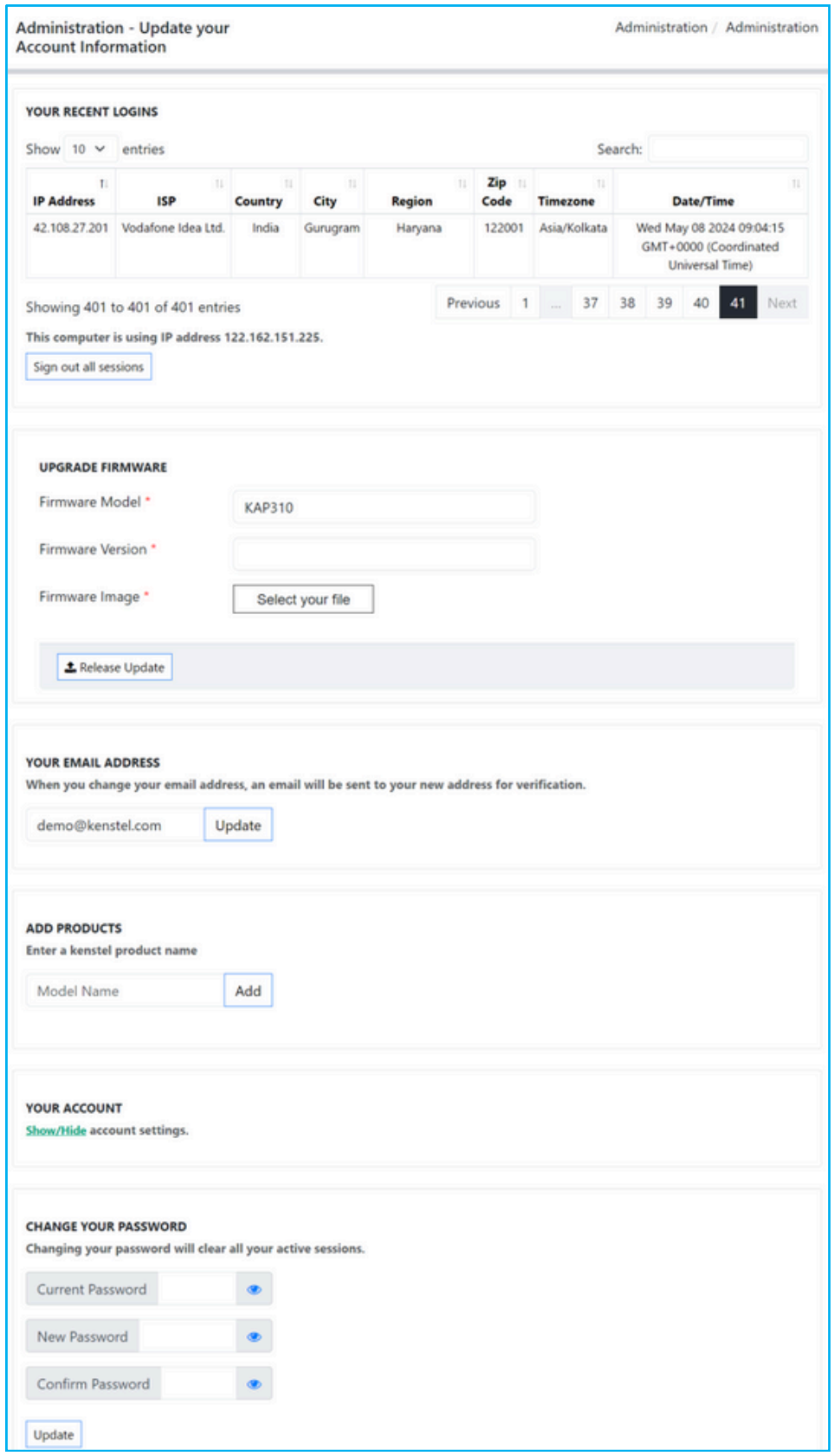
After Release Update, go to **Updates** → Bulk Update then Select your device and Click Add to Upgrade to update and then OK.



Administration.....7
Administration.....7.1
Add Manager 7.2
Configuration Management.....7.3

Administration

For Administration page, go to administration → Administration



On this Administration page, you are able to see the details of all the clients connected to the cloud.

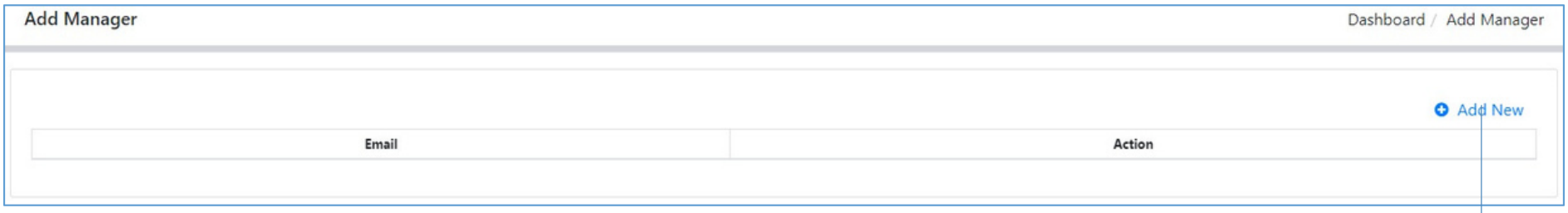
Click on Sign out all sessions for Sign out all the clients

Here you can update your Account, Email ID, Firmware and Password.

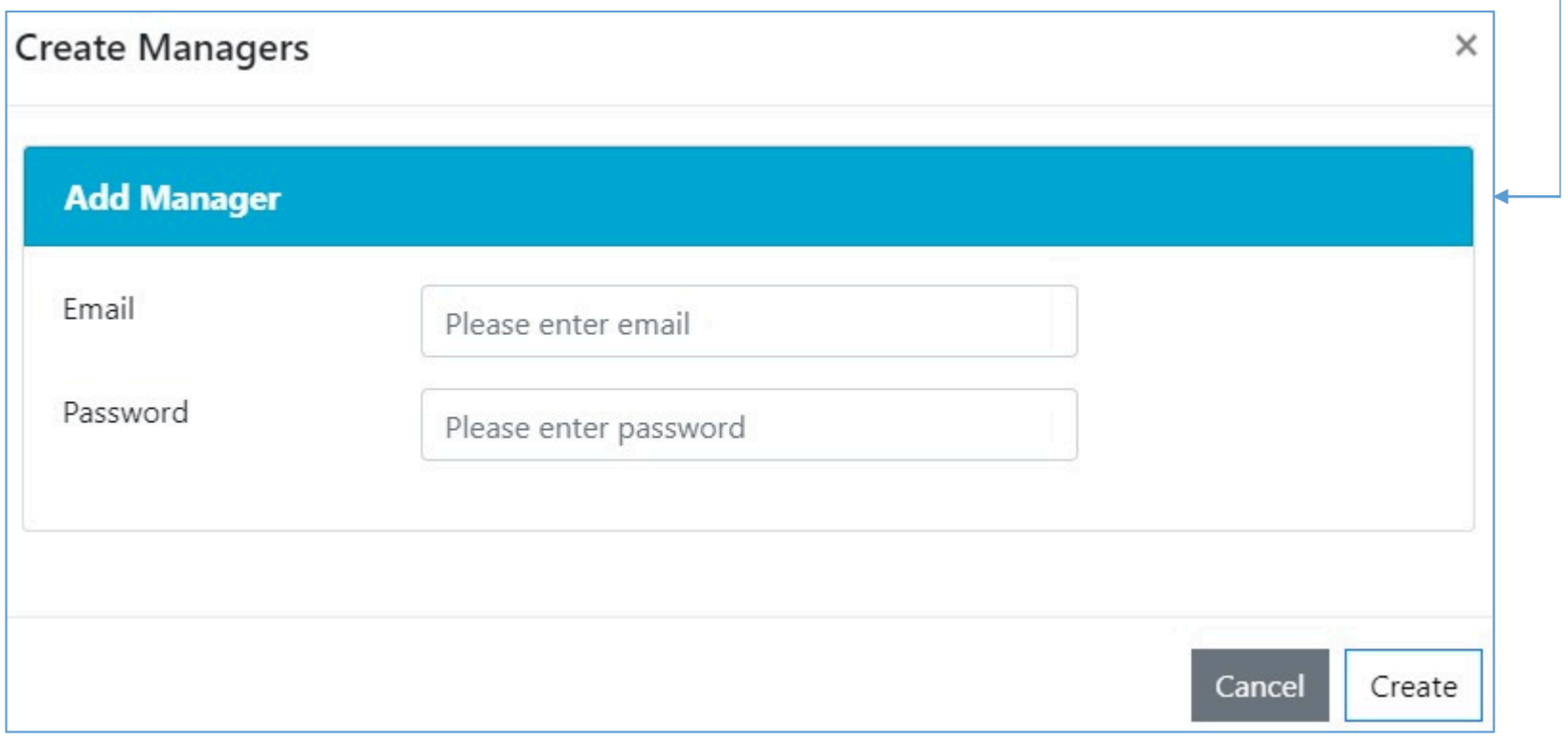
Note: Kindly read the instructions carefully while updating .

Administration

Administration → Add Manager



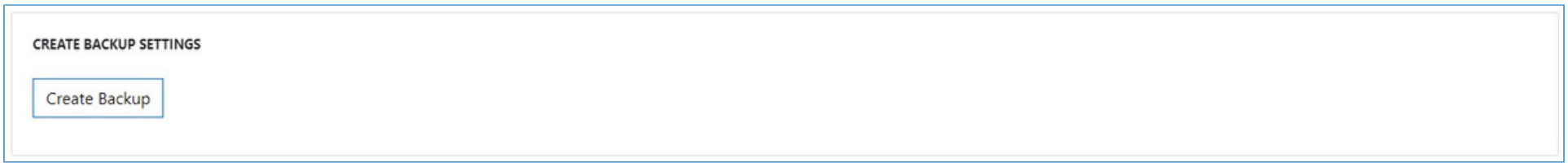
Here you get an overview of Manager.



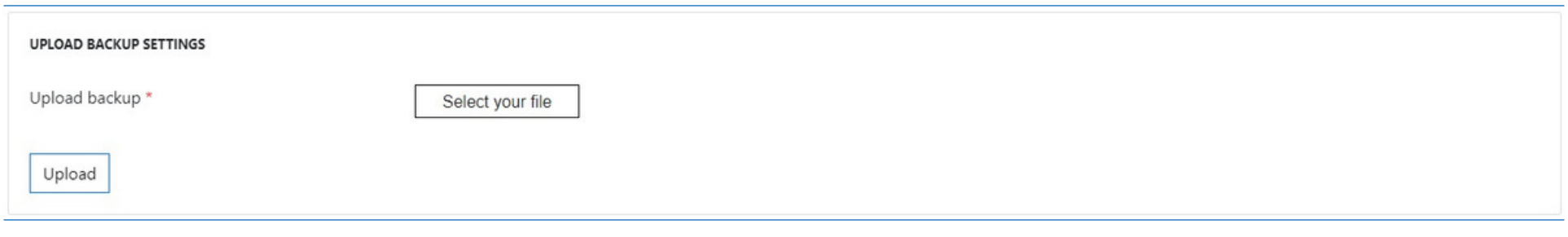
Input the credentials and click on create. With this email and password you can login to the cloud.

Administration

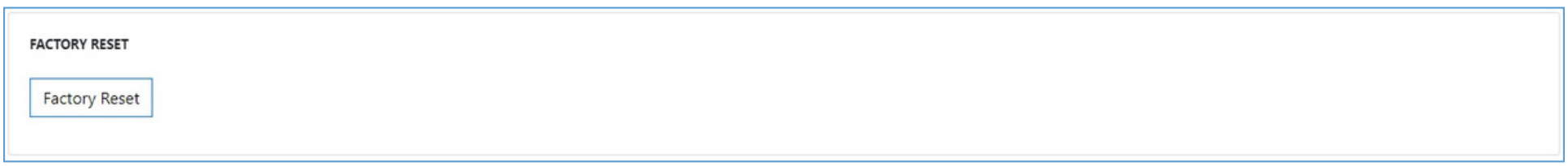
Administration → Configuration Management



Click on Create Backup for a backup file of the configuration



Select the downloaded backup file and click on UploadButton to Upload.



Click on Factory Reset to reboot the cloud .