Content

Chapter 1 Introduction

1.1 Product Brief

1.1.1 Overview

SNR-S4550-24XQ-AC switch is the next generation of 10Gb Ethernet routing switches. SNR-S4550-24XQ-AC switch is based on 10Gb switching technology. It is particularly designed for 1000Mb server of data center to fetch in the scene in high consistency. It provides the cogent network sustentation for 1000Mb connecting to 10Gb scheme in data center and distripark network with the characteristic of high reliability, multiple redundancy, high consistency and flexible convergence proportion.

SNR-S4550-24XQ-AC:
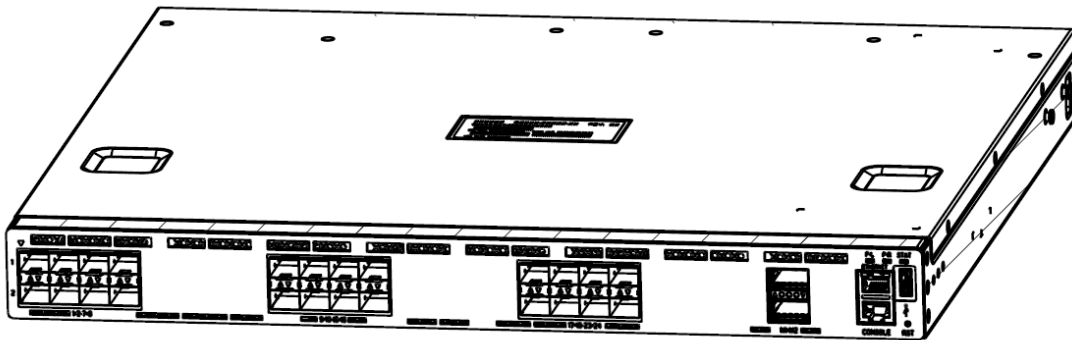
Figure 1-1 SNR-S4550-24XQ-AC Switch

SNR-S4550-24XQ-AC switch with advanced intelligent and secure features, can serve ideally as distribution layer switches for campus networks, enterprise networks and IP metropolitan networks; as well as core layer switches for small and medium-sized networks.

1.1.2 Features and Benefits

✧ **Various Interfaces**
SNR-S4550-24XQ-AC switch provides 24 10Gb SFP+ ports and 2 40Gb ports of QSFP+ ports. Each QSFP+ port can be split into 4 10Gb SFP+ ports.

✧ **Support 10Gb Ethernet**

10Gb Ethernet which adopts full-duplex technology instead of low-speed, half-duplex CSMA/CD protocol, is a big leap in the evolution of Ethernet. 10Gb Ethernet can be deployed in star or ring topologies. With 10Gb Ethernet, SNR-S4550-24XQ-AC switch provides broad bandwidth and powerful processing capacity. It is suitable for metropolitan networks and wide area networks. Using SNR-S4550-24XQ-AC switch, users can simplify network structures and reduce cost of network construction.

✧ **Networking Protocols**

SNR-S4550-24XQ-AC switch supports 802.1d/w/s, 802.1Q, 802.1p, 802.3ad, 802.3x, GVRP, DHCP and SNTP etc. The switches also support comprehensively the multicast protocols such as IGMP, DVMRP and PIM. Moreover, SNR-S4550-24XQ-AC switch supports RIPv1/2, OSPF and IPv6. All these protocols supported enable SNR-S4550-24XQ-AC switch to meet the requirements of complex network constructions.

✧ **ACL**

SNR-S4550-24XQ-AC switch supports comprehensively ACL policies. The traffic can be classified by source/destination IP addresses, source/destination MAC addresses, IP protocols, TCP/UDP, IP precedence, time ranges and ToS. And various policies can be conducted to forward the traffic. By implementing ACL policies, users can filter the virus packets such as "Worm.Blaster", "Worm.Sasser" and "Red Code" etc. SNR-S4550-24XQ-AC switch also supports IEEE802.1x port based access authentication, which can be deployed with RADIUS, to ensure the port level security and block illegal users.

✧ **QoS**

SNR-S4550-24XQ-AC switch fully support DiffServ Module. Users can specify a queue bandwidth on each port. WRR/SP/SWRR scheduling is also supported. SNR-S4550-24XQ-AC supports the port security. Users can deploy trusted CoS, DSCP, IP precedence and port priority. User can also modify packets' DSCP and COS values. The traffic can be classified by port, VLAN, DSCP, IP precedence and ACL table. User can also modify packets' DSCP and IP precedence values. Users can specify different bandwidths for voice/data/video to customize different qualities of service.

✧ **3D-SMP Ready**

SNR-S4550-24XQ-AC is up to the mustard of Self-defending security region management strategy according to Netware. It is supported interaction with some security system such as firewall, IDS, etc. It can defense the virus and aggress effectively from the extranet and internet. Thus enhance the security and stability of the network-wide.

✧ **Perfect Web Management.**

SNR-S4550-24XQ-AC supports SNMP, In-band and Out-of band Management, CLI and WEB interface and RMON. It can mail the correlative sensitive information to the administrator abide by SMTP protocol. SNR-S4550-24XQ-AC supports SSH protocol,

ensure the configuration management security of the switch. It is adopted the centralized web management system 'LinkManager' for unified management expedienty and compactly.

✧ **MPLS Ready**

SNR-S4550-24XQ-AC supports MPLS VPN which be used to metropolitan area network and wide area network and processes the hardware wire speed forward. It is a box switch that IPv6 and MPLS implement high-performance wire speed forward at the same time, and provides more help for building the grand IP network.

SNR-S4550-24XQ-AC supports LDP function and MPLS VPN (it can access the public network), and it can be deployed as PE and P.

1.2 Description of Hardware

1.2.1 Front Panel

1. Front Panel Diagram

The front panel descriptions of SNR-S4550-24XQ-AC switch in the following table.

Table 1-1 The front panel descriptions of SNR-S4550-24XQ-AC switch

Type	SFP+ port	QSFP+ port	10/100/1000Base-T ETHERNET port	Console port	USB2.0 interface
SNR-S4550-24XQ-AC	24	2	1	1	1

The front panel of SNR-S4550-24XQ-AC is shown below:

Figure 1-2 Front Panel of SNR-S4550-24XQ-AC

2. Console description

SNR-S4550-24XQ-AC switch provides a RJ-45 serial console port, the user perform the local and telnet configuration through this port.

The console port supports asynchronous mode, set the data bit as 8, the stop bit as 1, the parity bit as none, the default baud rate as 9600bps.

1.2.2 Back Panel

The back panel of SNR-S4550-24XQ-AC includes 2 alternating current of 220V (it provides redundancy backups) and 5 fan rabbets. It supports the power supply module of M6000-AC and it supports the fan module of M6000-FAN.
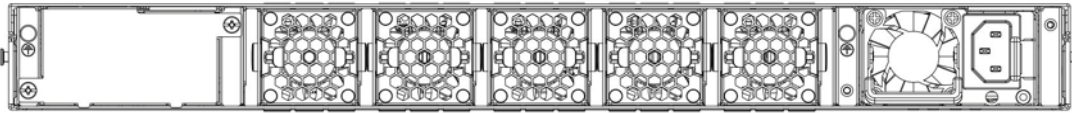

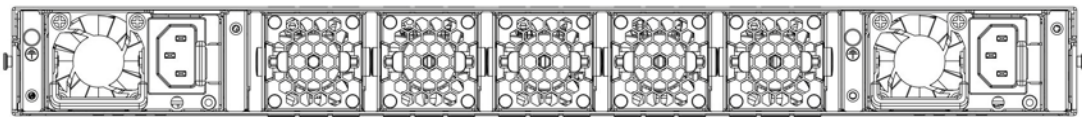Fig 1-3 Back panel of SNR-S4550-24XQ-AC (standard configuration)

Fig 1-4 Back panel of SNR-S4550-24XQ-AC (full in)

1.3 Status LEDs

The indicator light on front panel of SNR-S4550-24XQ-AC has 24 SFP+ port indicator light, 2 QSFP+ port indicator light, 2 power supply indicator light and system automatic diagnoses LED. They are shown below and described in the following table.

Table 1-2 The explanation of indicator light of SNR-S4550-24XQ-AC 10Gb routing switch

Indicator light	Panel sign	State	Meanings
Power supply indicator light	P-L / P-R	Green light always on	Power supply module move normally.
		Put out	No power supply or make a mistake.
System automatic diagnoses LED	STAT	Green light winks fast	A system automatic diagnosis is carrying through.
		Green light winks slowly	A system automatic diagnosis is completed.

Table 1-3 The explanation of the port indicator light

Indicator light	Panel sign	State
ETHERNET port Link light (right)	Green	The port is under the connection state of 10M, 100M or 1000M.

	Put out	No connection or fail to connect.
ETHERNET port Activity light (left)	Wink	The port is transmitting data.
	Put out	There is no data transmitting on port.
Indicator light of SFP+ port	Green	The port is under the connection state of 10G.
	Amber	The port is under the connection state of 1G.
	Wink	The port is transmitting data.
	Put out	No connection or fail to connect.
Indicator light of QSFP+ port	Green	The port is under the connection state of 40G.
	Amber	The port is under the connection state of lower than 40G.
	Wink	The port is transmitting data.
	Put out	No connection or fail to connect.

1.4 Port Description

SNR-S4550-24XQ-AC provides 24 10G SFP+ ports and 2 40Gb QSFP+ ports.

SNR-S4550-24XQ-AC switch supports the following SFP transceivers:

- SFP-SX-L   transceiver
- SFP-LX-L   transceiver
- SFP-LX-20-L   20 km transceiver
- SFP-LX-40   40 km mid distance transceiver
- SFP-LH-70-L   70 km long distance transceiver
- SFP-LH-120-L   120 km long distance transceiver
- SFP-GT   1000 Base-T SFP interface cards module

Each port description in the following:

Table 1-4 SNR-S4550-24XQ-AC port description

Port mode	Spec
RJ-45 port	• 10/100/1000Mbps auto negotiation • MDI/MDI-X cable mode auto negotiation • 5 kinds of UTP: 100 m
SFP	• SFP-SX-L transceiver 1000Base-SX SFP(850nm,MMF,550m) • SFP-LX-L transceiver 1000Base-LX SFP(1310nm, SMF, 10km or MMF, 550m) • SFP-LX-20-L transceiver 1310nm light wave, 9/125um single mode fiber: 20km

	• SFP-LX-40 transceiver 9/125um single mode fiber: 40km • SFP-LH-70-L transceiver 9/125um single mode fiber: 70km • SFP-LH-120-L transceiver 9/125um single mode fiber: 120km
QSFP+	● 40GBASE-CR4 transceiver Copper, 7m ● 40GBASE-SR4 transceiver 850nm, MMF, OM3/OM4, 100m

SNR-S4550-24XQ-AC provides 2 QSFP+ ports and supports the QSFP+ cable. It enhances the flexibility of the network. User can select the cables according to the demand.

1.5 M6000-AC Power Supply Module

M6000-AC is the power supply module of SNR-S4550-24XQ-AC. The whole appearance sketch map is below:

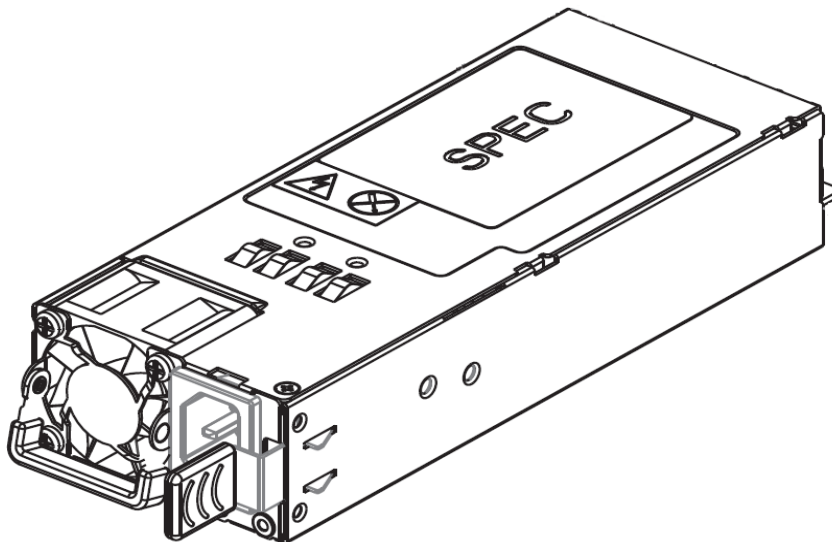Fig 1-5 The sketch map of M6000-AC

SNR-S4550-24XQ-AC switch must have one M6000-AC. When two power supply are at their position, it provides redundancy backups.

The maximum power is 460W, the import is 100VAC~240VAC and the export is 12V +/- 5%. There is a fan and a handle for sticking in or pulling out the module on the back of the power supply. The power supply module supports the hot plug.

1.6 M6000-FAN Fan Module

M6000-FAN is the fan module of SNR-S4550-24XQ-AC. The whole appearance sketch map is below:
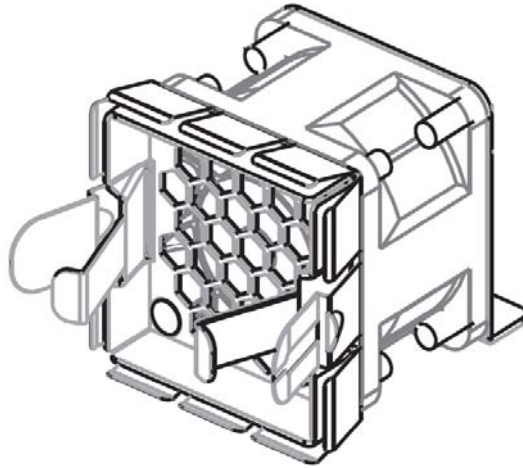
Fig 1-6 The sketch map of M6000-FAN

SNR-S4550-24XQ-AC switch has 5 M6000-FAN in standard configuration. The rotate speed of fan adjusts itself adapt to the system temperature.

1.7 System Specifications

Table 1-5 System Specifications of SNR-S4550-24XQ-AC

Type Attribute	SNR-S4550-24XQ-AC
Dimension(W * H * D) (mm)	438×433.3×43.80
Weight	7.81 kg
Fixed Port	24 SFP+ ports; 2 QSFP+ ports
Management Port	1 RJ-45 serial console port
Power Input	100~240VAC(50~60Hz) 2.8A~5.6A
System Consumption	<336W
Operating Temperature	0°C~45°C
Storage Temperature	-40°C~75°C
Relative Humidity	10%~90%, no condensate

Chapter 2 Installation Notice

To ensure the proper operation of SNR-S4550-24XQ-AC and your physical security, please read carefully the following installation guide.

2.1 Environmental Requirements

- The switch must be installed in a clean area. Otherwise, the switch may be damaged by electrostatic adherence.
- Maintain the temperature within 0 to 40 °C and the humidity within 10% to 90%, non-condensing.
- The switch must be put in a dry and cool place. Leave sufficient spacing around the switch for good air circulation.
- The switch must work in the range of AC power input: 100 ~ 240VAC (50/60Hz).
- The switch must be well grounded in order to avoid ESD damage and physical injury of people.
- The switch should avoid the sunlight perpendicular incidence. Keep the switch away from heat sources and strong electromagnetic interference sources.
- The switch must be mounted to a standard 19'' rack or placed on a clean level desktop.

2.1.1 Dust and Particles

Dust is harmful to the safe operation of SNR-S4550-24XQ-AC. Dust can lead to electrostatic adherence, especially likely under low relative humidity, causing poor contact of metal connectors or contacts. Electrostatic adherence will result in not only reduced product lifespan, but also increased chance of communication failures. The recommended value for dust content and particle diameter in the site is shown below:

Max Diameter (µm)	0.5	1	3	5
Max Density (particles/m³)	1.4×10^5	7×10^5	2.4×10^5	1.3×10^5

Table 2-1 Environmental Requirements: Dust

In addition, salt, acid and sulfide in the air are also harmful to the switch. Such harmful gases will aggravate metal corrosion and the aging of some parts. The site should avoid harmful gases, such as SO_2, H_2S, NO_2, NH_3 and Cl_2, etc. The table below details the threshold value.

Gas	Average (mg/m³)	Max (mg/m³)
SO_2	0.2	1.5
H_2S	0.006	0.03
NO_2	0.04	0.15
NH_3	0.05	0.15
Cl_2	0.01	0.3

Table 2-2 Environmental Requirements: Particles

2.1.2 Temperature and Humidity

Although the switch is designed to use 5 fans, the site should still maintain a desirable temperature and humidity. High-humidity conditions can cause electrical resistance degradation or even electric leakage, degradation of mechanical properties and corrosion of internal components. Extreme low relative humidity may cause the insulation spacer to contract, making the fastening screw insecure. Furthermore, in dry environments, static electricity is liable to be produced and cause harm to internal circuits. Temperature extremes can cause reduced reliability and premature aging of insulation materials, thus reducing the switch's working lifespan. In the hot summer, it is recommended to use air-conditioners to cool down the site. And the cold winter, it is recommenced to use heaters.

The recommended temperature and humidity are shown below:

Temperature:		Relative humidity	
Long term condition	Short term condition	Long term condition	Short term condition
0 ~ 45°C	0 ~ 50°C	15 ~ 85%	10 ~ 90%

Table 2-3 Environmental Requirements: Temperature and Humidity

Caution!

A sample of ambient temperature and humidity should be taken at 1.5m above the floor and 0.4m in front of the switch rack, with no protective panel covering the front and rear of the rack. Short term working conditions refer to a maximum of 48 hours of continued operation and an annual cumulative total of less than 15 days. Formidable operation conditions refers to the ambient temperature and relative humidity value that may occur during an air-conditioning system failure, and normal operation conditions should be recovered within 5 hours.

2.1.3 Power Supply

Before powering on the power supply, please check the power input to ensure proper grounding of the power supply system. The input source for the switch should be reliable and secure; a voltage adaptor can be used if necessary. The building's circuit protection system should include in the circuit a fuse or circuit-breaker of no greater than 240 V, 5A. It is recommended to use a UPS for more reliable power supplying. .

Caution!

Improper power supply system grounding, extreme fluctuation of the input source, and transients (or spikes) can result in larger error rate, or even hardware damage!

2.1.4 Preventing Electrostatic Discharge Damage

Static electric discharges can cause damage to internal circuits, even the entire switch. Follow these guidelines for avoiding ESD damage:

- Ensure proper earth grounding of the device;
- Perform regular cleaning to reduce dust;
- Maintain proper temperature and humidity;
- Always wear an ESD wrist strap and antistatic uniform when in contact with circuit boards.

2.1.5 Anti-interference

All sources of interference, whether from the device/system itself or the outside environment, will affect operations in various ways, such as capacitive coupling, inductive coupling, electromagnetic radiation, common impedance (including the grounding system) and cables/lines (power cables, signal lines, and output lines). The following should be noted:

- Precautions should be taken to prevent power source interruptions;
- Provide the system with a dedicated grounding, rather than sharing the grounding with the electronic equipment or lightning protection devices;
- Keep away from high power radio transmitters, radar transmitters, and high frequency strong circuit devices;
- Provide electromagnetic shielding if necessary.

2.1.6 Rack Configuration

The dimensions of the SNR-S4550-24XQ-AC are designed to be mounted on a standard 19'' rack, please ensure good ventilation for the rack.

■ Every device in the rack will generate heat during operation, therefore vent and fans must be provided for an enclosed rack, and devices should not be stacked closely.

■ When mounting devices in an open rack, care should be taken to prevent the rack frame from obstructing the switch ventilation openings. Be sure to check the positioning of the switch after installation to avoid the aforementioned.

Caution!

If a standard 19'' rack is not available, the SNR-S4550-24XQ-AC can be placed on a clean level desktop, leave a clearance of 100mm around the switch for ventilation, and do not place anything on top of the switch.

2.2 Installation Notice

■ Read through the installation instruction carefully before operating on the system. Make sure the installation materials and tools are prepared. And make sure the installation site is well prepared.

■ During the installation, users must use the brackets and screws provided in the accessory kit. Users should use the proper tools to perform the installation. Users should always wear antistatic uniform and ESD wrist straps. Users should use standard cables and connecters.

■ After the installation, users should clean the site. Before powering on the switch, users should ensure the switch is well grounded. Users should maintain the switch regularly to extend the lifespan of the switch.

2.3 Security Warnings

■ When using SFP transceiver, do not stare directly at the fiber bore when the switch is in operation. Otherwise the laser may hurt your eyes.

■ Do not attempt to conduct the operations which can damage the switch or which can cause physical injury.

■ Do not install, move or disclose the switch and its modules when the switch is in operation.

■ Do not open the switch shell.

■ Do not drop metals into the switch. It can cause short-circuit.

■ Do not touch the power plug and power socket.

■ Do not place the tinder near the switch.

■ Do not configure the switch alone in a dangerous situation,

■ Use standard power sockets which have overload and leakage protection.

■ Inspect and maintain the site and the switch regularly.

◼ Have the emergence power switch on the site. In case of emergence, switch off the power immediately.

Caution!

Potential risk include: Electric leakage, Power supply arcing, Power line breakage, Imperfect earth, Overload circuit and Electrical short circuit. If electric shock, fire, electrical short circuit occurs, please cut off the electricity supply and alarm rapidly. Rescue the injured person in the contingency under inherently safe, give the injured person proper first aid treatment according to the injury state, and seek help from the Medical Emergency using various ways.

Chapter 3 Device Installation

3.1 Installation Preparation

3.1.1 Verify the Package Contents

Please unpack the shipping package and verify carefully the contents inside.

3.1.2 Required Tools and Utilities

The required tools and utilities are shown below:
- Cross screwdrivers
- Flat-blade screwdriver
- ESD wrist strap
- Antistatic uniform

Caution!

Users should prepare the required tools and utilities by themselves.
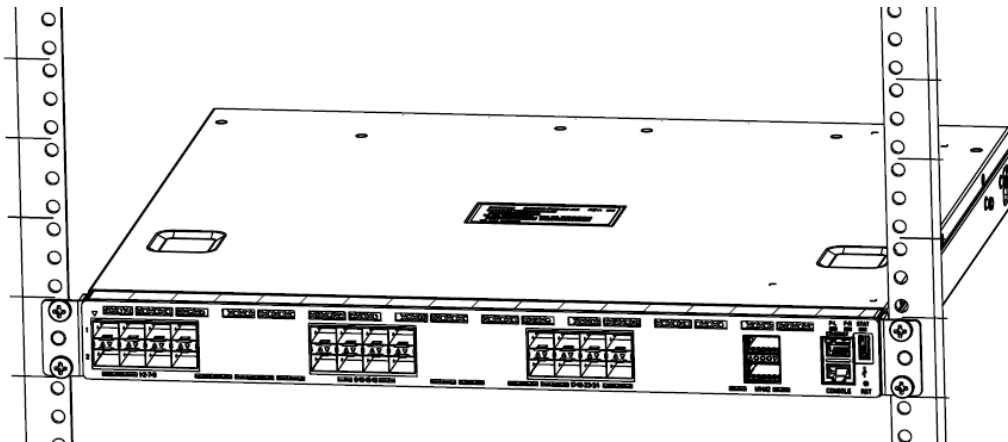
3.2 Device Installation

3.2.1 Installing the Switch

Figure 3-1 SNR-S4550-24XQ-AC switch install sketch map on the rack using stock

Please mount SNR-S4550-24XQ-AC on the 19'' rack as below:

1. Attach the 2 brackets on the SNR-S4550-24XQ-AC with screws provided in the accessory kit.

2. Put the machine on the stock of the rack when installing because the machine is quite heavy.

3. Put the bracket-mounted switch smoothly into a standard 19'' rack. Fasten the SNR-S4550-24XQ-AC to the rack with the screws provided. Leave enough space around the switch for good air circulation.

Caution!

The brackets are used to fix the switch on the rack. They can't serve as a bearing. Because the device is heavy, we suggest installing the rack tray on the bottom of the switch. Do not place anything on top of the switch. Do not block the blowholes on the switch to ensure the proper operation of the switch. If there is no tray, add the lugs (The device provides it) on the back of the switch to make it fix on the rack.

There is no back horn iron in standard configuration. If users bought it, the figure of installation is below:
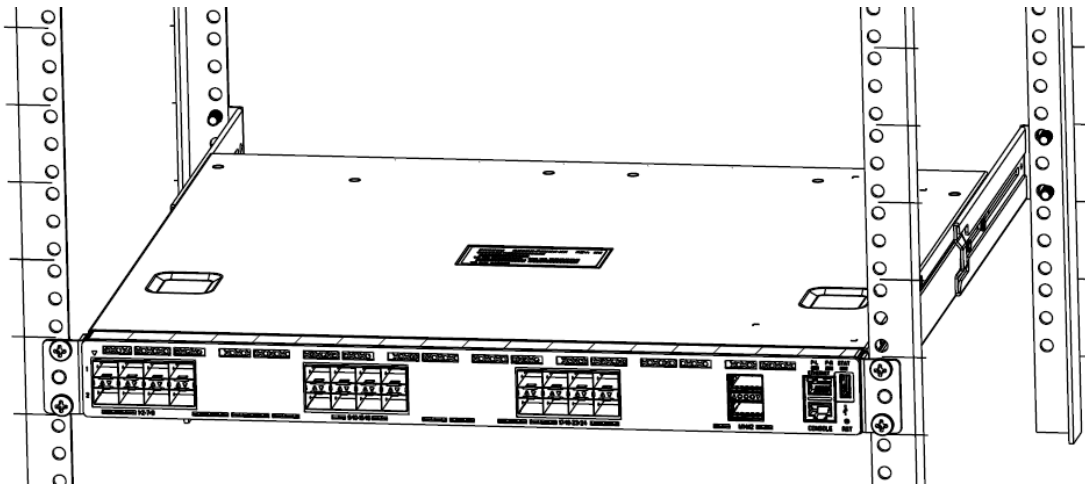

Figure 3-2 The figure of SNR-S4550-24XQ-AC switch installing on the rack by using the front and back horn iron

3.2.2 Installing the Power Supply Module

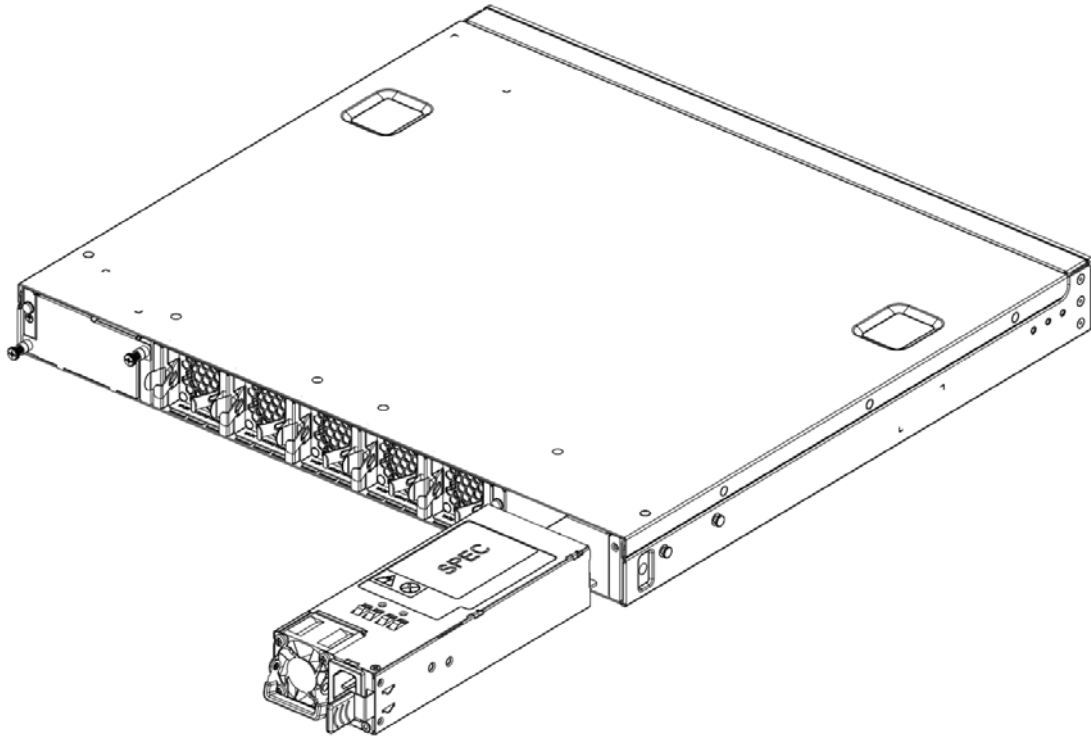SNR-S4550-24XQ-AC switch supports 2 power supplies.

Figure 3-3 The figure of SNR-S4550-24XQ-AC switch power supply installing

Please install the power supply module according to the following approach:

1.   Take out the power supply module from the little packing box.

2.   The golden finger is entad and aim at the power supply rabbet of the machine to
insert to the end downwards. You can hear the lock sound of "click".

3.   Force the board on the side of AC cable bore to the direction of fan when taking
out the power supply module. And draw the power supply forth.

3.2.3 Installing the Fan

SNR-S4550-24XQ-AC switch has 5 fans in standard configuration.
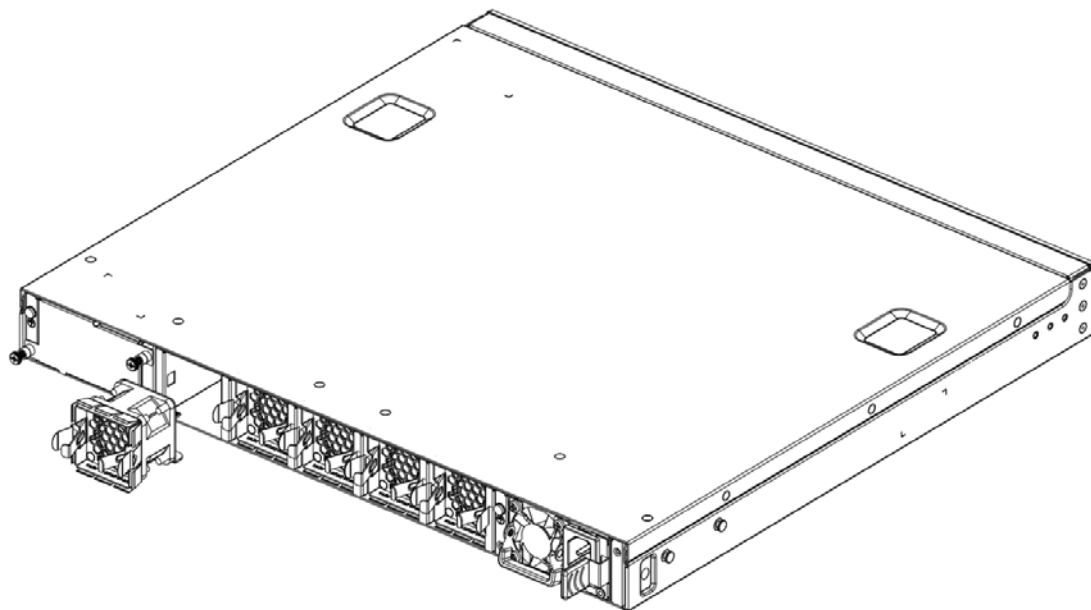
Figure 3-4 The figure of SNR-S4550-24XQ-AC switch installing the fan

Please install the fan module according to the following approach:

1.　The golden finger is inward and adown and aim at the fan rabbet of the back machine flatly to the end. You can hear the lock sound of "click".

2.　Pinch the sheet metal inward and draw the fan module forth when taking out it.

Caution!

　　The sheet metal edge of fan is thin, please watch your fingers when pinch, press, insert and pull it.

3.2.4 Connecting Console

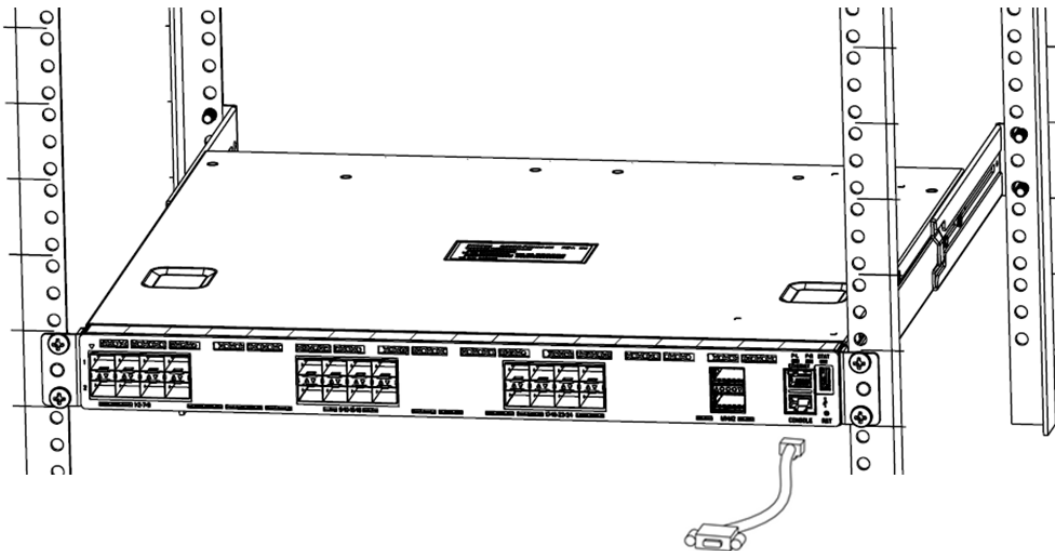SNR-S4550-24XQ-AC provide a serial console port.

Figure 3-5 Connecting Console to SNR-S4550-24XQ-AC 10Gb Routing switch

The connection procedure is listed below:

1. Find the console cable provided in the accessory kit. Attach the console cable end to console port of the switch.

2. Connect the other side of the console cable to a character terminal (PC).

3. Power on the switch and the character terminal. Configure the switch through the character terminal.

3.2.5 SFP/SFP+/QSFP+ Transceiver Installation

SNR-S4550-24XQ-AC provides 24 SFP/SFP+ transceiver slots and 2 QSFP+ ports.

The procedure for installing the SFP/SFP+/QSFP+ transceiver is shown below:

Step 1: Put on a ESD wrist strap (or antistatic gloves)

Step 2: Insert the SFP/SFP+/QSFP+ transceiver to the guide rail inside the SFP/SFP+/QSFP+ port. Do not put the SFP/SFP+/QSFP+ transceiver up-side-down.

Step 3: Push the SFP/SFP+/QSFP+ transceiver along the guide rail gently until you feel the transceiver snap into place at the bottom of the SFP/SFP+/QSFP+ port.

Note: the SFP/SFP+/QSFP+ transceiver is hot swappable.

Caution!

Do not stare directly at the 2 fiber bore in the SFP transceiver when the switch is in operation, otherwise the laser may hurt your eyes.

3.2.6 Copper Cable/Fiber Cable Connection

Copper cables should be connected as below:

Step 1: Insert one end of the Ethernet cable to the RJ-45 Ethernet port in the switch copper port;

Step 2: Insert the other end of the Ethernet cable to the RJ-45 Ethernet port of other device;

Step 3: Check all status indicators for the corresponding ports; a lighted LED indicates that the link has been established, otherwise the link is not ready and the cable should be examined.

Caution!

Please verify the sign above the port to ensure using the right port. Connecting to wrong ports might damage the switch.

Fiber cables should be connected as below:

Step 1: Remove the protective plug from the SFP/SFP+/QSFP+ fiber transceiver bore; Remove the protective cap from one end of the fiber cable. Keep the fiber end clean and neat.

Step 2: Attach one end of the fiber cable to the SFP/SFP+/QSFP+ transceiver, and attach the other end to the transceiver of the corresponding devices. Note: The SFP/SFP+/QSFP+ transceiver's TX port should be connected to the RX port of the corresponding device, and vice versa.

Step 3: Check the fiber port status indicator, a lighted LED indicates that the link has been established; otherwise the link is not ready and should be examined.

Caution!

Please verify the sign above the port to ensure using the other ports. Connecting to wrong ports might damage the transceiver or the other ports. When connecting other devices through a fiber cable to the switch, the output power of the fiber cable must not exceed the maximum received power of the corresponding modules. Otherwise, it will damage the fiber transceiver. Do not stare at the fiber bore when the switch is in operation. That may hurt your eyes.
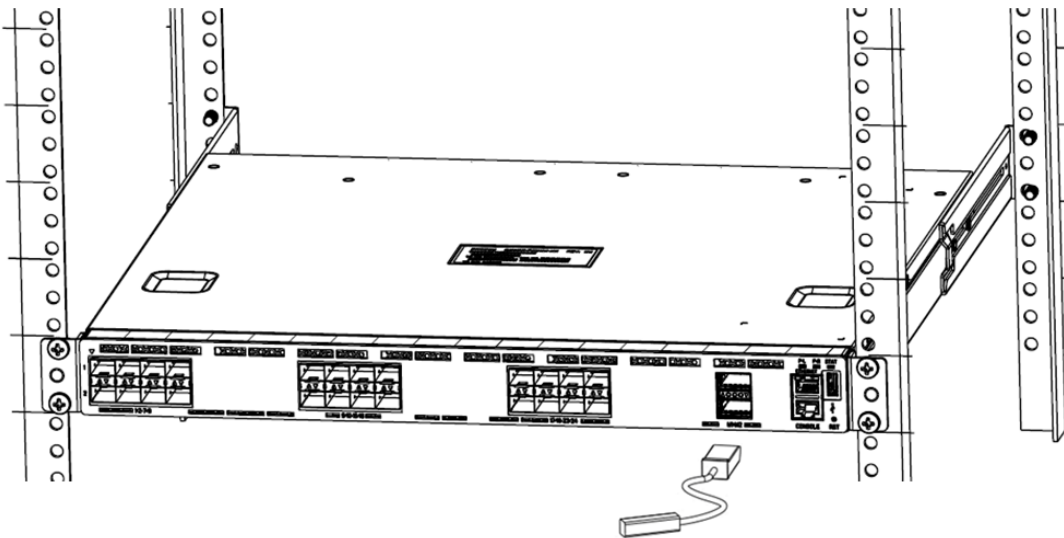
Figure 3-6 Connect the DAC cable to SNR-S4550-24XQ-AC switch

The connection approach of DAC cable is below:

1. Connect the two side of DAC cable to SFP/SFP+/QSFP+ transceiver of SNR-S4550-24XQ-AC switch.

2. Check out the indicator light state of the light port. If LINK light is bright, it means the link is connection. If LINK light puts out, it means the lines have trouble and please check out the line connection.

3.2.7 AC Power Supply Connection

SNR-S4550-24XQ-AC uses 220VAC power supply by default. Please read the power input specification for the detailed information.
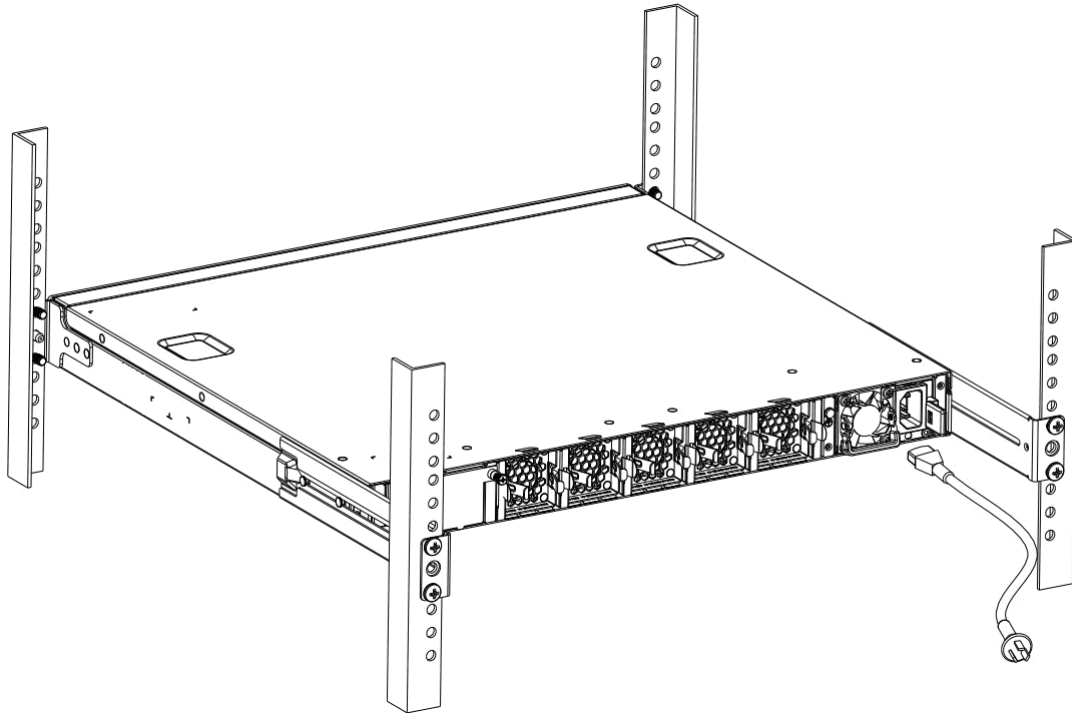
Figure 3-7 Connect the power supply cable to the SNR-S4550-24XQ-AC switch

AC Power supply connection procedure is described as below:

1. Insert one end of the power cable provided in the accessory kit into power source socket, and the other end to the power socket (with overload and leakage protection).

2. Check the power status indicator in the front panel of the switch. The corresponding PWR indicator should light. SNR-S4550-24XQ-AC is self-adjustable for the input voltage. As soon as the input voltage is in the range printed on the switch surface, the switch can operate correctly.

3. When the switch is powered on, it executes self-test procedure and startups.

Caution!

The input voltage must be within the required range, otherwise the switch can be damaged or malfunction. Do not open the switch shell without permission. It can cause physical injury.
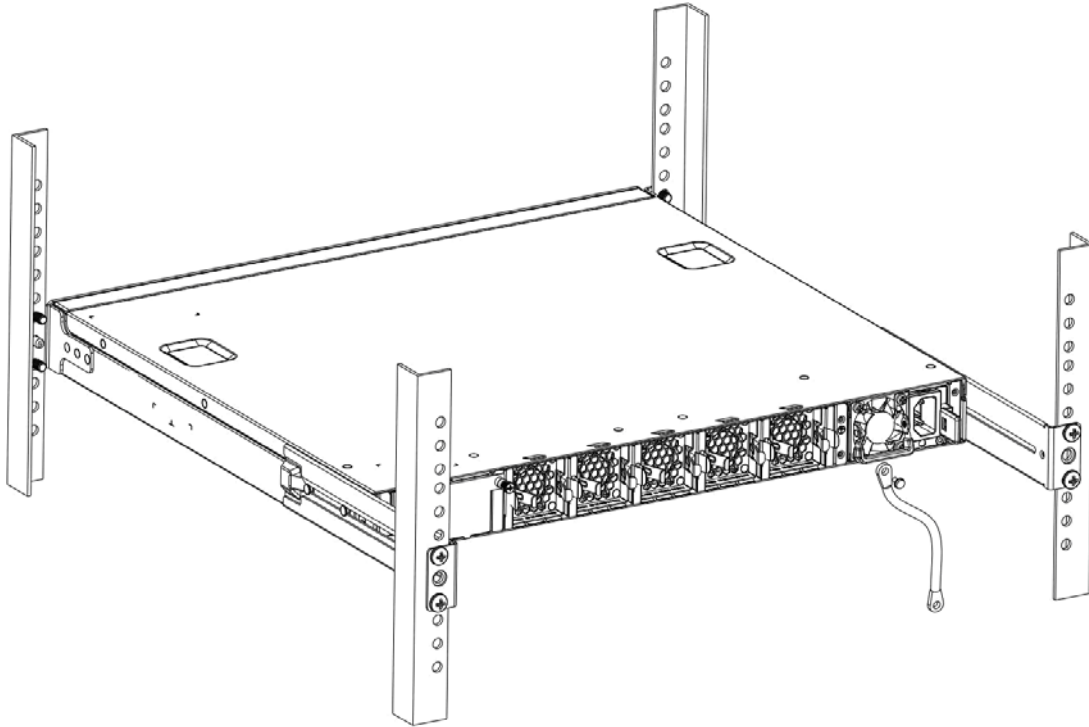
3.2.8 Earthing Cable Connection

Figure 3-8 Connect the earthing cable to the SNR-S4550-24XQ-AC switch

Please connect the earthing cable according to the following approach:

1. Screw out the fixed nut on the earthing pillar of the switch.

2. Cover one side of the earthing cable to the earthing pillar of the back panel.

3. Put and screw down the fixed nut.

4. Connect another side of the earthing cable to the earthing side.

3.2.9 Checking the Switch

- Whether the used power corresponds to the power of the sign.
- Whether the ground cable is connected.
- Whether the Console cable connect to power cable correctly.
- If there are cables at the outside, please ensure the cable is well connected with the lightning protection devices.