QUANTUM NETWORKS

QUANTUM RUDDER®
Network and Services Controller

SWITCH CONFIGURATION USER GUIDE

Copyright Information

Document Abstract

This document explains how to Configure and Manage Switches with Quantum Rudder (Quantum Networks' Cloud Controller).

Supported Models

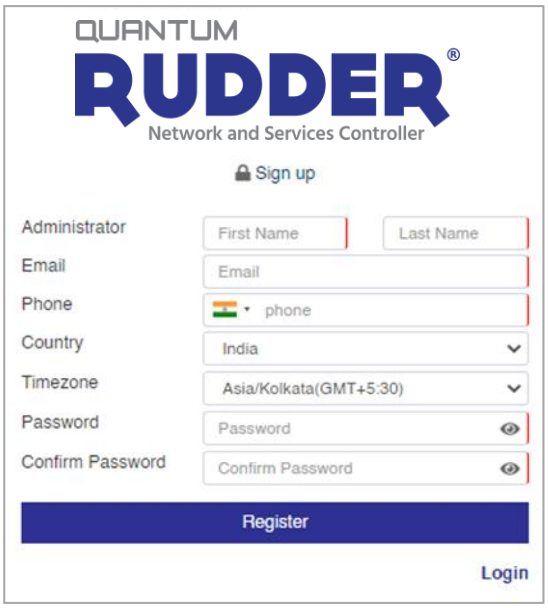
The guide supports the following listed models:

Model Series	Type
QN-CS-4810GF	Core Switch
QN-CS-1610GF	Core Switch
QN-CS-2410GF	Core Switch
QN-CS-241GF	Core Switch
QN-SW-225 Series	Enterprise Switches
QN-SW-230 Series	Enterprise Switches
QN-SW-325 Series	Enterprise Switches
QN-SW-330 Series	Enterprise Switches
QN-SW-425 Series	Enterprise Switches
QN-SW-430 Series	Enterprise Switches
QN-IS-225 Series	Industrial Switches
QN-IS-220 Series	Industrial Switches

Contents

Account Setup on Quantum Rudder

- Browse https://rudder.qntmnet.com.
- Click “Create New Account” to sign up for a new account.

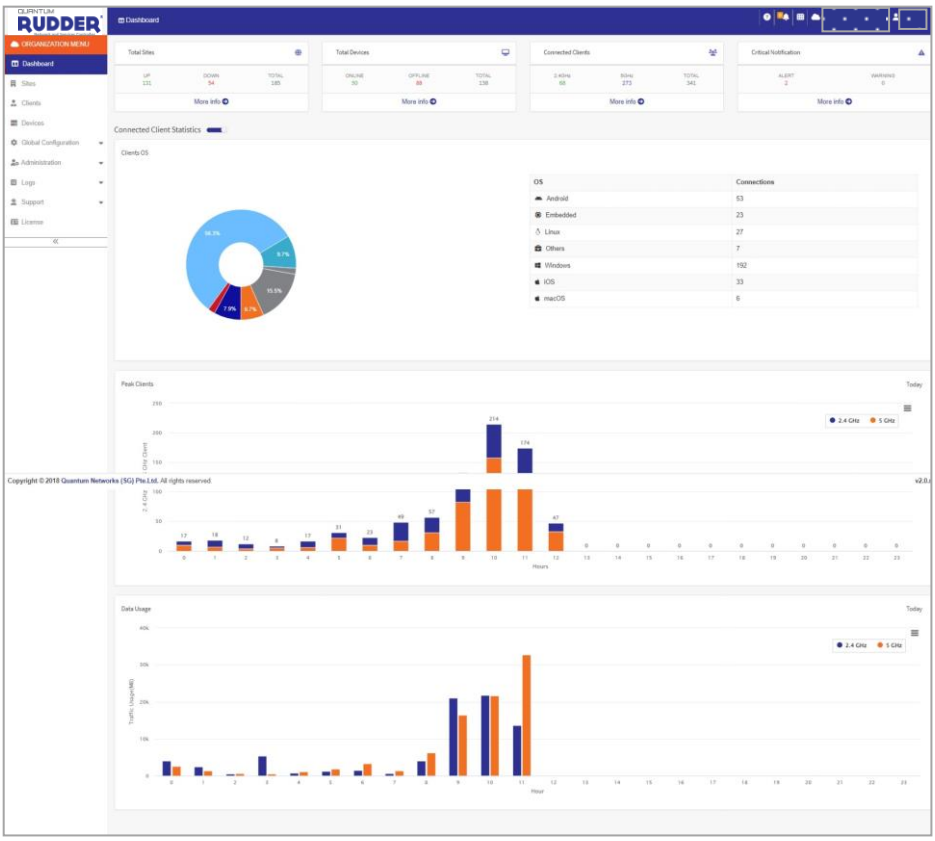


- Follow the steps as guided on the screen for Registration.
- Verify Quantum Rudder account from registered Email ID.
- Once the account gets validated, it turns the page to “Add License Key” (User will get the license key from the respective (Partner / Resource).
- Account on Quantum Rudder (Quantum Networks’ Cloud Controller) is now ready to use.

Login to Quantum Rudder Web Interface

- Go to https://rudder.qntmnet.com
- Enter credentials and click Login.

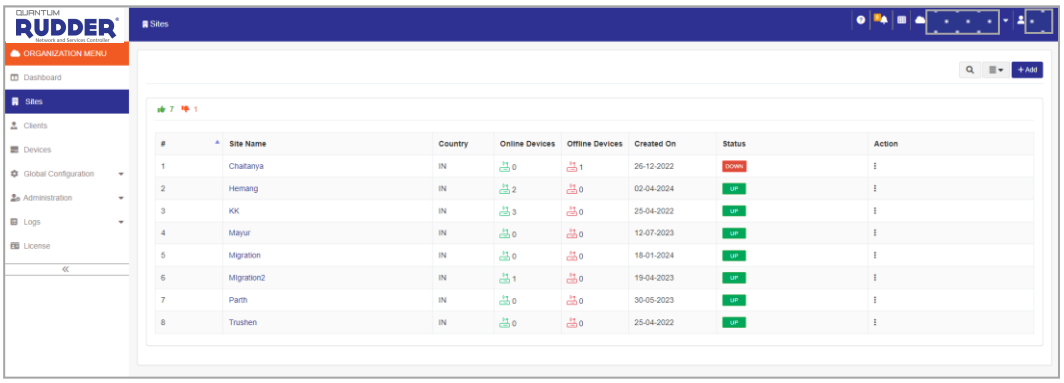
- Successful log-in redirects to the Quantum Rudder dashboard.



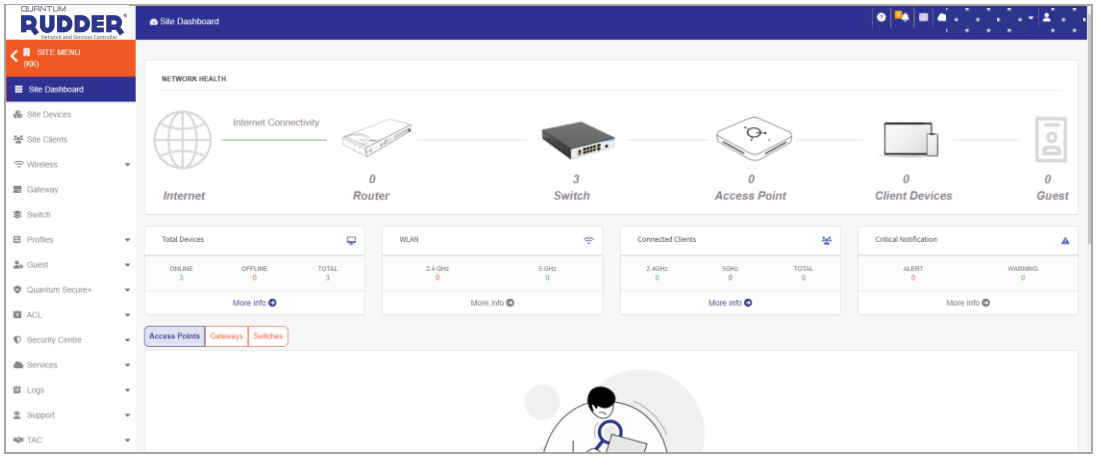
Upon successful login, users are redirected to the Quantum Rudder dashboard. The main screen allows the admin to perform various tasks. The top panel provides options for "Critical Alerts," "Edit Current Cloud," and managing "Cloud Admin" features.

Cloud Dashboard

From the left panel, select the "Site" option. All the created sites will be displayed on the dashboard.

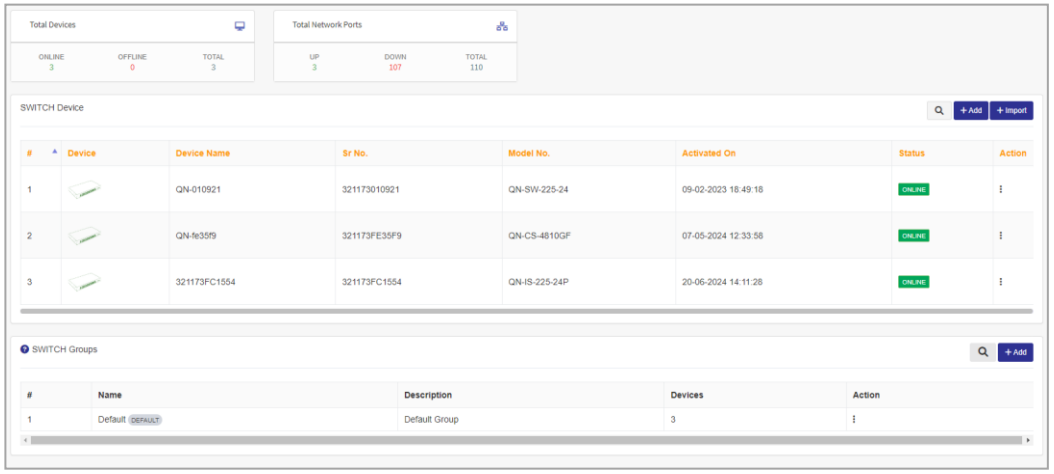


Click on the "Site Name" where the switch needs to be added. Users will be redirected to the selected site's configuration page.



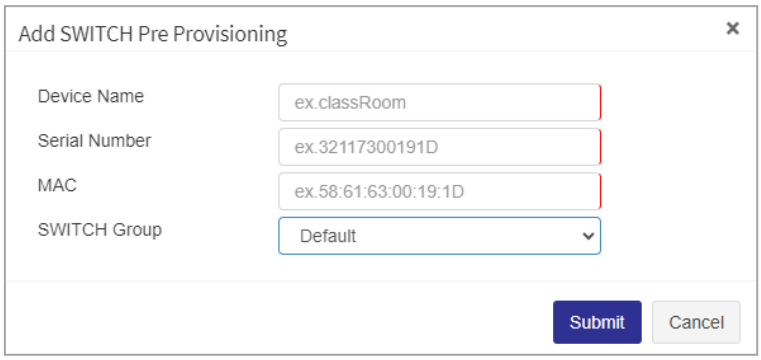
Click on "Switch" to be redirected to the switch configuration page.

All the added switches will be displayed here, allowing users to update their configurations or add new switches.



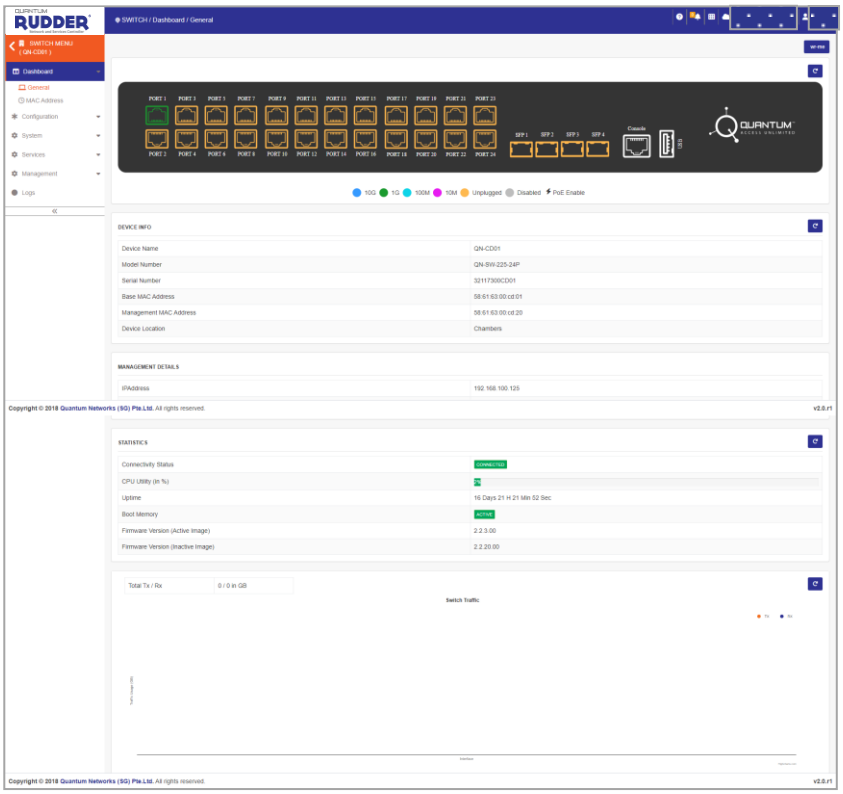
Click on "Add" to add a new switch. A pop-up screen shown below will come up where you can add a new switch.

Add the device name, switch serial number and MAC address. Select the switch group from the dropdown menu if pre-configured in the cloud. For the first switch, select the "Default" group.



Dashboard

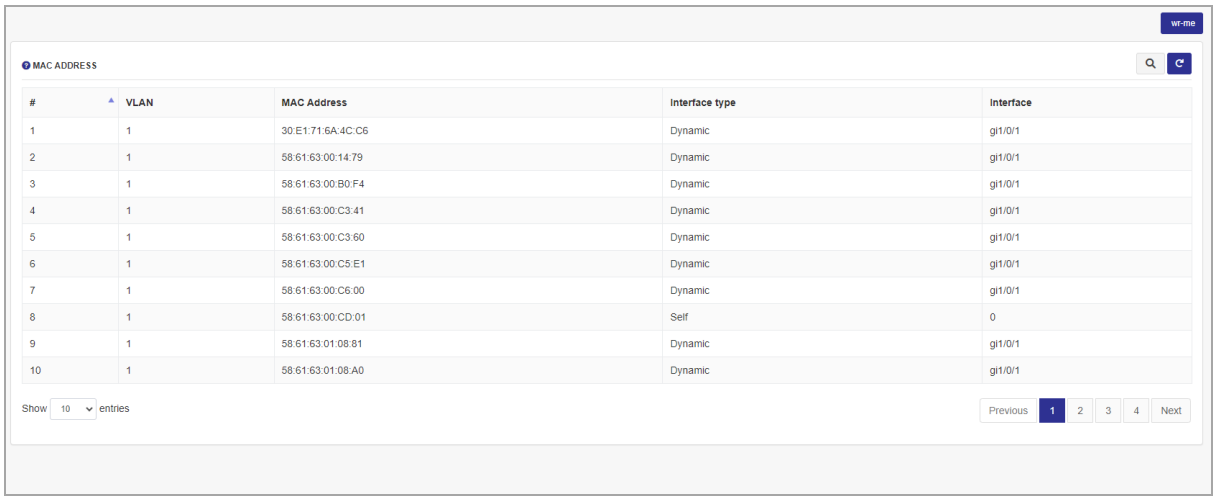
General



The main dashboard collects all switch device information, including the name, model with serial number and MAC address, management MAC address, device location, assigned IP address and switch statistics.

MAC Address

The MAC address table is where the switch stores information about devices connected to the network through its Ethernet ports.



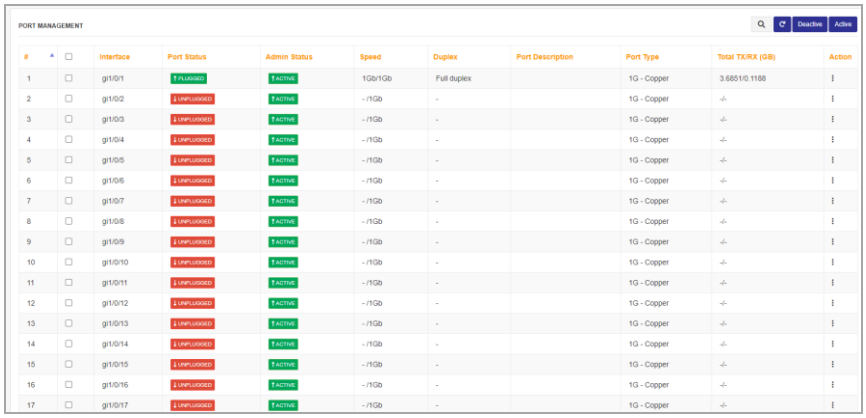
Configuration

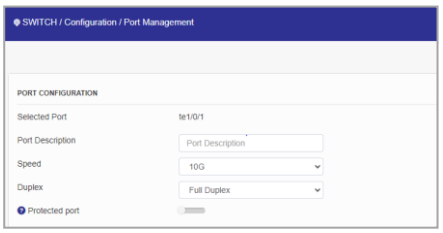
Devices

PARAMETERS	DESCRIPTION	DEFAULT VALUE	REMARKS
Device Name	Enter device name of your choice	None	None
Device Location	Enter location detail	None	None
Jumbo Frame	Enable jumbo frame, as per your requirement	Disable	Jumbo frames are Ethernet frames with a payload size over 1500 bytes, the MTU set by IEEE 802.3. Their maximum size is 9000 bytes.
SSH	Enable SSH for establish secure connection	Disable	The Secure Shell Protocol (SSH) is a cryptographic network protocol for secure access to network devices. It ensures communication security and integrity through strong encryption. This SSH option functions only for the data plane

Port Management

Users can manage all ports from this section. They can activate or deactivate ports and use the action option to edit and update port descriptions, set port speed, adjust duplex parameters and enable or disable port protection status.





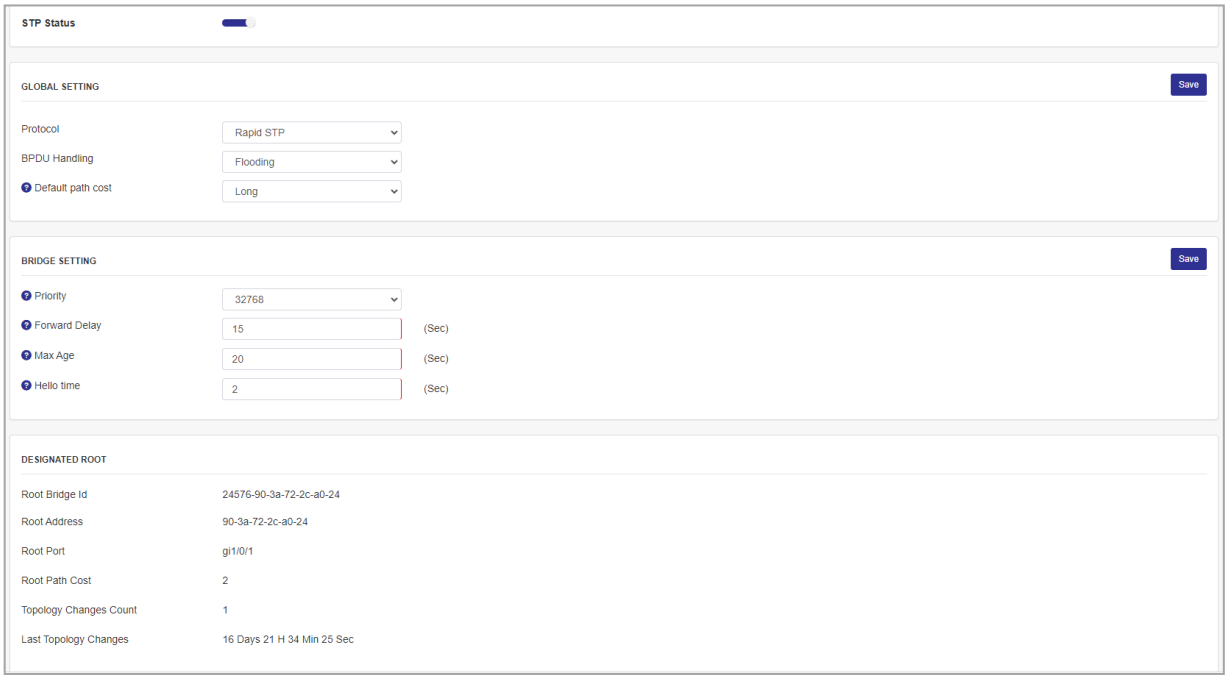
PARAMETERS	DESCRIPTION
Port Number	Will display port number count
	Port selection box
Interface	Will display Interface (port) detail
Port Status	Displays the status of the port, indicating whether it is in use or free – i.e. Plugged or Unplugged
Admin Status	Displays the status of the port, indicating whether it is active or inactive
Speed	Indicates the configured port speed
Duplex	Indicates the configured Duplex status
Port Description	Displays the port description if specified by the user during configuration
Port Type	Displays the port type, indicating whether it is Copper or Fiber
Total TX/RX (GB)	Displays the port total transmit/ receive (in GBPS)
Action	Option with that user can edit port configuration

Port Configuration

PARAMETERS	DESCRIPTION	REMARKS
Selected Port	Will display selected port	
Port Description	User can add remarks for their reference (Optional)	
Speed	Set the respective port speed with selecting options from dropdown	
Duplex	Set port communication mode	Duplex parameter refers to the mode of communication between network devices, specifying how data transmission occurs. it can be **Half-Duplex:** In this mode, data transmission can occur in both directions, but not simultaneously. **Full-Duplex:** In this mode, data transmission can occur simultaneously in both directions.
Protected Port	Enable / Disable as per the requirement	To enhances network security and control by preventing certain ports from communicating directly with each other. This mode is particularly useful in environments where isolation between devices is necessary.

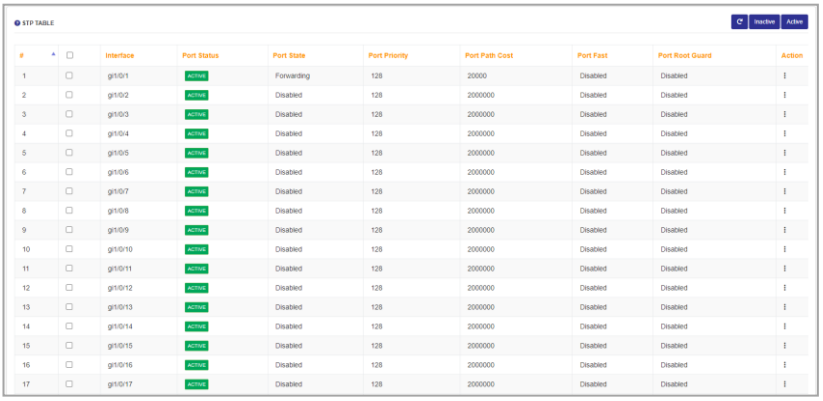
STP

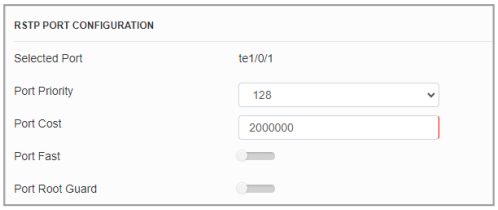
Global Setting



PARAMETERS	DESCRIPTION	DEFAULT VALUE	REMARKS
GLOBAL SETTING			
Protocol	Select RSTP / Classic STP	RSTP	Classic STP (Spanning Tree Protocol) is a network protocol used to prevent loops in Ethernet networks by creating a spanning tree. Rapid Spanning Tree Protocol (RSTP) is an enhancement of the classic Spanning Tree Protocol (STP) designed for faster convergence and improved network stability.
BPDU Handling	Select flooding / filtering	flooding	Flooding is forwarded out all other ports. Filtering is not sent or received on the port.
Default Path Cost	Set Long / Short	Long	STP uses path cost as the metric to calculate the shortest path for electing the root port to reach the root bridge. In short mode, the path cost uses a 16-bit value, while in long mode, it uses a 32-bit value.
BRIDGE SETTING			
Priority	Set priority between 0 to 61440	32768 seconds	The root bridge in spanning tree protocol (STP) is identified based on the switch with the lowest value, indicating the highest priority.
Forward Delay (Sec)	Set Forward Delay between 4 to 30	15 seconds	The time a port waits before transitioning from STP learning and listening states to forwarding state is set in seconds.
Max Age	Set Max Age between 6 to 40	20 seconds	The time a switch waits without receiving STP configuration messages before attempting a reconfiguration is set in seconds.
Hello time (Sec)	Set Hello time between 2 to 20	2 seconds	The interval between STP configuration messages is set in seconds.

STP Table





STP is crafted to avert layer-2 loops by blocking certain ports on switches with redundant links, thus preventing broadcast storms. It allows for redundant links between switches, ensuring network redundancy.

PARAMETERS	DESCRIPTION
Port Number	Will display port number count
	Port selection box
Interface	Will display Interface (port) detail
Port Status	Displays the status of the port, indicating whether it is Active or Deactivate
Port State	Will display port is on disable state or forwarding state.
Port Priority	Will display port priority.
Port Path Cost	Will display port path cost.
Port Fast	Will display port fast enable / disable.
Port Root Guard	Will display port root guard enable / disable.
Action	Option with that user can edit RSTP port configuration

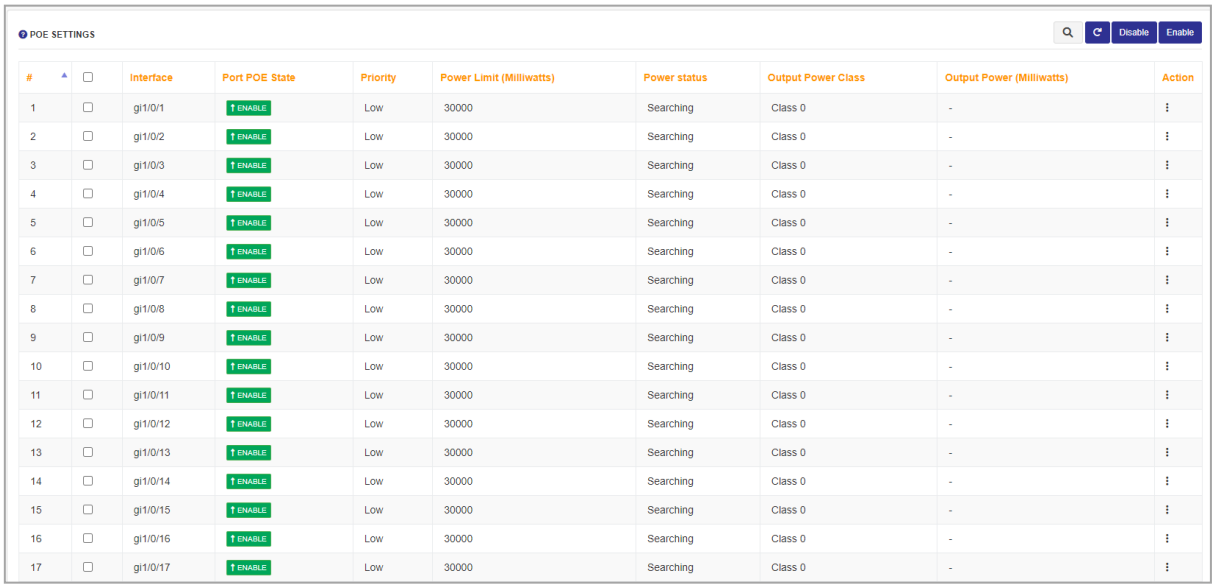
Port Configuration

PARAMETERS	DESCRIPTION	REMARKS
Selected Port	Will display selected port	
Port Priority	Set port priority.	A setting on network switches that determines which ports are preferred for forwarding traffic in spanning tree protocols like STP and RSTP.
Port Cost	Set port cost.	Port cost is a value assigned to each port on a switch to indicate the cost of sending data through that port.
Port Fast	Enable / disable port fast.	Port fast is a feature in Spanning Tree Protocol (STP) designed to **speed up port transition** on a switch.
Port Root Guard	Enable / disable port root guard.	Port Root Guard is a security feature in Spanning Tree Protocol (STP) that helps prevent unauthorized switches from becoming the root bridge.

PoE

PoE delivers power over standard Ethernet cables (Cat5, Cat5e, Cat6, etc.) to network devices such as IP cameras, wireless access points, VoIP phones and other PoE-enabled devices. This is achieved by injecting power into the Ethernet cable at the switch or through a PoE injector, allowing a single cable to provide both data connection and electrical power to devices.

Click on "PoE". You will be redirected to the PoE settings page, where you can configure your PoE settings.

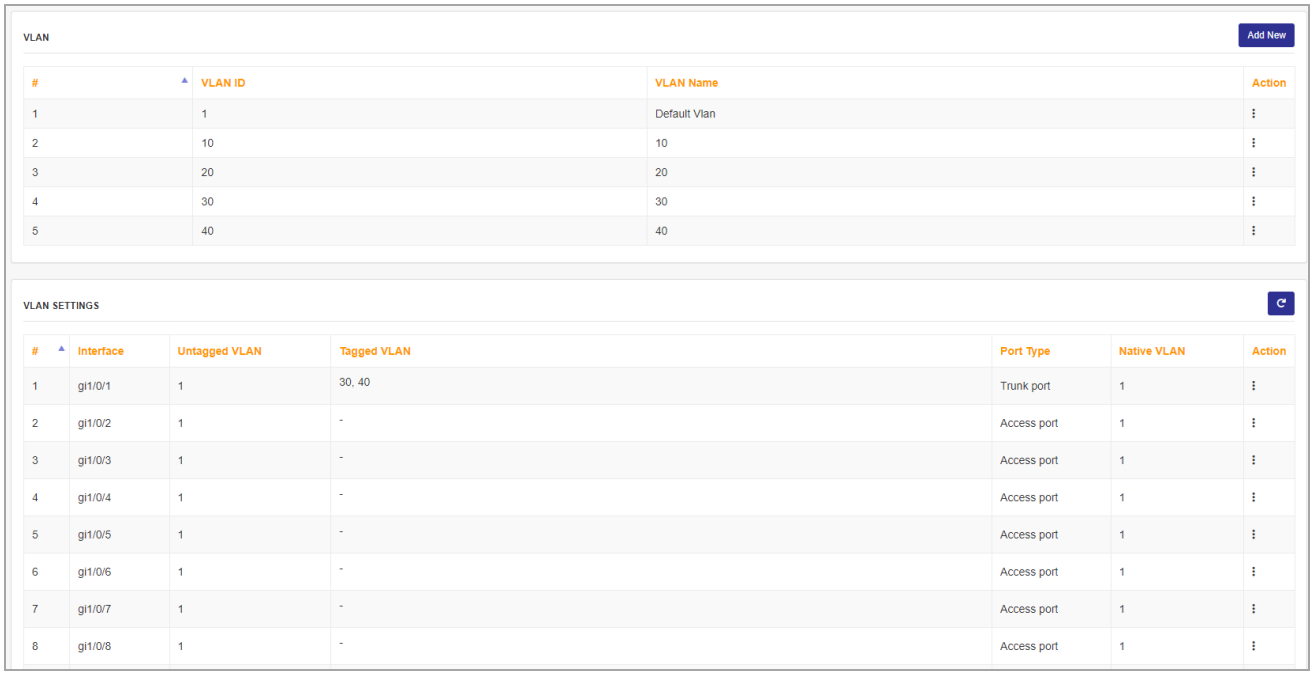


PARAMETERS	DESCRIPTION
Port Number	Will display port number count
	Port selection box
Interface	Will display Interface (port) detail
Port PoE Status	PoE power enable / disable.
Priority	Will display priority Low / High / critical
Power Limit (Milliwatts)	Will display power limit.
Power Status	Will display power status.
Output Power Class	Will display output power classes.
Output Power (Milliwatts)	Will display output power in milliwatts.
Action	Option with that user can edit PoE configuration

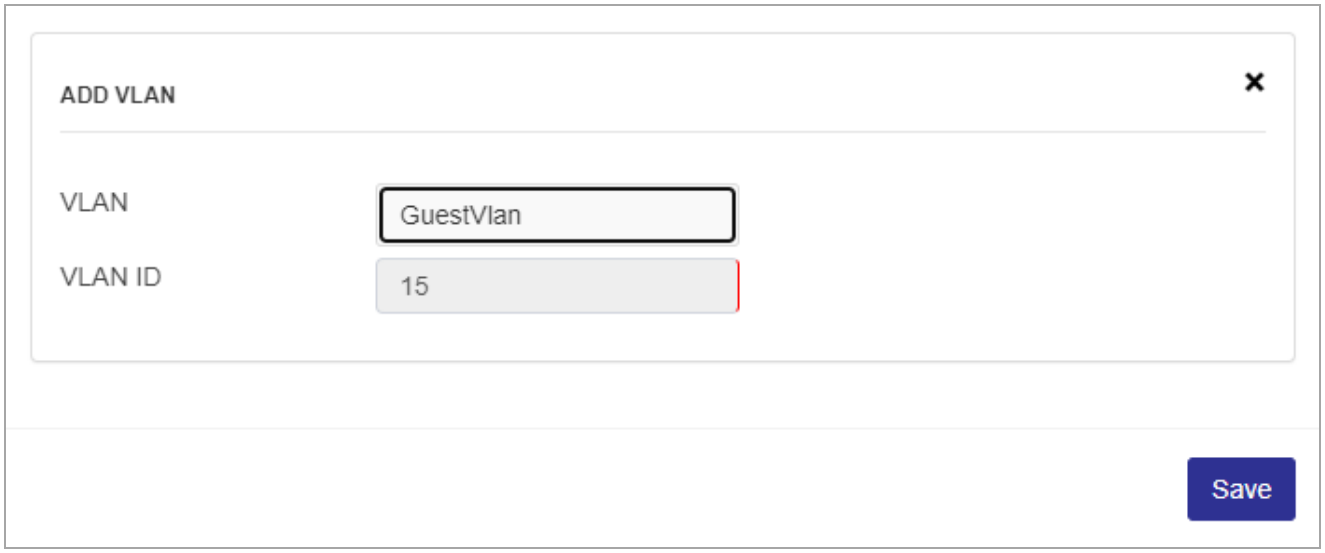
VLAN

In a switching network, VLANs (Virtual Local Area Networks) are used to segment the network into different broadcast domains.

Click on "VLAN" to be redirected to the page where you can create multiple VLANs and configure their settings as needed.



For , Create new VLAN click on “Add New”.



VLAN

PARAMETERS	DESCRIPTION
VLAN ID	Assign VLAN ID
VLAN Name	Assign name of VLAN

VLAN Setting

PARAMETERS	DESCRIPTION
Port Number	Will display port number count
Interface	Will display Interface (port) detail
Untagged VLAN	An untagged VLAN is a VLAN that does not include a tag in the Ethernet frame header. The frame is treated as belonging to the default VLAN assigned to the port (often referred to as the "native VLAN"). Used on **Access Ports**, do not include VLAN tags, typically carry traffic for a single VLAN.
Tagged VLAN	A tagged VLAN is a VLAN that includes a tag (usually an IEEE 802.1Q tag) in the Ethernet frame header. This tag identifies the VLAN to which the frame belongs. Used on **Trunk Ports**, include VLAN tags in the frame, carry traffic for multiple VLANs.
Port Type	Select port type Access or Trunk as per the requirement
Native VLAN	Shows Native Vlan.
Action	Option with that user can edit VLAN configuration

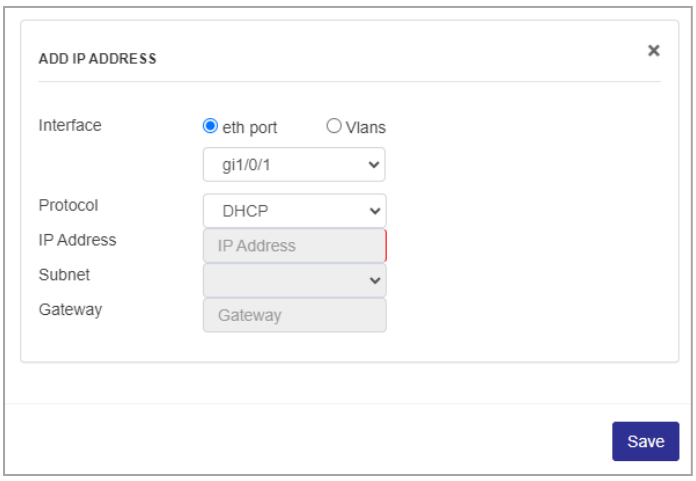
Layer-3

IP Configuration

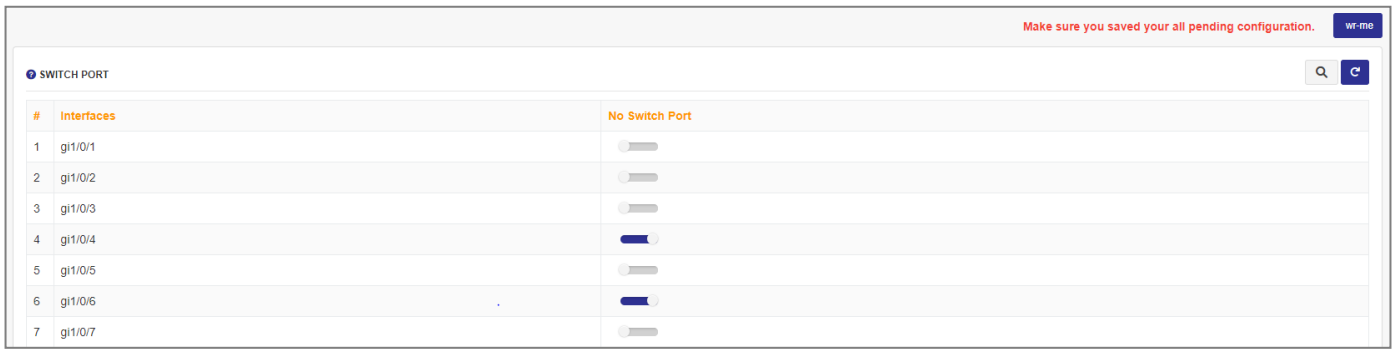
Layer-3 IP configuration in a network switch involves setting up the switch to perform routing functions, allowing it to manage traffic between different VLANs or subnets.

Click on "IP Configuration" to be redirected to the page where you can add IP Configuration to set up the switch to perform routing functions.

Click on "Add" to set IP Interface and protocols.



Switch Port / Route Only

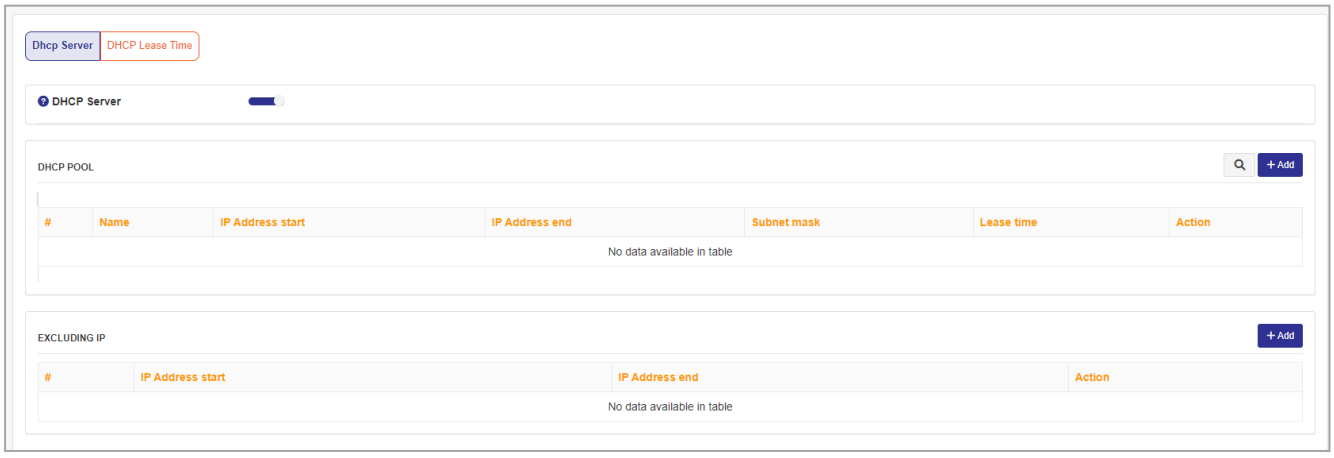


Enabling this option transforms the Layer-2 port into a Layer-3 port, causing it to function as a router interface instead of a switch port.

DHCP

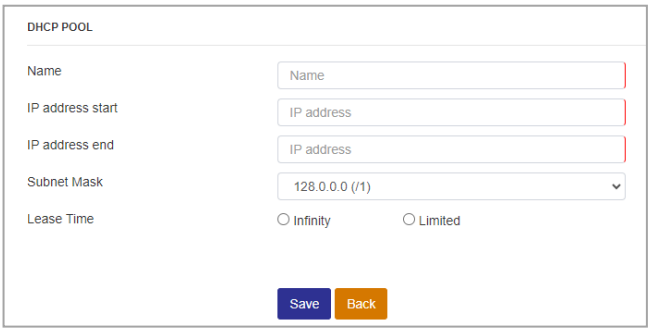
The DHCP (Dynamic Host Configuration Protocol) server function in network switching is crucial for automatically assigning IP addresses and other network configuration parameters to devices on a network. The DHCP server dynamically assigns IP addresses to devices (clients) on the network, ensuring each device gets a unique address without manual configuration.

By default, this option is disabled. Enable the DHCP option to dynamically assign IP addresses to devices connected to switches in the network when needed.



DHCP Pool

Click on "Add" to add DHCP pool.

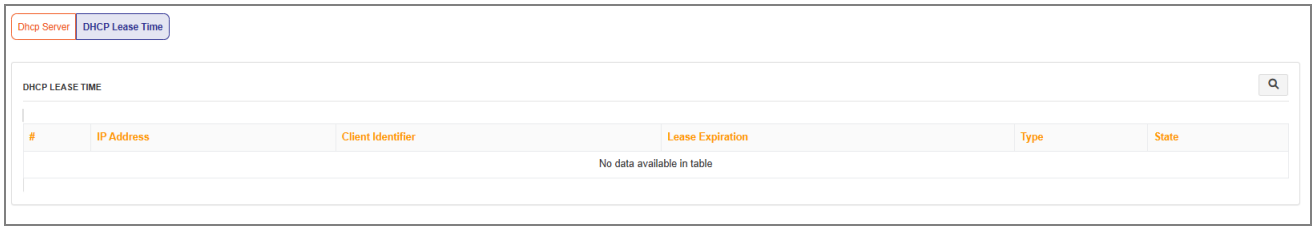


PARAMETERS	DESCRIPTION
Name	Assign Name
IP address start	Enter the starting IP address of the range to be assigned in DHCP pool
IP address end	Enter the last IP address of the range to be assigned in DHCP pool
Subnet Mask	Enter the subnet mask
Lease Time	Select Lease time

Click on "Add" to add an Excluding IP address range in case of requirement.

PARAMETERS	DESCRIPTION
Excluding IP Start	Enter the starting IP address of the range to be excluded from the assigned DHCP pool.
Excluding IP End	Enter the last IP address of the range to be excluded from the assigned DHCP pool.

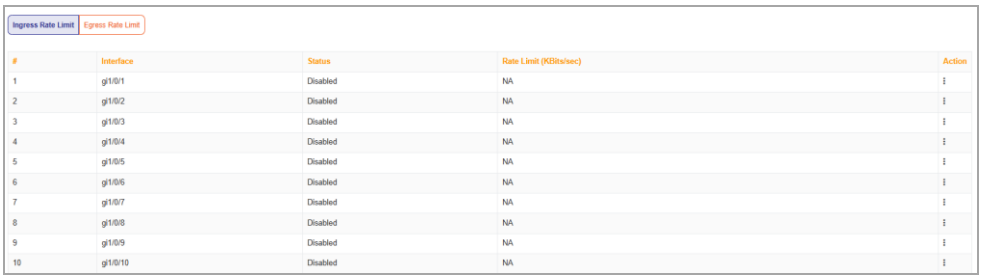
DHCP Lease Time



Bandwidth Control

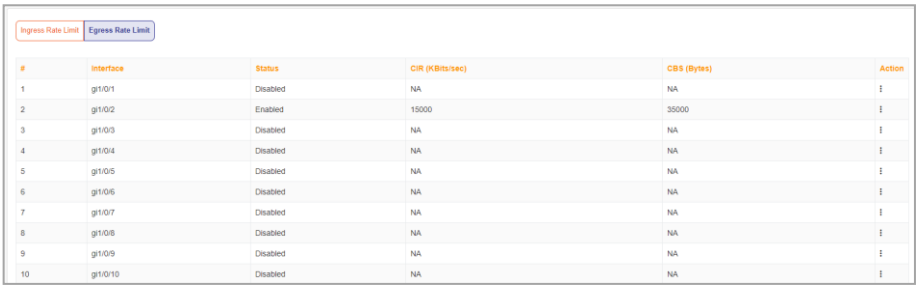
Ingress Rate Limit

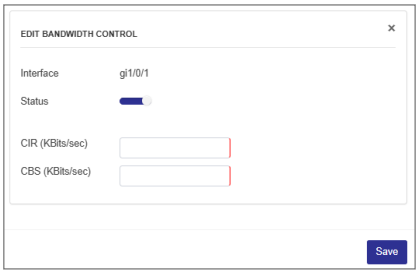
Ingress rate limiting in switches is a feature that controls the amount of incoming traffic to a network port. It helps prevent network congestion and ensures fair bandwidth distribution by limiting the rate at which packets are received.



PARAMETERS	DESCRIPTION
Interface	Interface number
Status	Enable/Disable parameter
Rate Limit (KBits/sec)	Set rate limit.
Action	Option with that user can enable respective interface status and can set rate limit

Egress Rate Limit

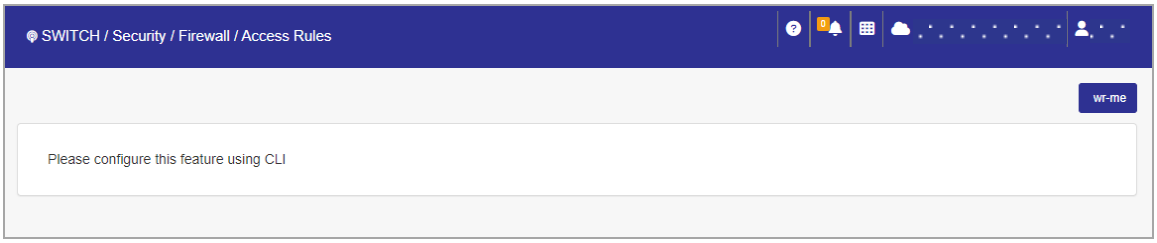




PARAMETERS	DESCRIPTION
Interface	Interface number
Status	Enable/Disable parameter
CIR (KBits/sec)	Set CIR.
CBS (Bytes)	Set CBS.
Action	Option with that user can enable respective interface status and can CIR / CBS

Security

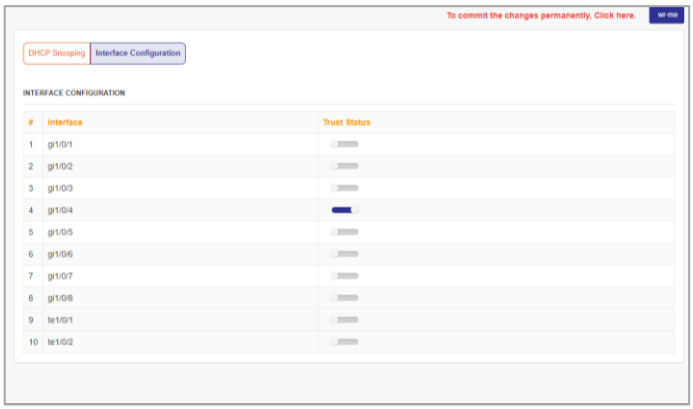
Firewall

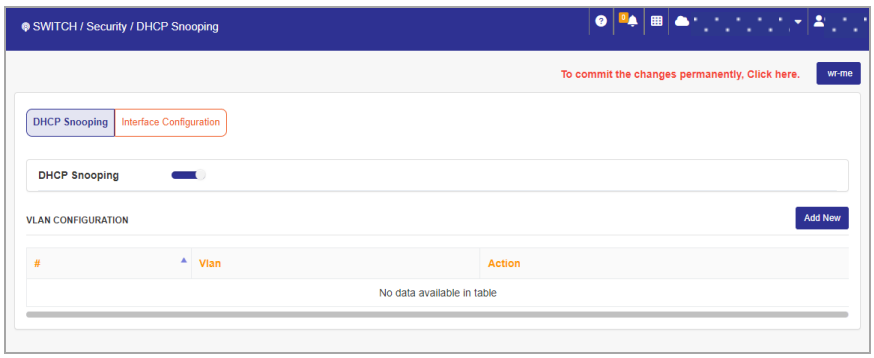


Access rules in the Firewall can be configured using the CLI.

DHCP Snooping

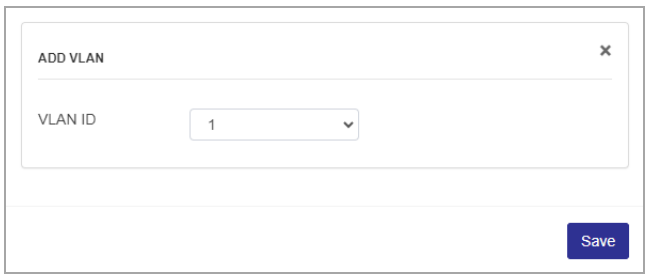
DHCP Snooping is a security feature on network switches that helps protect against rogue DHCP servers and other DHCP-related attacks. It monitors and controls DHCP traffic on a Layer 2 network, ensuring that only authorized DHCP servers can assign IP addresses to clients.





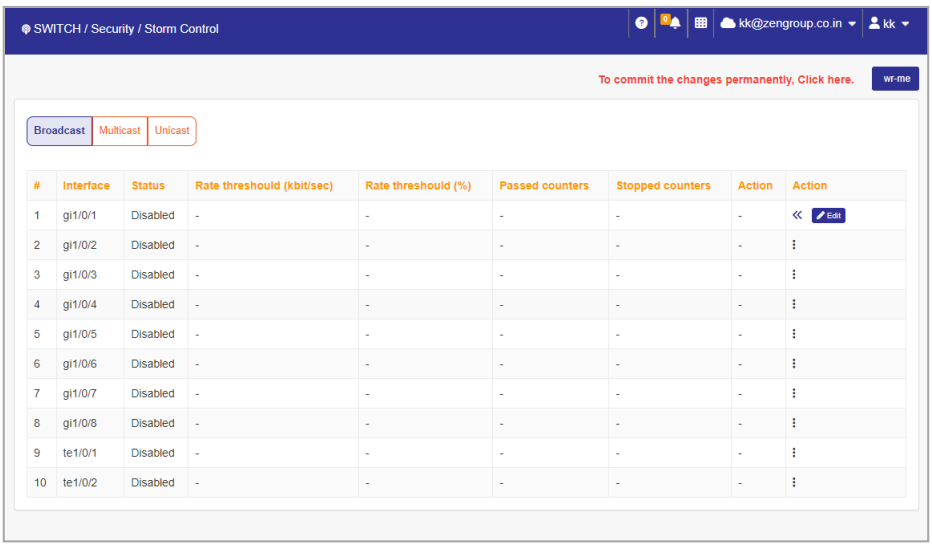
To apply DHCP snooping on a particular VLAN.

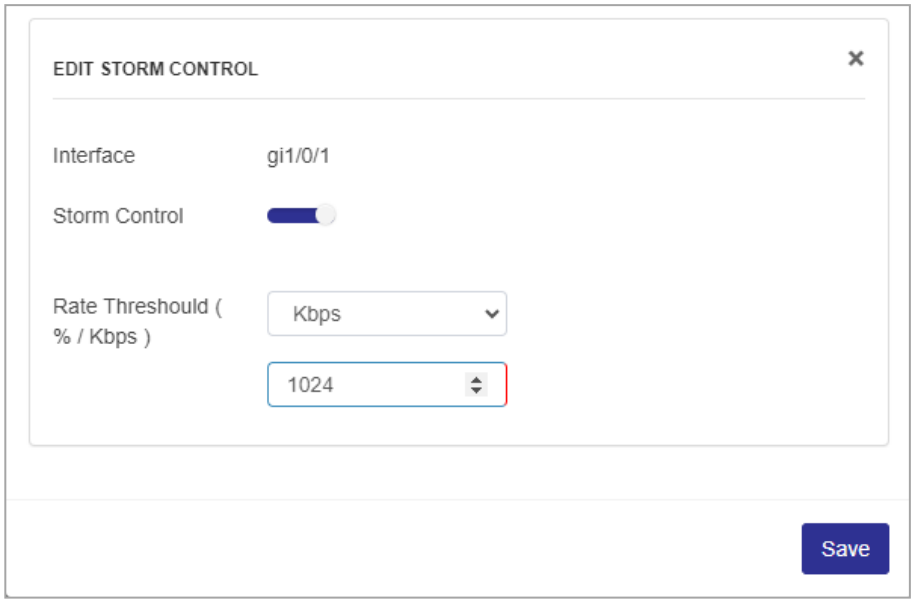
Add VLAN.



Strom Control

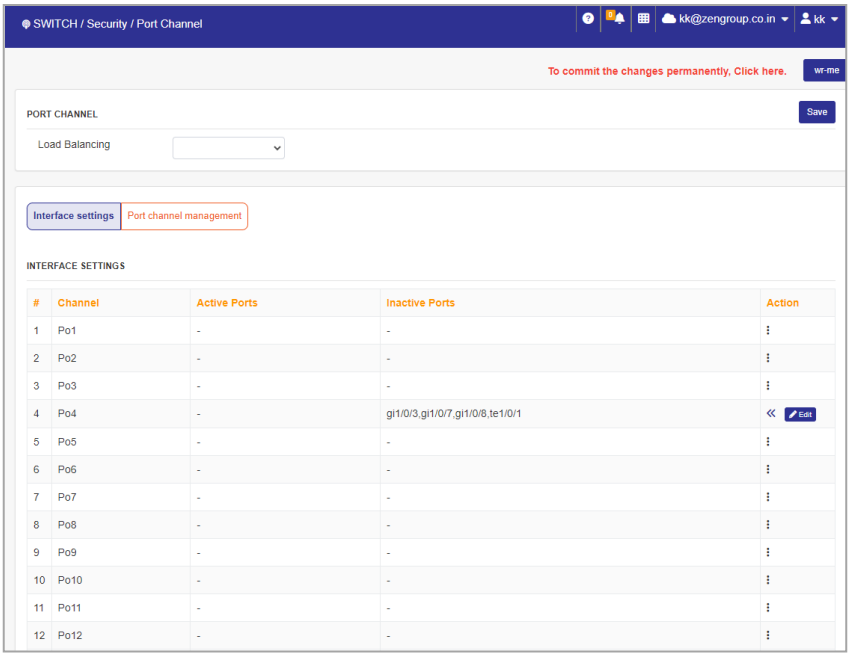
Storm control in a network switch is a feature designed to prevent network disruptions caused by traffic floods, such as broadcast, multicast, or unicast storms. These storms occur when there is an excessive amount of broadcast, multicast, or unicast traffic, often caused by misconfigurations, loops, or malicious activity, and can overwhelm the switch, degrade network performance, or cause a complete network outage.

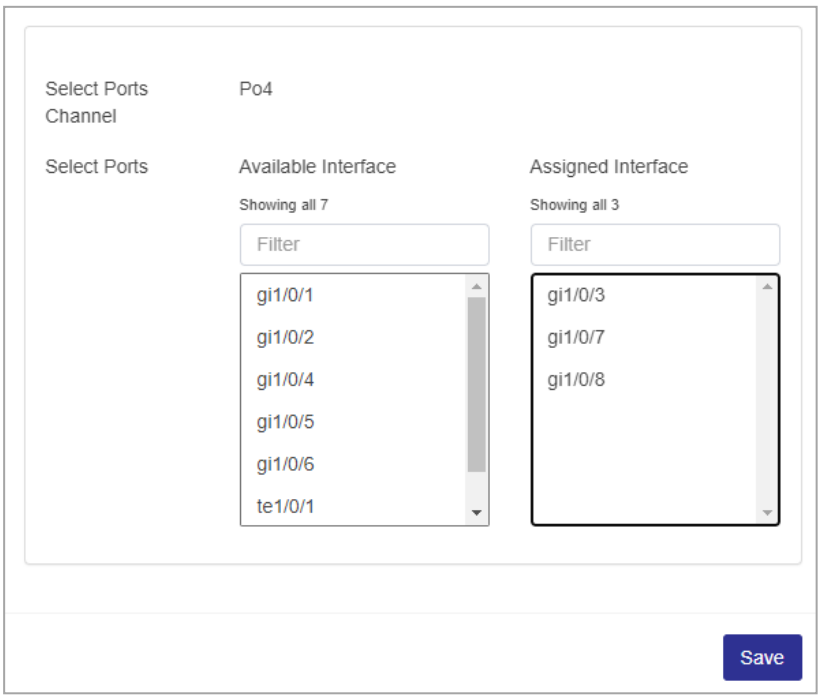




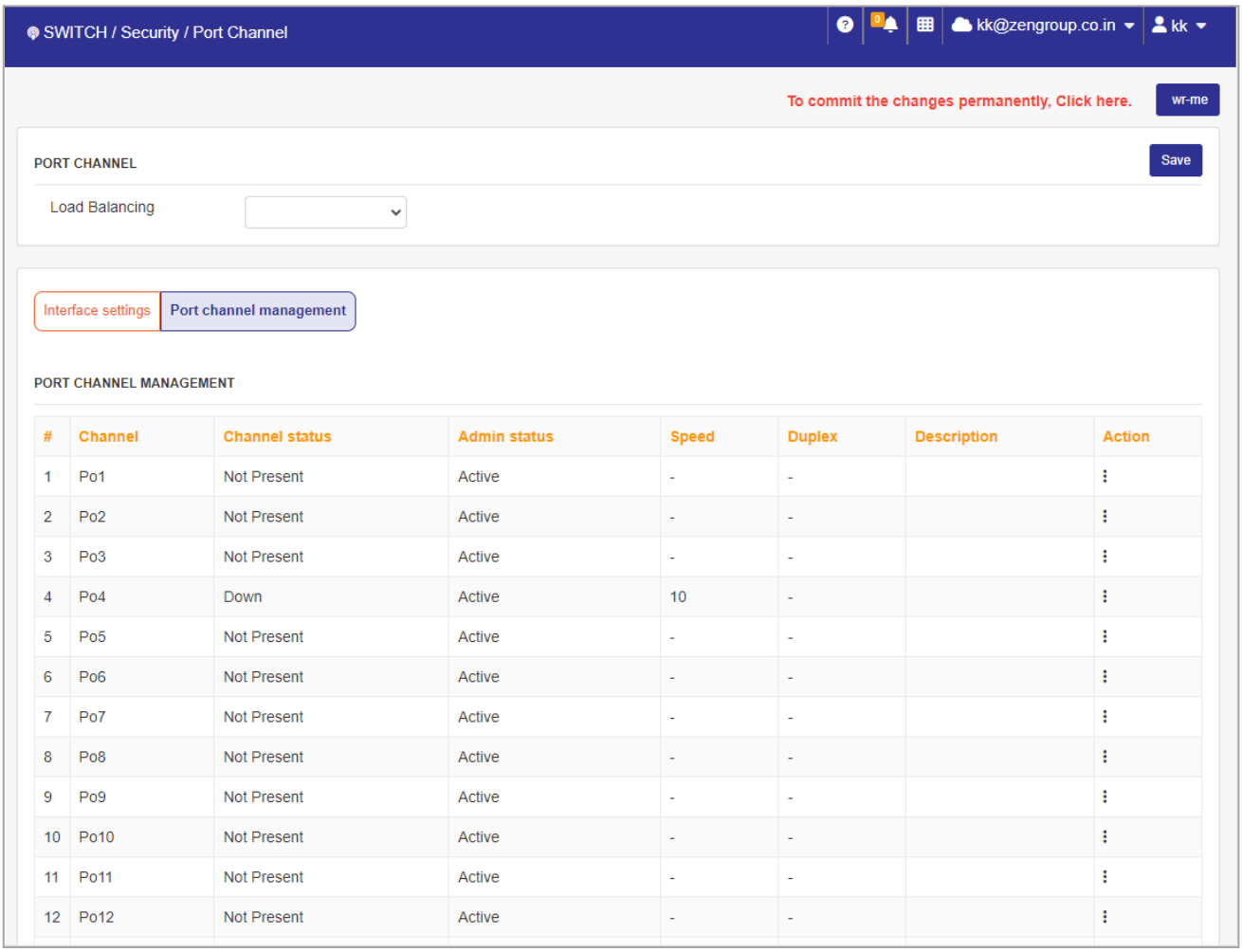
Port Channel

A Port Channel (also known as an EtherChannel or Link Aggregation Group (LAG)) on a network switch is a logical interface that combines multiple physical interfaces (ports) into a single link, providing increased bandwidth, redundancy, and load balancing across the physical connections.





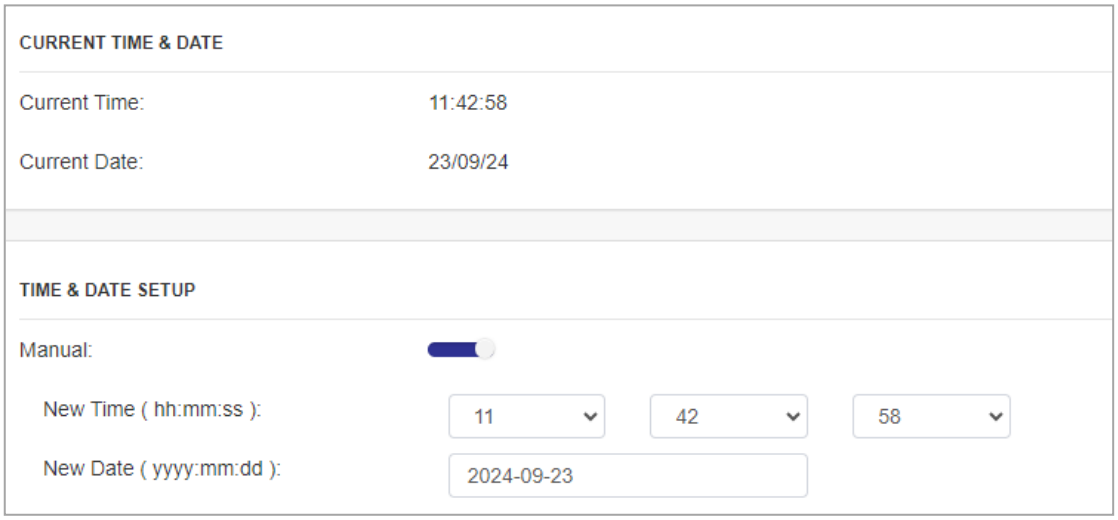
The purpose of port channel management is to control port channels that have been created.


SWITCH / Security / Port Channel
kk@zengroup.co.in
kk
To commit the changes permanently, Click here.
wr-me
PORT CHANNEL
Save
Load Balancing
Interface settings
Port channel management
PORT CHANNEL MANAGEMENT
Channel Channel status Admin status Speed Duplex Description Action
1 Po1 Not Present Active - -
2 Po2 Not Present Active - -
3 Po3 Not Present Active - -
4 Po4 Down Active 10 -
5 Po5 Not Present Active - -
6 Po6 Not Present Active - -
7 Po7 Not Present Active - -
8 Po8 Not Present Active - -
9 Po9 Not Present Active - -
10 Po10 Not Present Active - -
11 Po11 Not Present Active - -
12 Po12 Not Present Active - -


SWITCH / Security / Port Channel
kk@zengroup.co.in
kk
wr-me
PORT CHANNEL CONFIGURATION
Save
Back
Selected Port
Po3
Port Description
test
Negotiation

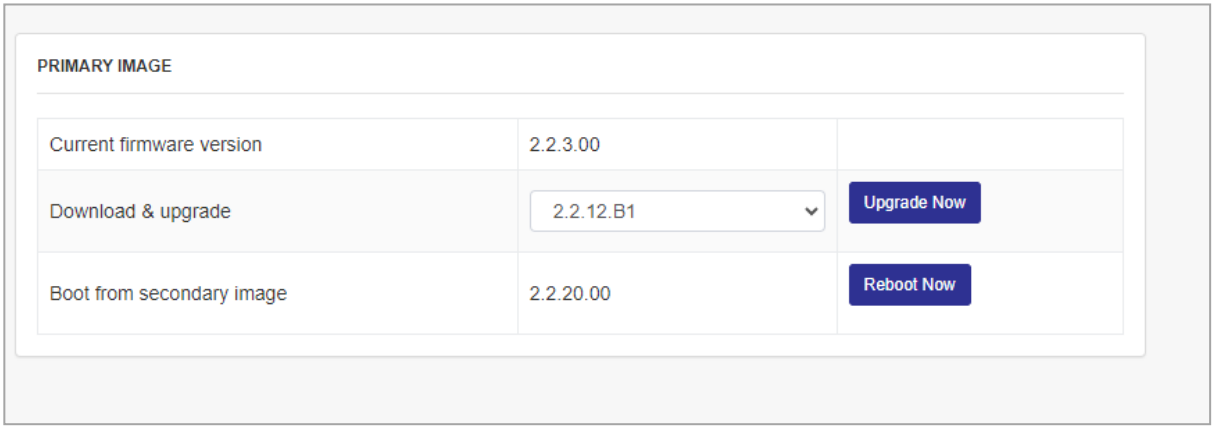
System Maintenance

Date and Time



PARAMETERS	DESCRIPTION
Current Date & Time	Will display the current Time and Date
Time & Date setup	Users can manually set the time and date, overriding the automatic settings with their manual configuration.

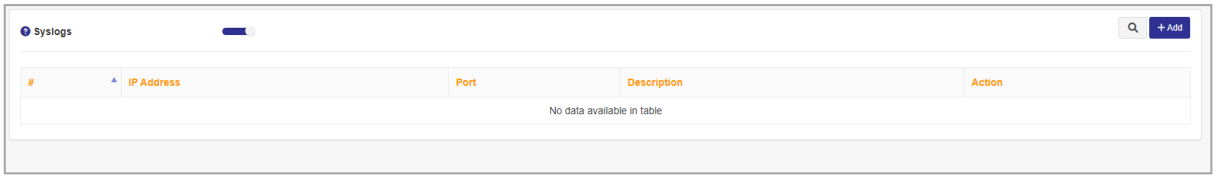
Maintenance



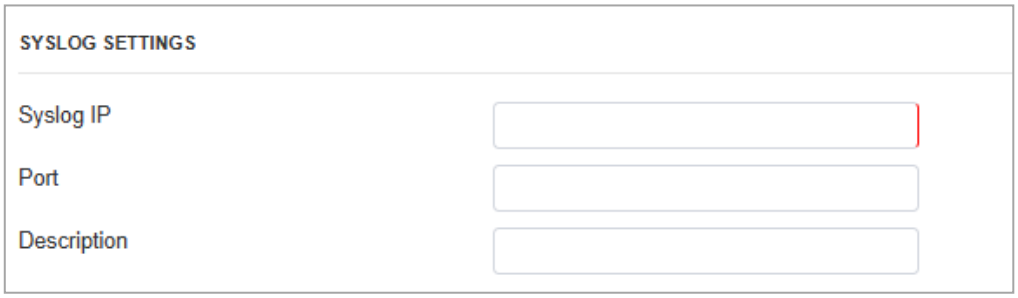
PRIMARY IMAGE	DESCRIPTION
Current firmware version	Will display the current firmware running on the switch
Download & upgrade	Select a file from the dropdown list of available firmware on Quantum Cloud, then click "Upgrade" to update the switch with the selected firmware
Boot from secondary image	Will display the previous firmware version before the switch was upgraded. Clicking on Reboot will revert the switch to this firmware

Services

Syslogs



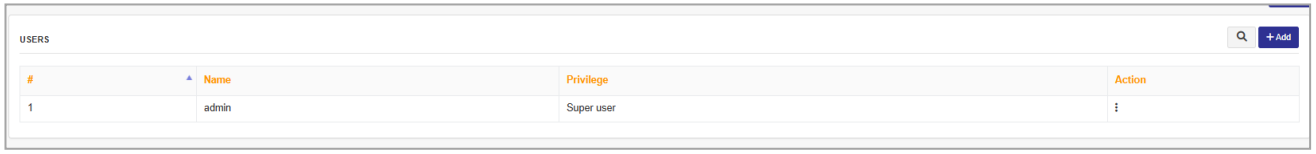
Click on "Add" to set Syslog IP.



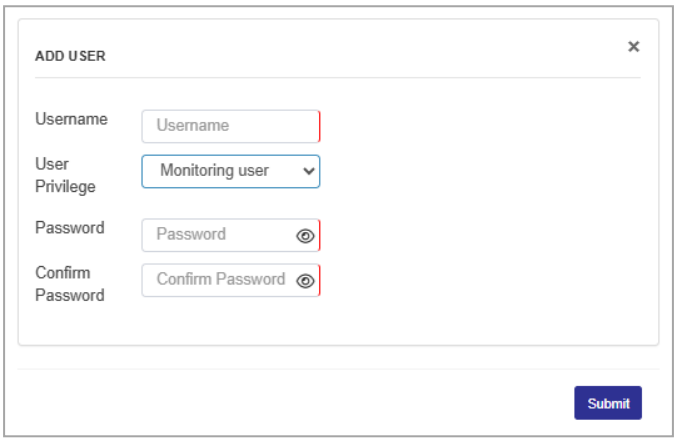
Syslog allows network administrators to collect and store logs from multiple devices in a centralized location. This makes it easier to monitor and analyze network activity and identify potential issues.

Management

Users



Click "Add" to create a user and assign different rights according to the required role.



Diagnostics

Ping

Ping (Packet Internet Groper) is a network administration tool used to test the reachability of a host on an Internet Protocol (IP) network.

Traceroute

Traceroute is a network diagnostic command used to display potential routes (paths) and measure the transit delays of packets across an Internet Protocol (IP) network.

Nslookup

NSlookup is a command-line tool used in network administration to query the Domain Name System (DNS). It retrieves information such as the mapping between domain names and IP addresses or other DNS records.

Startup Config

The "startup configuration" (or "startup config") is the configuration file stored in the non-volatile memory of the device. This file includes the initial settings and parameters the switch will use upon booting up.

Logs

Network switch logs are records of events and activities that occur on the device.