eSE620X vESC V100R001C00 Product Description

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Preface

- This course describes the positioning, highlights, networking architecture, hardware and software structures, and servers and cables of the eSE620X vESC.

Objectives

- **After learning this course, you will be able to:**

  - Describe the eSE620X vESC positioning and highlights.

  - Describe the eSE620X vESC networking architecture.

  - Be familiar with the eSE620X vESC software structure.

  - Be familiar with the eSE620X vESC hardware structure.

  - Be familiar with eSE620X vESC servers and cables.

Contents

- **eSE620X vESC Positioning**

- eSE620X vESC Networking Architecture

- eSE620X vESC Software Structure

- eSE620X vESC Hardware Structure

- eSE620X vESC Servers and Cables

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eSE620X vESC Positioning

- The eSE620X virtual enterprise service controller (ESC) is an important component of the communication system for Huawei OneAir. The eSE620X vESC applies to the LTE/System Architecture Evolution (SAE) architecture and provides high-speed mobile packet data services. It also provides voice, video, trunking communications, and industry-related services together with the eSE620X virtual enterprise service system (ESS).

eSE620X vESC Highlights

The eSE620X vESC is a competitive product developed by Huawei for the enterprise EPC. It has many outstanding features.

- **High integration**

- **Advanced ATCA platform**

- **High reliability**

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Capacity Specifications of the eSE620X vESC

Item	Specifications with the 1 U Subrack	Specifications with the 3 U Subrack
Number of subscribers supported by the vESC	10,000	200,000
Number of bearers supported by the vESC	30,000	600,000
Number of bearers activated by a UE at the same time	11	11
Number of eNodeBs supported by the vESC	100	1500
Throughput supported by the vESC	4 Gbit/s (512 bytes per packet)	20 Gbit/s (512 bytes per packet)

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# Reliability Specifications of the eSE620X vESC

| Item	Value
System availability in typical configuration	≥ 99.999%
Mean time between failures (MTBF)	≥ 24 years (full configurations) ≥ 42 years (a single subrack)
Mean time to repair (MTTR)	≤ 1 hour (excluding preparation time)
Redundancy backup mechanism	1+1 backup

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eSE620X vESC Deployed in an Enterprise Wireless Network Providing Mobile Packet Data Services
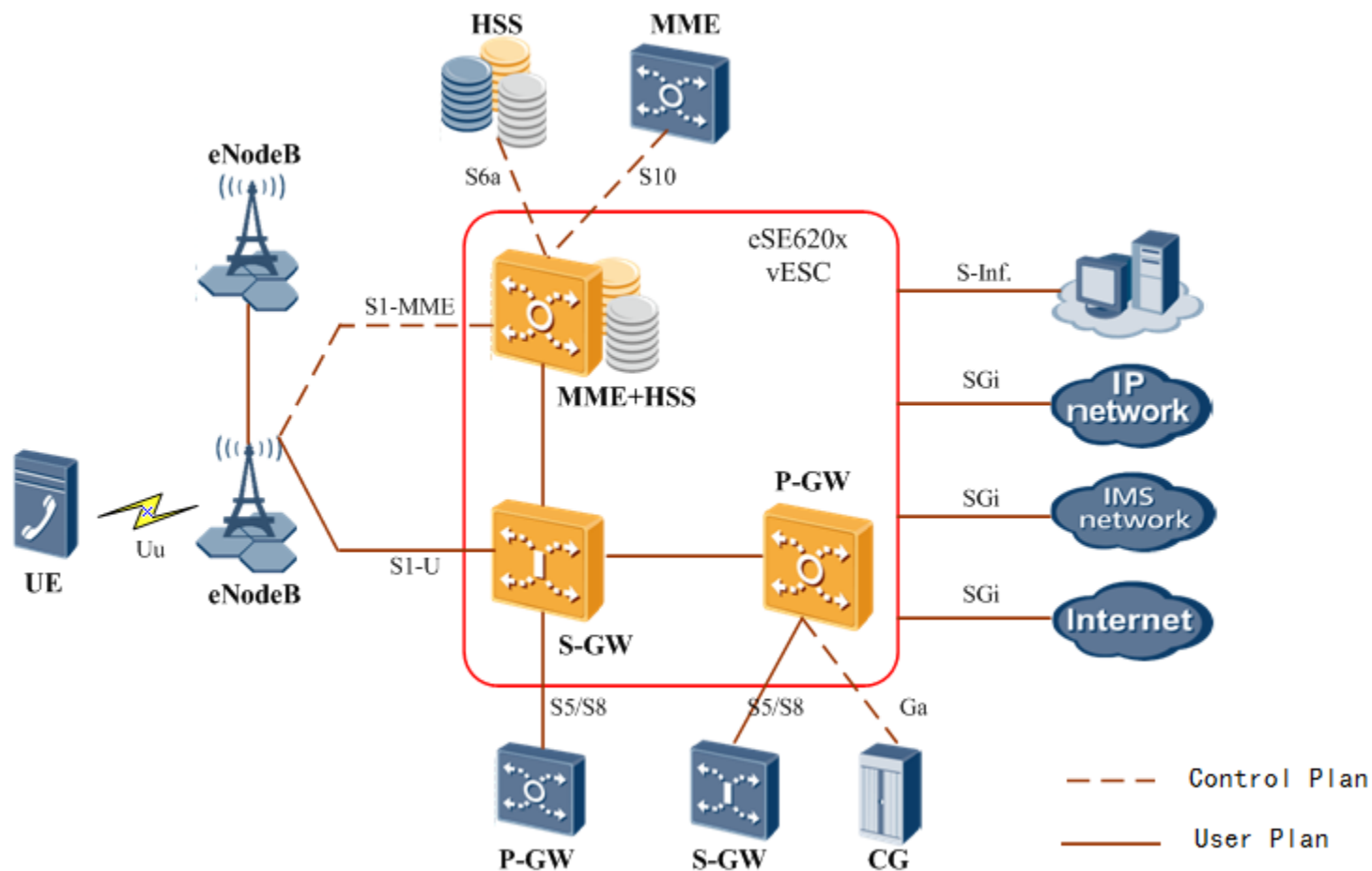
eSE620X vESC Deployed in an Enterprise Wireless Network Providing the eMBMS
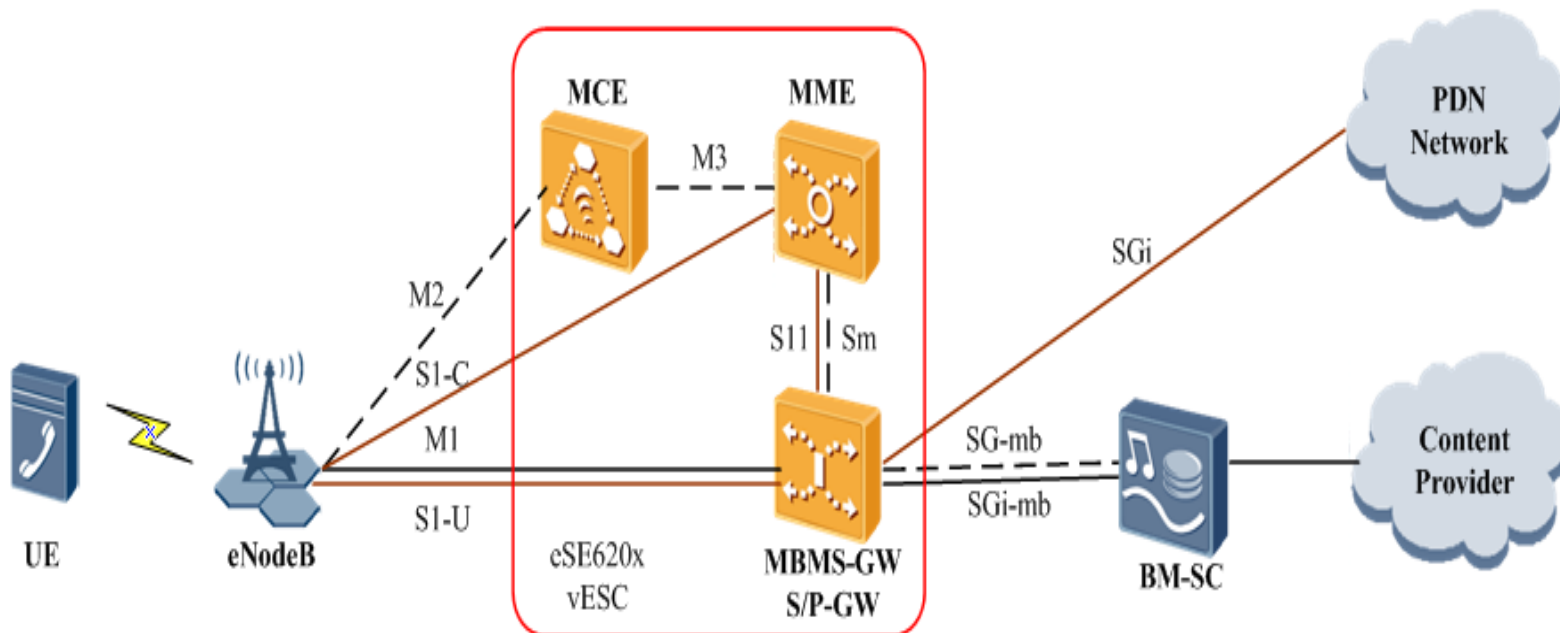
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eSE620X vESC Function Software Structure

The eSE620X vESC software uses a distributed structure and the software function modules are distributed on different boards or servers. In addition, the software can be configured flexibly according to the networking requirements.

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eSE620X vESC Function Software Structure

eSE620X vESC function software structure
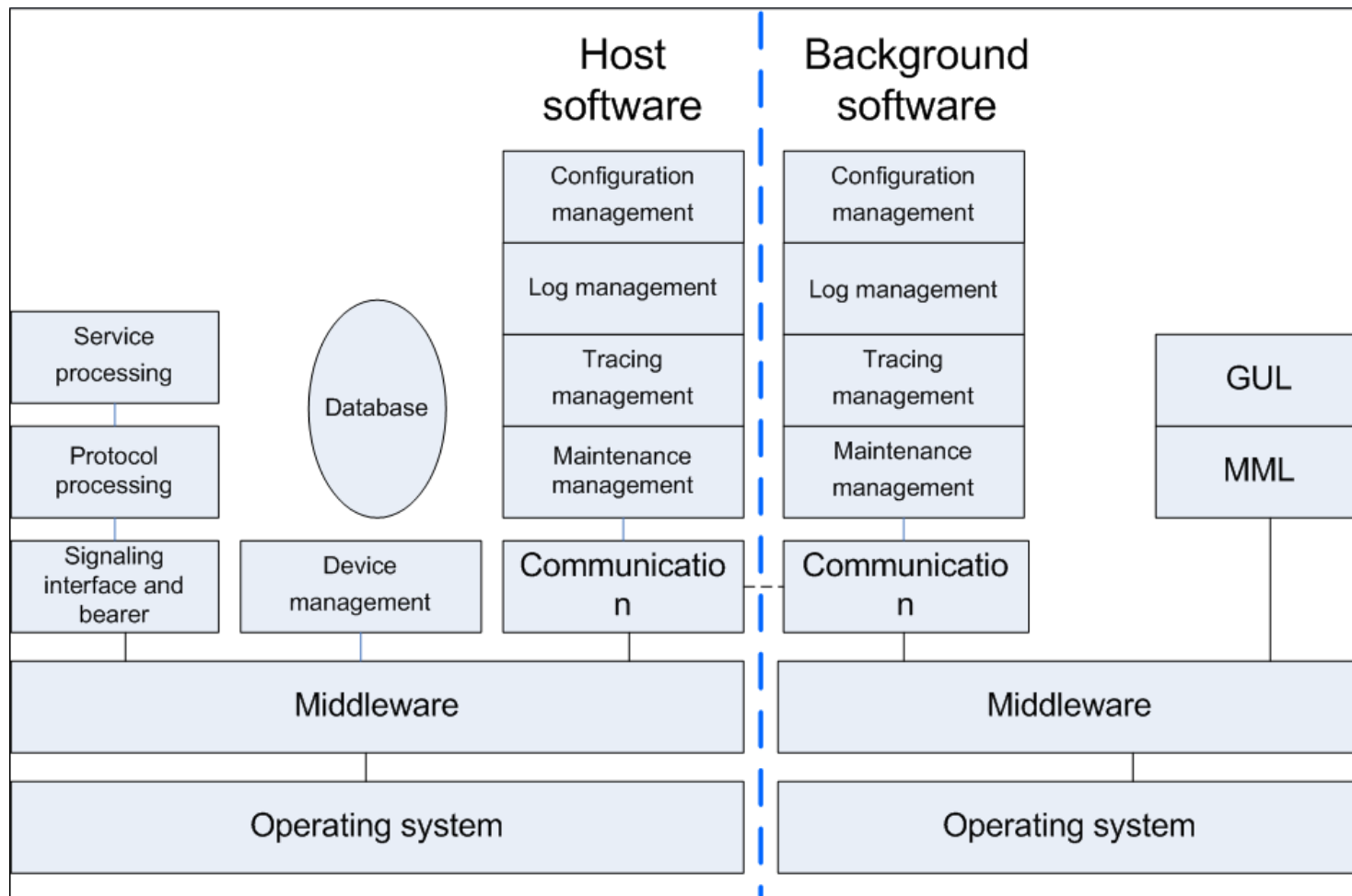
Host Software

- The host software runs on the SIGMA hardware platform. It provides functions, such as signaling access and processing, service control, and resource management. In response to specific commands, the host software works with the background software to perform the following operations, such as data management, device management, alarm management, and signaling tracing, on the host.
- The host software uses a hierarchical and modular design. From bottom to top, its components are the operating system, middleware, and various applications.

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Background Software

- The background software runs on the OMU and Web LMT. The background software provides the man-machine interface, which enables the maintenance personnel to provide functions, such as data management, device management, alarm management, performance measurement, signaling tracing, and CDR management, on the host in cooperation with the host software.

- The background software uses the client/server model and consists of the OMU server software and Web LMT software. The OMU server software is installed on the OMU. The Web LMT software is installed on the PC that serves as the client.

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OMU Server Software

- Relationship among the OMU server software, Linux, and Oracle
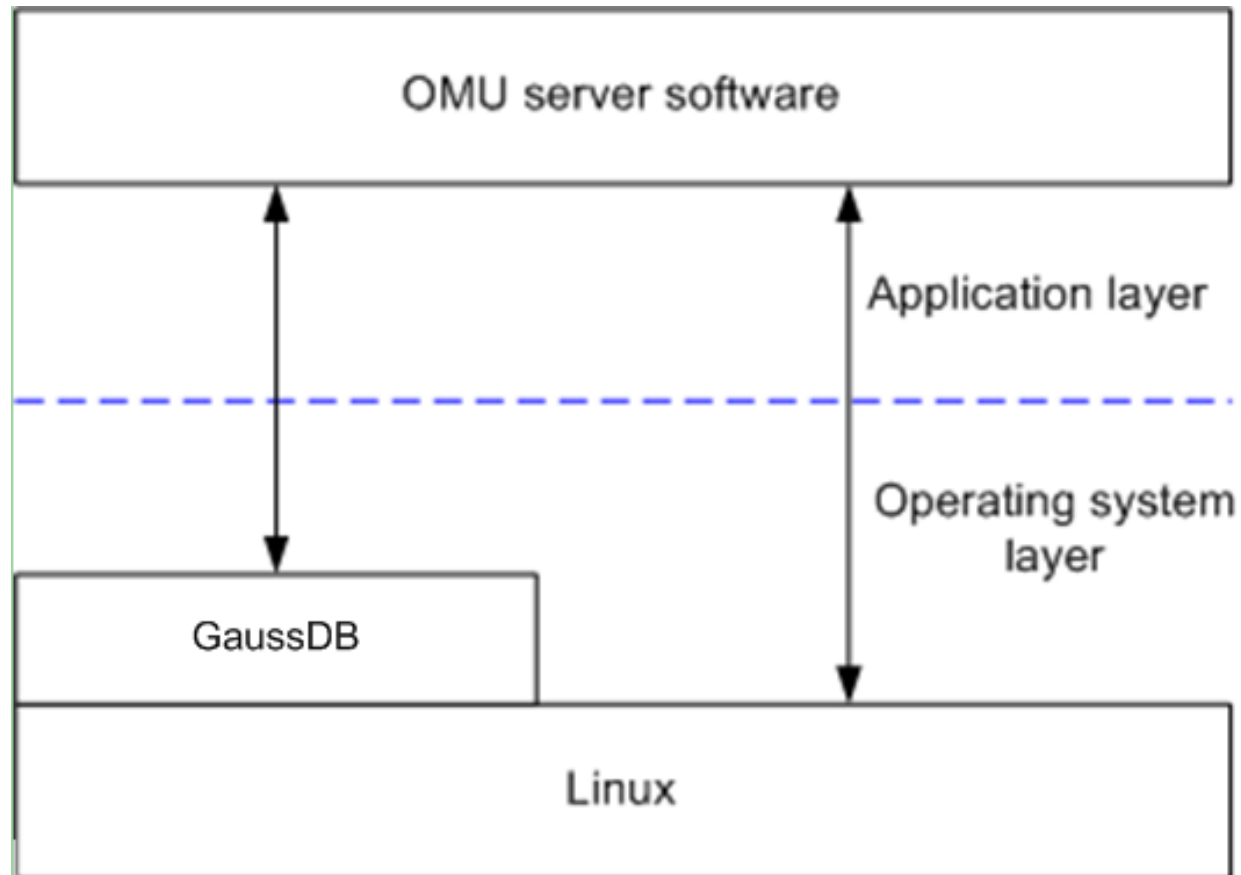
Web LMT Software

- The Web LMT software runs on the workstations and is connected to the OMU as the client in client/server model. The Web LMT software provides users with man-machine language (MML)-based graphs. A workstation can be located locally or remotely. For example, a remote workstation can be connected to the OMU server through a wide area network (WAN) in dial-up mode.

- In addition, you can perform the following maintenance functions on a workstation: data maintenance, device management, alarm management, performance measurement, call tracing, and signaling tracing.

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Introduction to Subracks

The eSE620X vESC uses the 3 U F8002 subrack (used for the eSE6203 vESC) or the 1 U F8001 subrack (used for the eSE6201 vESC).

Appearance of the F8002 Subrack

- Each F8002 subrack provides six front slots and four rear slots. The multi-function switch boards (MSXs) and service boards are installed in the front slots. AC PSUs and fan modules are installed in the rear slots.

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Technical Specifications of the F8002 Subrack

| Item		Specifications
Mechanical specifications	Dimensions (H x W x D)	130.5 mm x 442.0 mm x 675.0 mm (5.14 in. x 17.40 in. x 26.57 in.)
	Weight of an empty subrack	20.8 kg (45.86 lb) (An empty subrack is equipped with two fan trays and two AC PSUs.)
	Weight of a fully loaded subrack	47.8 kg (105.38 lb)
Power supply specifications	Rated input voltage	AC: 200 V to 240 V High-voltage DC: 240 V
	Maximum input voltage	AC: 176 V to 264 V High-voltage DC: 192 V to 288 V
	Total power inputs	Two
	Rated input current	10 A/power input
	Power rating	2000 W (The rated power of each AC PSU is 2000 W) NOTE: The subrack is configured with two AC PSUs in 1+1 redundancy mode.

Technical Specifications of the F8002 Subrack

Item		Specifications
Environmental specifications	Temperature	●Operating temperature: 0°C to 40°C (32°F to 104°F) ●Storage temperature: -40°C to +70°C (-40°F to +158°F)
	Humidity	●Long-term operating humidity: 5% RH to 85% RH (non-condensing) ●Short-term operating humidity: 5% RH to 95% RH (non-condensing) ●Storage humidity: 10% RH to 95% RH (non-condensing) Note: Short term means that the consecutive working period is not more than 96 hours and that the cumulative working period over a year is not more than 15 days.
	Altitude	-60 m to +4000 m

Functions of an F8002 Subrack

| Function	Description
Power supply	Two AC power supply units (PSUs) are configured in 1+1 redundancy mode. Each AC PSU supplies DC power to the entire subrack through the backplane.
Data transmission	The F8002 subrack provides data transmission channels.
Heat dissipation	Two fan trays are configured to dissipate heat for the subrack.
Subrack identification	Each F8002 subrack has a unique number.

F8002 Subrack Slot Positions

- Slots 2 and 5 for MSXs

- Slots 1, 3, 4, and 6 for service boards

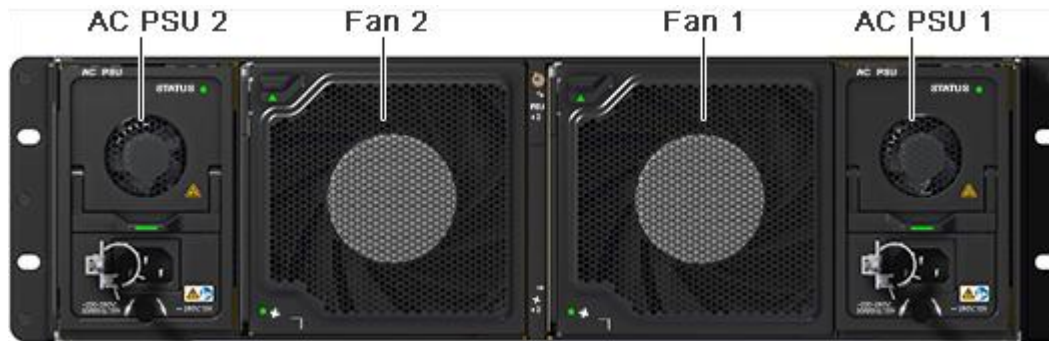- PSU 1 and PSU 2 for AC PSUs

- Fan 1 and Fan 2 for fan trays
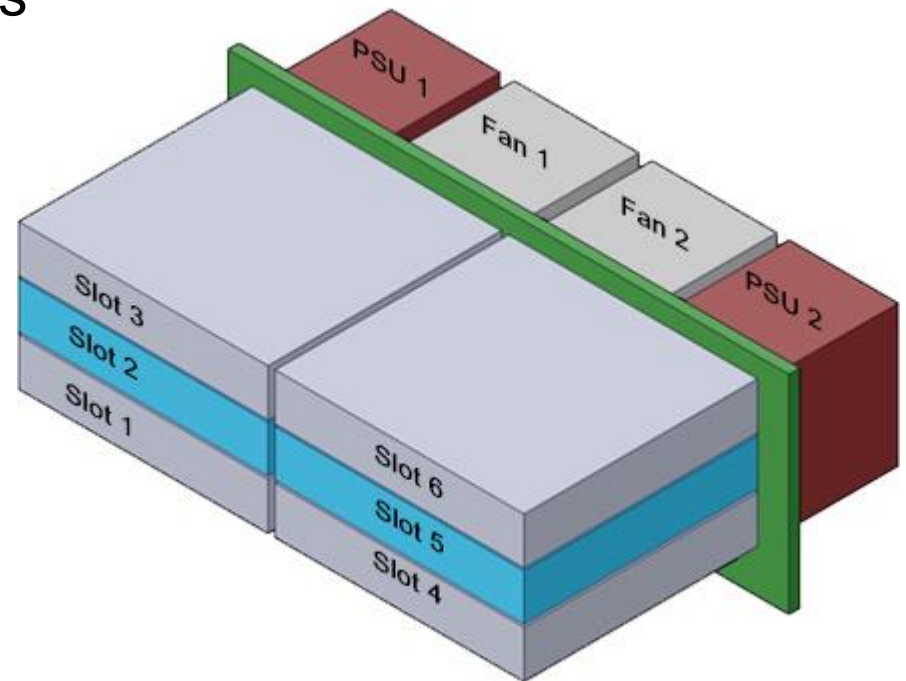
Front and Rear Views of an F8002 Subrack

- Front view of an F8002 subrack in full configuration
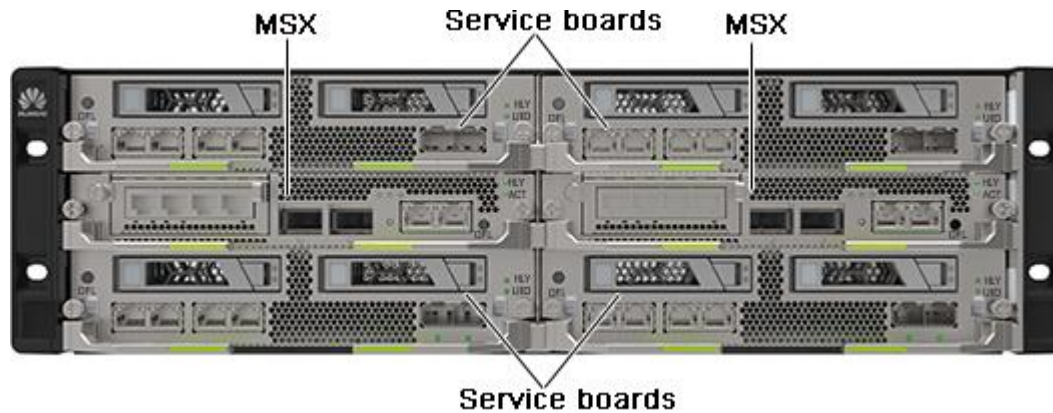
- Rear view of an F8002 subrack

Description of F8002 Subrack Components

Component	Quantity	Description
MSXs	2	The MSXs implement operation, maintenance, and management of the system. Two MSXs are installed in slots 2 and 5 to work in active/standby mode.
Service boards	4	The service boards can be installed in slots 1, 3, 4, and 6. The service boards in any two slots can be configured in active/standby mode.
AC PSUs	2	Two AC PSUs are configured in 1+1 redundancy mode. If one AC PSU is faulty, the power supply to the subrack is not affected.
Fan trays	2	Two fan trays are configured to perform heat dissipation for the components in the subrack. The fans draw in cool air from the front of the subrack and exhaust warm air from the rear of the subrack for heat dissipation of the subrack. The fans draw in cool air from the side panels of the subrack and exhaust warm air from the rear of the subrack for heat dissipation of the AC PSUs.

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Heat Dissipation in the F8002 Subrack
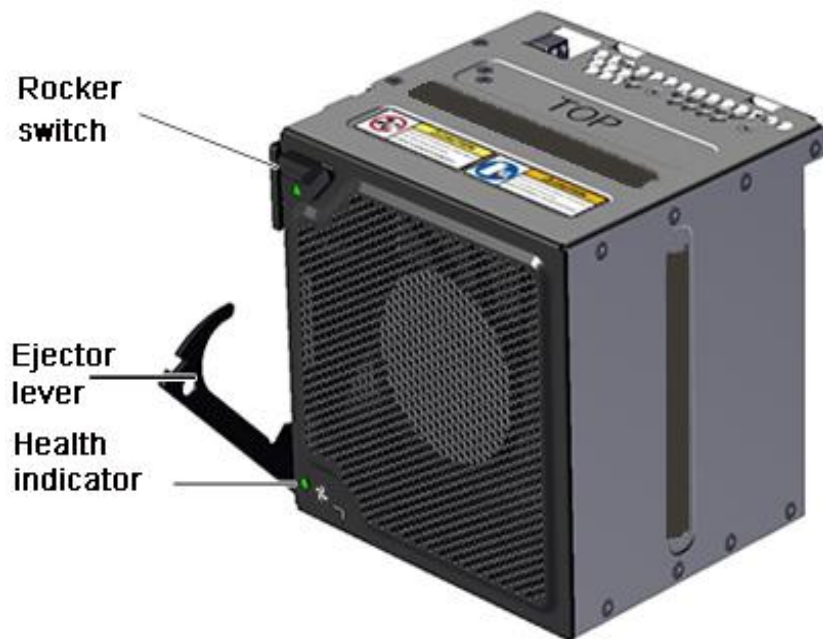
AC PSU of an F8002 Subrack

- The functions of the AC PSU include power supply, power distribution monitoring and protection.

State	State Description
Off	There is no power supply.
Steady green	The AC PSU is operating properly.
Blinking green (blinking at 0.5 Hz)	The PSU is in the hibernation state and supplies no power.
Blinking green (blinking at 4 Hz)	The PSU software is being loaded.
Steady red	•The input voltage is not within the normal range. •The output voltage is not within the normal range. •An output overcurrent or short circuit fault is occurring. •The AC PSU temperature reaches the threshold. •An AC PSU fan is faulty. •The storage devices are faulty.

Fan Tray of an F8002 Subrack

- The functions of the fan tray include heat dissipation, monitoring, speed adjustment, and hot swap.

| State	State Description
Off	The fan monitoring module is not powered on.
Blinking green	•Blinking at 0.5 Hz: The fan tray is operating properly, and the communication is normal. •Blinking at 4 Hz: The fan tray is operating properly, but the communication is abnormal.
Steady orange	The fan monitoring module is powered on, but the hardware is abnormal.
Blinking red	Blinking at 0.5 Hz: An alarm is generated for the fan tray.

Technical Specifications of the Fan Tray

Item		Specifications
Mechanical specifications	Dimensions (H x W x D)	124.5 mm x 131.0 mm x 124.7 mm (4.90 in. x 5.16 in. x 4.91 in.)
	Weight	1.7 kg (3.75 lb)
Electrical specifications	Total power inputs	Two power inputs are provided by the backplane in the subrack.
	Maximum power consumption	90 W
	Typical power consumption	20 W
Environmental specifications	Temperature	Long-term operating temperature: 0°C to 70°C (32°F to 158°F) Storage temperature: -40°C to +70°C (-40°F to +158°F)
	Noise	66 dBA

Logical Structure of the F8002 Subrack
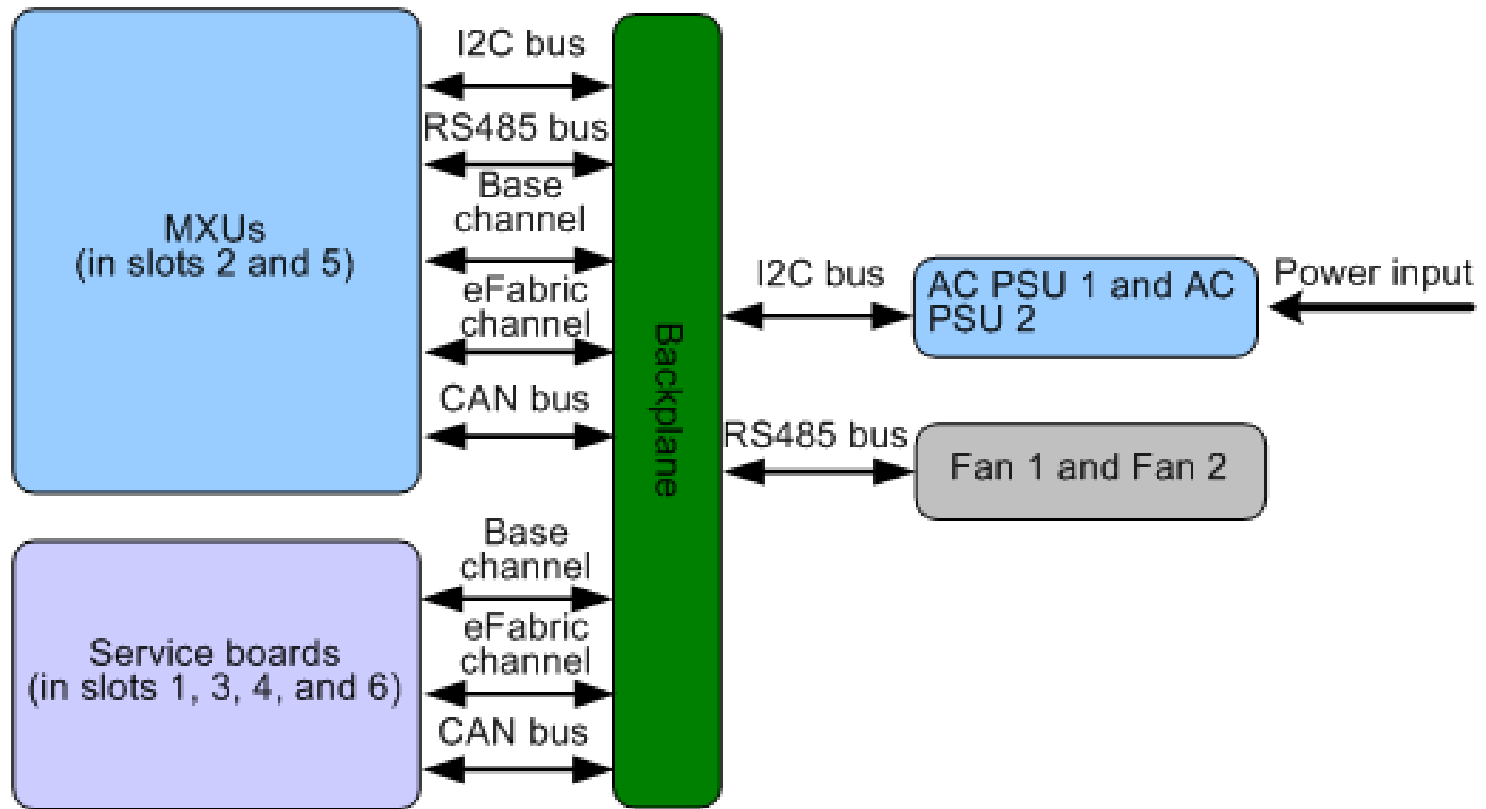
MSX

- The MSXs are half-width boards and can be installed in front slots 2 and 5 in the F8002 subrack.

- MSX boards provide operation and maintenance, network switching, device management, and storage functions.
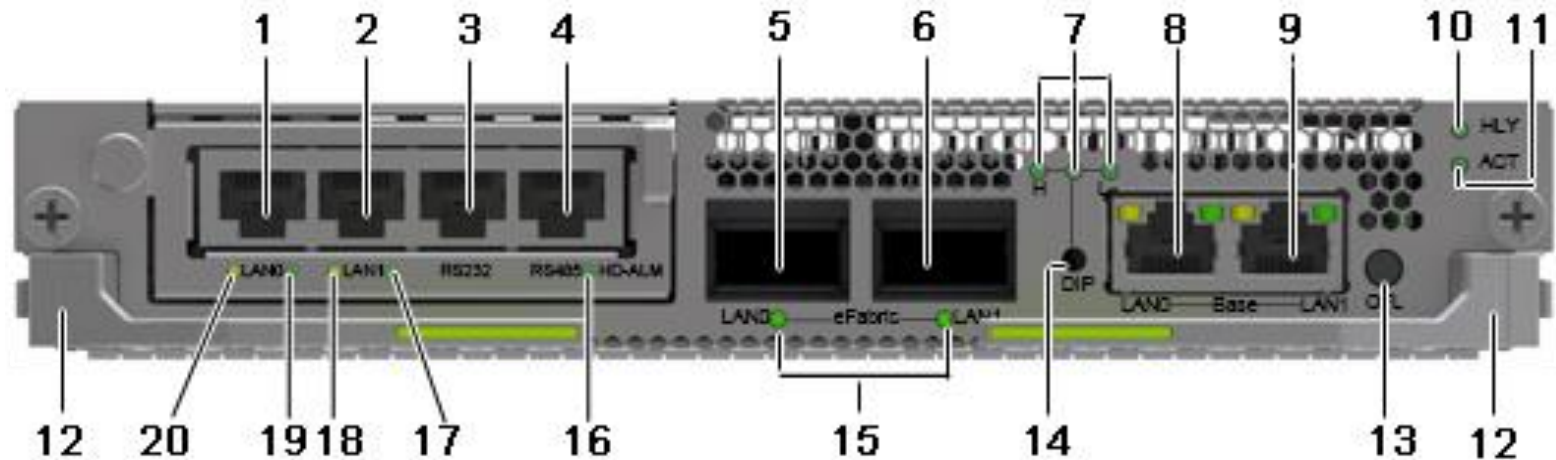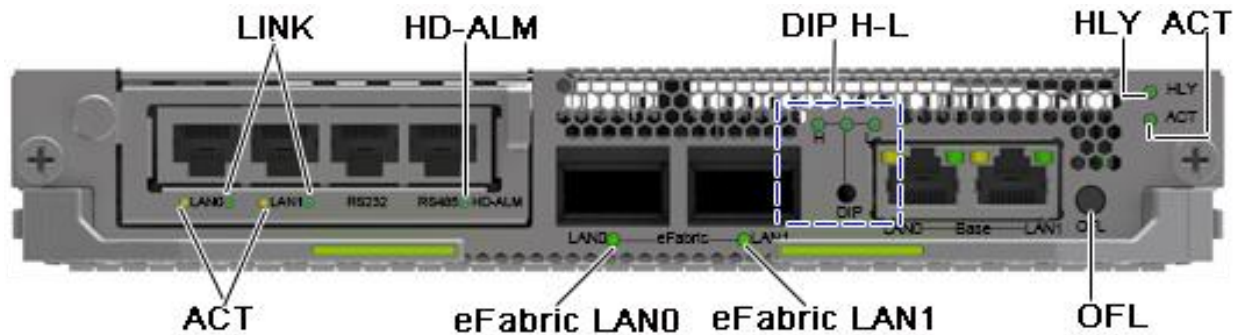
Panel Port Description of MSXs

Silk Screen	Meaning	Port Type	Standards
LAN0/LAN1	O&M network port	RJ45	10/100/1000BASE-T
RS232	System commissioning serial port	RJ45	RS232
RS485	Power distribution monitoring serial port	RJ45	RS485
eFabric LAN0/LAN1	Cascading port for the eFabric plane	Quad Small Form-factor Pluggable Plus (QSFP+)	40GBASE-SR4
Base LAN0/LAN1	Cascading port of the Base plane	RJ45	10/100/1000BASE-T

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Description of Indicators and Buttons on the MSX Board

- Indicators and buttons

Description of Indicators and Buttons on the MSX Board

Silk Screen	Meaning	State	State Description
HLY	Health indicator	Off	The board is not powered on.
		Steady green	The board is operating properly.
		Blinking red	An alarm is generated. •Blinking at 0.5 Hz: indicates a minor alarm. •Blinking at 1 Hz: indicates a major alarm. •Blinking at 4 Hz: indicates a critical alarm.
ACT	Active/standby indicator	Off	The SMM is in standby mode.
		Steady green	The SMM is in active mode.

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Description of Indicators and Buttons on the MSX Board

Silk Screen	Meaning	State	State Description
HD-ALM	Hard disk fault indicator	Off	The hard disk is operating properly.
		Steady red	The hard disk is faulty.
OFL	Offline indicator	Off	The GPC is operating properly.
		Blinking blue	The GPC is sending a request for power-on or power-off, or the GPC is being powered on or off.
		Steady blue	The GPC is powered off. You can remove the board at the time.
	Offline button	-	•To safely power off the GPC, hold down this button for six seconds til the OFL indicator is blinking blue. When the OFL indicator is blinking blue, the GPC is in the graceful power-off state. When the OFL indicator is steady blue, the GPC is powered off. •To forcibly power off the GPC, hold down this button for six seconds when the GPC is in the graceful power-off state. •To power on the GPC, hold down this button for more than 0.5 second.

Description of Indicators and Buttons on the MSX Board

Silk Screen	Meaning	State	State Description
DIP/H-L	Button/Indicators for setting a subrack number	Off	An indicator in the off state stands for the binary digit 0.
		Blinking green at 2 Hz	If the subrack number indicators are blinking at 2 Hz in sequence, the indicators are in test mode. The indicators are in test mode when: •The DIP button is pressed. •The subrack number is not obtained after the board is powered on or reset.
		Blinking green at 4 Hz	If the subrack number indicators are blinking at 4 Hz, the subrack number 0 is being set. After the subrack number is set to 0, the indicators turn off.
		Blinking green at 1 Hz	If the subrack number indicators are blinking at 1 Hz, the subrack number is being set to a number between 1 and 7. An indicator in this state stands for the binary digit 1.

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Description of Indicators and Buttons on the MSX Board

| Silk Screen	Meaning	State	State Description
DIP/H-L	Button/Indicators for setting a subrack number	Steady green	An indicator in the on state stands for the binary digit 1. To set the subrack number, hold down the DIP button for six seconds til the indicators enter the setting mode, press the DIP button to set the subrack number, and then hold down the DIP button for six seconds to complete the setting. Binary numbers 000 to 111 indicate subrack numbers 0 to 7 respectively. Note: The subrack number can be set only on the active SMM. The standby SMM only supports the indicator test mode. If you do not press the DIP button within 30 seconds after the indicators enter the setting mode, the indicators exit the setting mode without saving the settings. Each time you press the DIP button, the subrack number is incremented by 1. The subrack number restarts from 0 after it passes 7.
ACT	Network port indicator	Off	The port is not sending or receiving data.
		Blinking yellow	The port is sending or receiving data.

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Description of Indicators and Buttons on the MSX Board

Silk Screen	Meaning	State	State Description
LINK	Network port indicator	Steady green	The link is connected.
		Off	The link is faulty or disconnected.
eFabric LAN0/LAN1	Indicator of the cascading port of the eFabric plane	Off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Blinking green	The port is sending or receiving data.
Base LAN0/LAN1	Indicator of the cascading port of the Base plane	Green off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Yellow off	The port is not sending or receiving data.
		Blinking yellow	The port is sending or receiving data.

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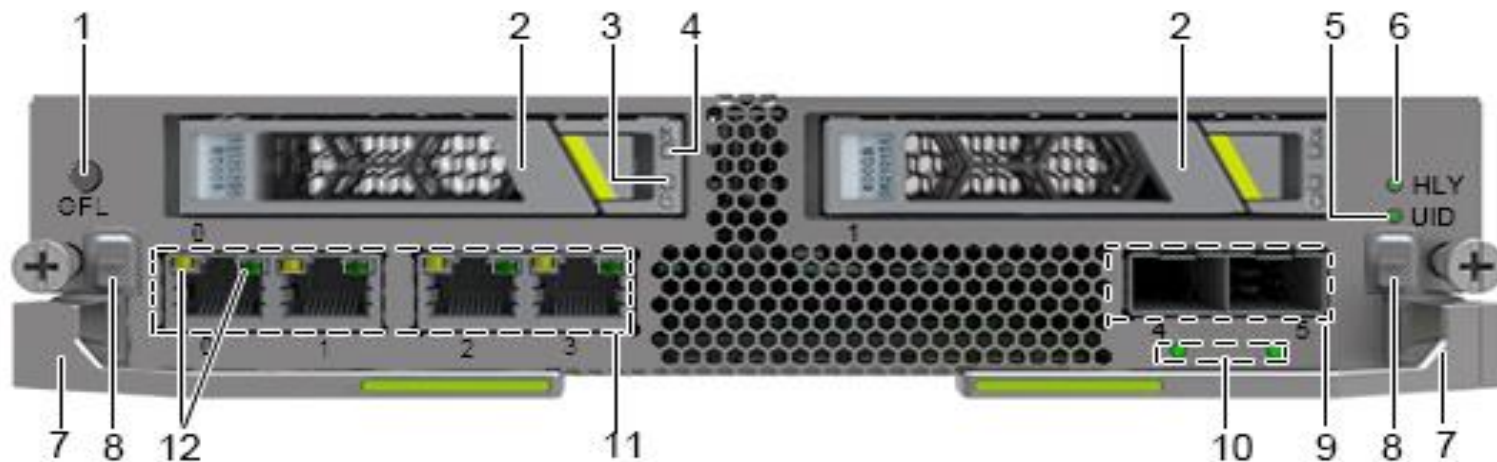# Technical Specifications of the MSX

Item		Specifications
Mechanical specifications	Dimensions (H x W x D)	35.1 mm x 205.0 mm x 531.0 mm (1.38 in. x 8.07 in. x 20.91 in.)
	Weight	3.7 kg (8.16 lb)
Electrical specifications	Maximum power consumption	125 W
	Typical power consumption	105 W
	Power supply	Two -48 V DC power supplies (provided by the backplane)
Environmental specifications	Temperature	•Long-term operating temperature: 0°C to 45°C (32°F to 113°F) •Short-term operating temperature: -5°C to +55°C (23°F to 131°F) •Storage temperature: -40°C to +70°C (-40°F to +158°F) •Temperature change rate: 15°C/h (27°F/h)
	Humidity	•Long-term operating humidity: 5% RH to 85% RH (non-condensing) •Short-term operating humidity: 5% RH to 95% RH (non-condensing)

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Logical Structure of the MSX
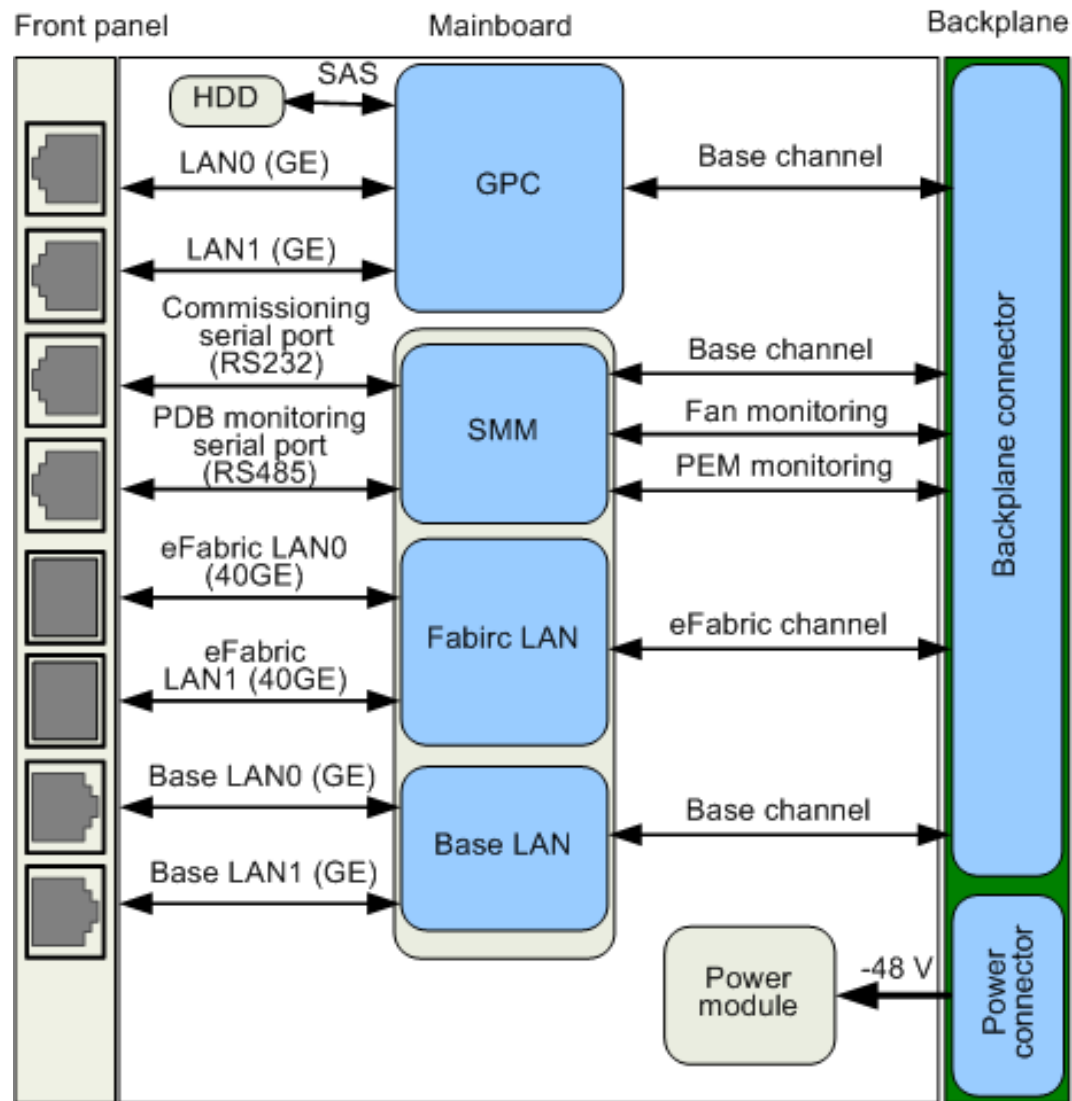
GPU

- The GPUs provide powerful computing capability for the vESC. The GPUs are half-width boards and installed in the front service board slots of the subrack.

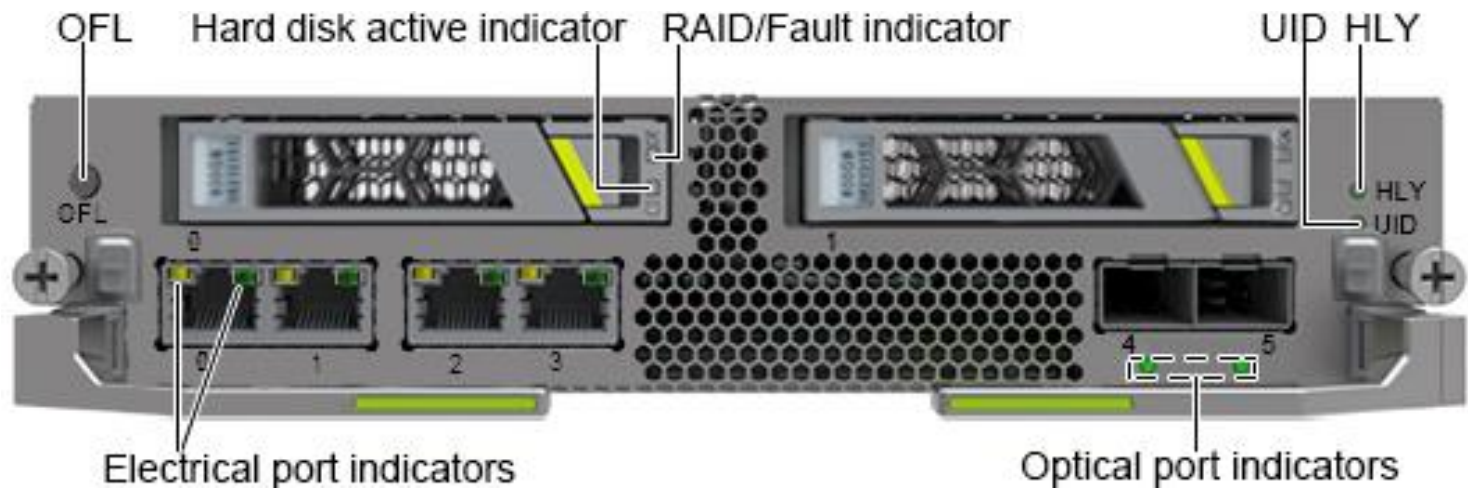- The GPUs provide service processing, interfacing, storage, and management functions.

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Panel Port Description of the GPU

Silk Screen	Meaning	Port Type	Standards
0, 1, 2, 3	GE electrical ports	RJ45	10/100/1000BASE-T
4, 5	Optical ports 4 and 5: support 10GE and GE optical ports	•10GE optical ports: SFP+ •GE optical ports: SFP	•10GE optical ports: 10GBASE-SR/LR/ER/ZR •GE optical ports: 1000BASE-SX/LH/EX/ZX

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Indicators and Buttons of the GPU

- Indicators and buttons

Indicators and Buttons of the GPU

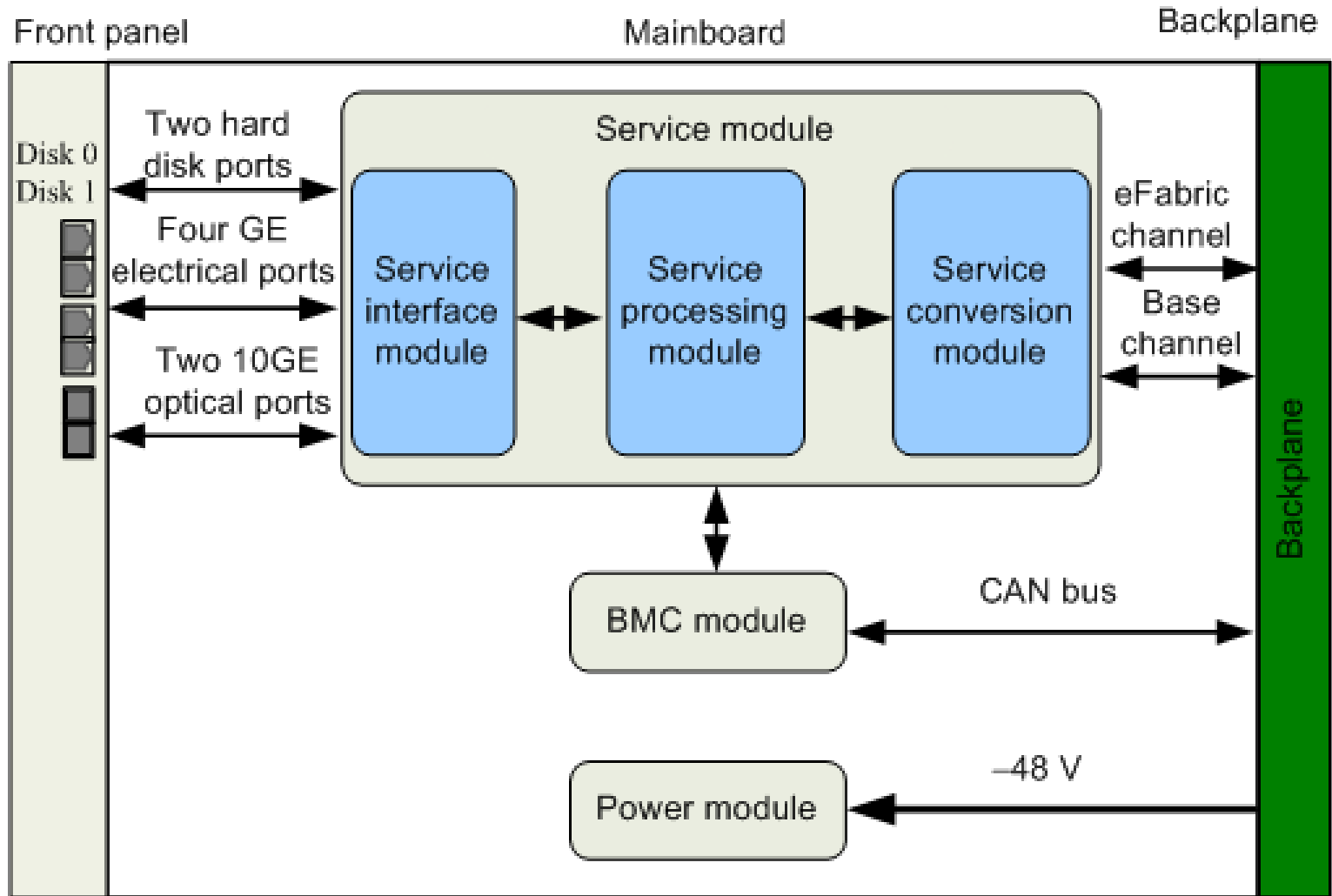| Silk Screen	Meaning	State	State Description
HLY	Health indicator	Off	The board is not powered on.
		Steady green	The board is operating properly.
		Blinking red	An alarm is generated. •Blinking at 0.5 Hz: indicates a minor alarm. •Blinking at 1 Hz: indicates a major alarm. •Blinking at 4 Hz: indicates a critical alarm.
UID	Location indicator	Off	The indicator is used to locate a device to be operated. You can customize the function of this indicator.
		Steady green	
		Blinking green	

Indicators and Buttons of the GPU

Silk Screen	Meaning	State	State Description
OFL	Offline indicator	Off	The board is operating properly.
		Blinking blue	The board is sending a request for power-on or power-off, or the board is being powered on or off.
		Steady blue	The board is powered off. You can remove the board at the time.
	Offline button	-	•To safely power off the board, hold down this button for six seconds til the OFL indicator is blinking blue. When the OFL indicator is blinking blue, the board is in the graceful power-off state. When the OFL indicator is steady blue, the board is powered off. •To forcibly power off the board, hold down this button for six seconds when the board is in the graceful power-off state. •To power on the board, hold down this button for more than 0.5 second.
-	Optical port indicator	Off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Blinking green	The port is sending or receiving data.

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Indicators and Buttons of the GPU

Silk Screen	Meaning	State	State Description
-	Electrical port indicator	Green off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Yellow off	The port is not sending or receiving data.
		Blinking yellow	The port is sending or receiving data.
(icon)	RAID/Fault indicator	Off	The indicator is invalid and off.
(icon)	RAID/Fault indicator	Off	The hard disk is operating properly.
		Blinking green	RAID is being rebuilt on the hard disks.
		Steady red	The hard disk is faulty.
(icon)	Hard disk active indicator	Off	The hard disk is inactive.
		Blinking green	Data is being read from or written to the hard disk.

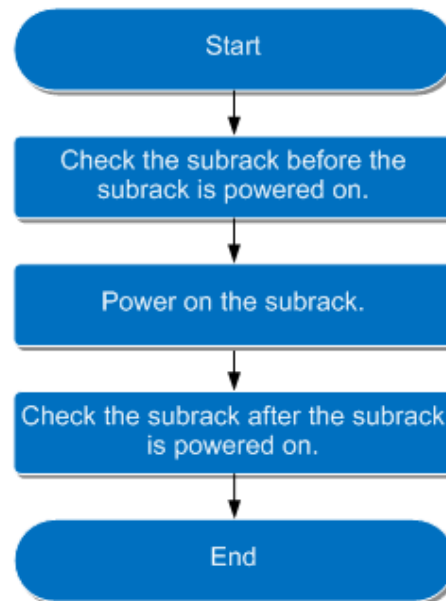HUAWEI

Logical Structure of the GPU

Powering On the F8002 Subrack

- **Prerequisites**

  The PSUs in the subrack are correctly connected to the power distribution box (PDB) in the cabinet through power cables.

  You are familiar with the mapping between the switches on the PDB and the devices in the cabinet.

- **Process for powering on the F8002 subrack**

```
        Start
          |
          v
Check the subrack before the
subrack is powered on.
          |
          v
Power on the subrack.
          |
          v
Check the subrack after the subrack
is powered on.
          |
          v
         End
```
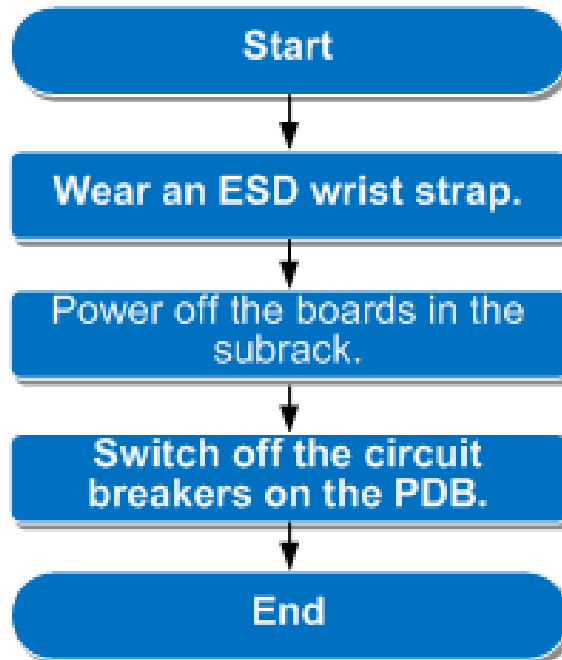
Powering Off the F8002 Subrack

- **Prerequisites**

  You are familiar with the mapping between the switches on the PDB and the devices in the cabinet.

- **Process for powering off the F8002 subrack**

Introduction to an F8001 Subrack

The **highly-configured 1 U subrack** does not need service boards and we cannot expand its capacity by adding new boards. It can support at most 10,000 subscribers.

Technical Specifications of the F8001 Subrack

| Item		Specifications
Mechanical specifications	Dimensions (H x W x D)	43.6 mm x 442.0 mm x 310.0 mm (1.72 in. x 17.40 in. x 12.20 in.)
	Weight	7.1 kg (15.66 lb)
Power supply specifications	Rated input voltage	100 V to 240 V AC
	Maximum input voltage	90 V to 290 V AC
	Rated input current	8 A
	Frequency	50 Hz/60 Hz AC
	Power input	One
Power consumption	Maximum power consumption	240 W (818.9 BTU/hr)
	Typical power consumption	205 W (699.5 BTU/hr)

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Technical Specifications of the F8001 Subrack

Item		Specifications
Environmental specifications	Temperature	●Long-term operating temperature: 0°C to 45°C (32°F to 113°F) ●Short-term operating temperature: -5°C to +55°C (23°F to 131°F) ●Storage temperature: -40°C to +70°C (-40°F to +158°F)
	Operating humidity	5% RH to 95% RH (non-condensing)
	Altitude	-60 m to +4000 m
	Operating atmospheric pressure	70 kPa to 106 kPa

Functions of the F8001 Subrack

- Service processing

- Interfacing

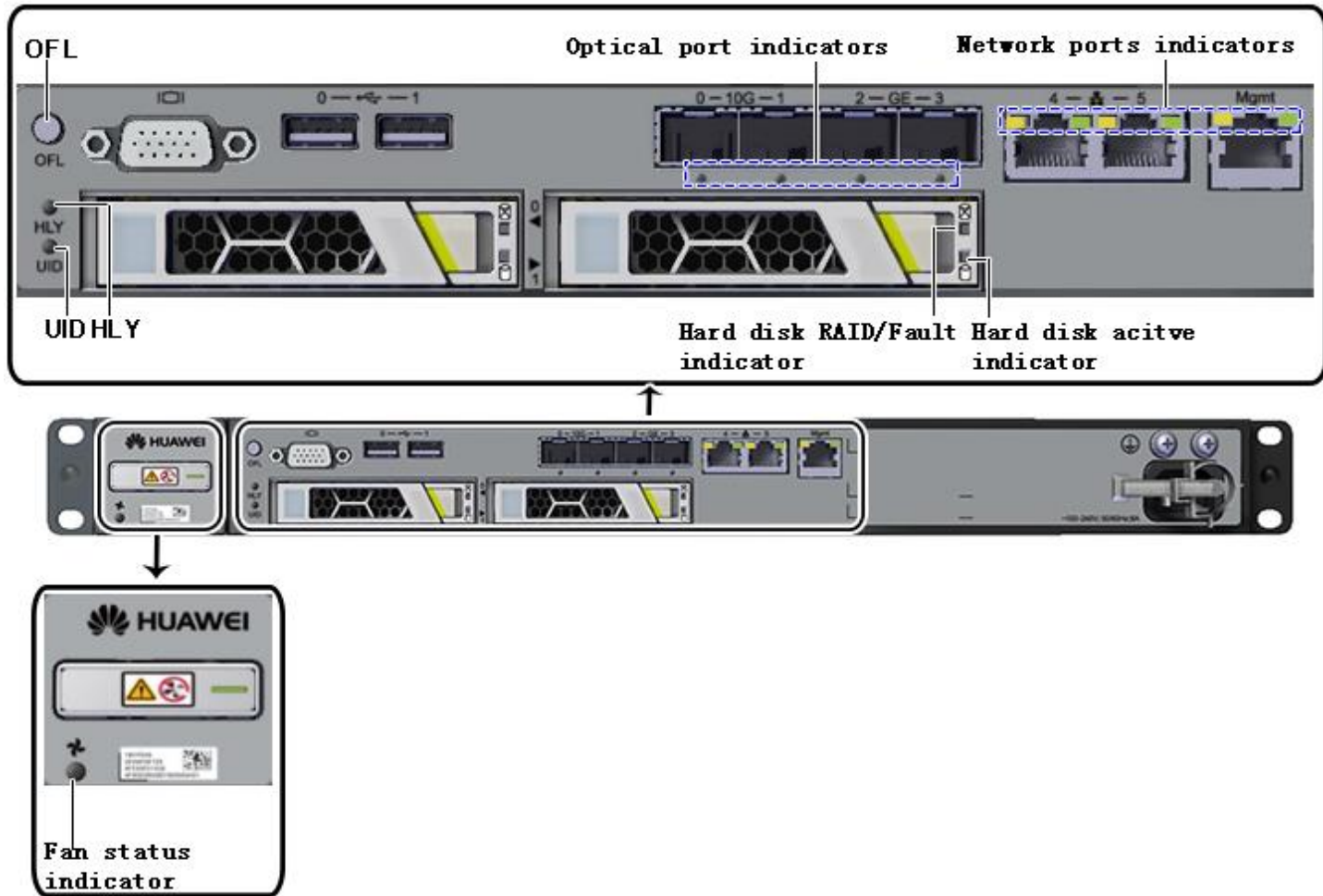- Storage

- Management

- Power supply

- Cooling

- Grounding

Front View of the F8001 Subrack
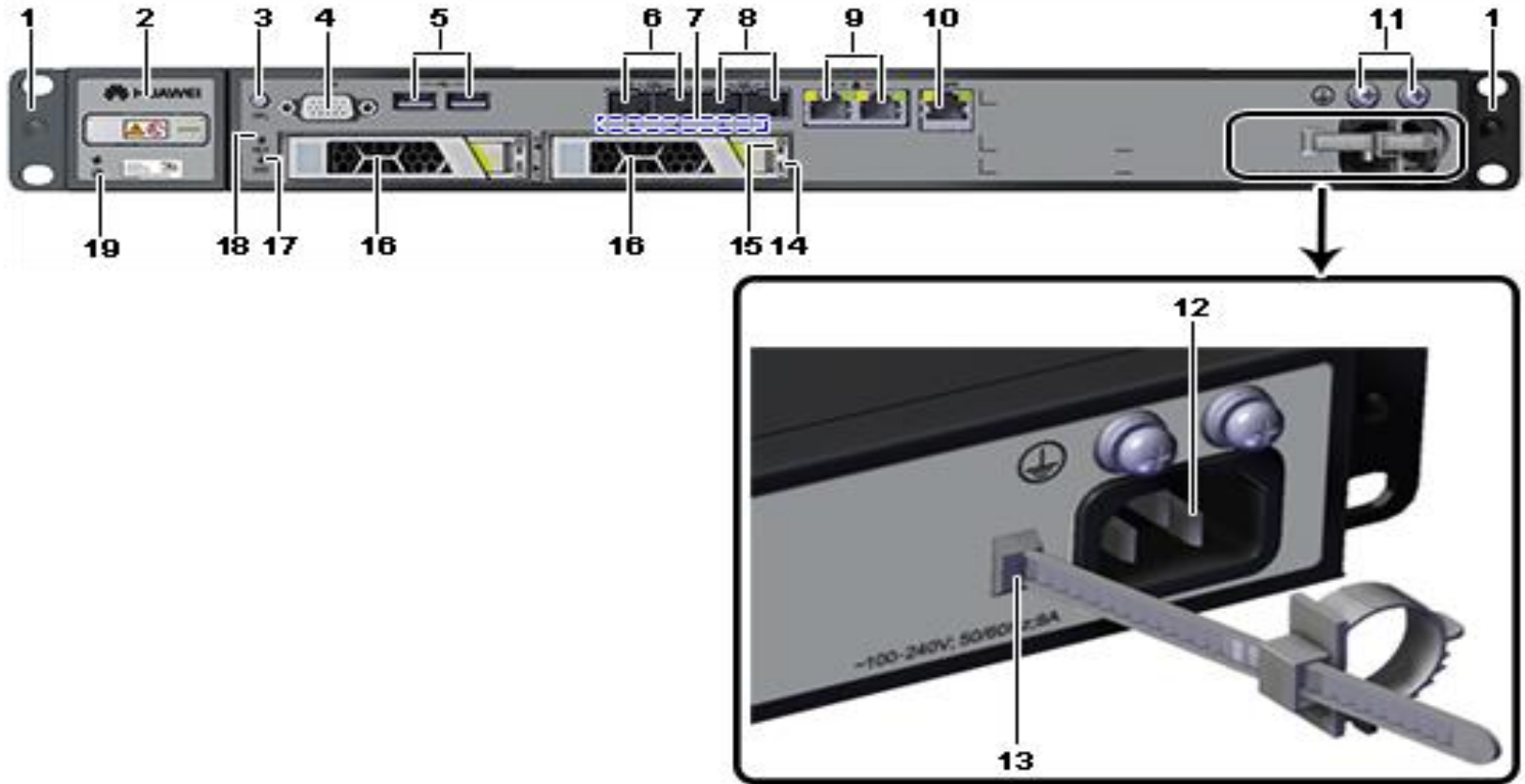
Panel Port Description of the F8001 Subrack

Silk Screen	Meaning	Port Type	Standards
I▭I (VGA symbol)	VGA port	VGA	VGA
0 — ⟜ — 1 (USB symbol)	USB(0-1)	USB 2.0	USB 2.0
0 — 10G — 1	10GE optical ports (0-1): support only 10GE optical ports	SFP+	10GBASE-SR/LR/ER/ZR
2 — GE — 3	GE optical ports (2-3): support only GE optical ports	SFP	1000BASE-SX/LH/EX/ZX
4 — ⧈ — 5 (network symbol)	GE network ports (4-5)	RJ45	100/1000BASE-T
Mgmt	Management network port	RJ45	100/1000BASE-T

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Indicators and Buttons on the F8001 Subrack

Description of Indicators and Buttons on the F8001 Subrack

Silk Screen	Meaning	State	State Description
HLY	Health indicator	Off	The subrack is not powered on.
		Steady green	The subrack is operating properly.
		Blinking red	An alarm is generated. •Blinking every 2 seconds (0.5 Hz): indicates a minor alarm. •Blinking every 1 second (1 Hz): indicates a major alarm. •Blinking four times per second (4 Hz): indicates a critical alarm. •Blinking at 0.5 Hz: indicates a minor alarm. •Blinking at 1 Hz: indicates a major alarm. •Blinking at 4 Hz: indicates a critical alarm.

Description of Indicators and Buttons on the F8001 Subrack

| Silk Screen	Meaning	State	State Description
UID	Location indicator	Off	The indicator is used to locate a device to be operated. You can customize the function of this indicator.
		Steady green	
		Blinking green	
OFL	Offline indicator	Off	The subrack is operating properly.
		Blinking blue	The subrack is sending a request for power-on or power-off, or the subrack is being powered on or off.
		Steady blue	The subrack is powered off.
	Offline button	-	•When the subrack is operating properly, hold down this button for six seconds til the indicator is blinking blue. When the indicator is blinking blue, the subrack is in the graceful power-off state. When the indicator is steady blue, the subrack is powered off. •When the subrack is in the graceful power-off state (the indicator is blinking blue), hold down this button for six seconds to forcibly power off the subrack. •When the subrack is powered off (the indicator is steady blue), hold down this button for more than 0.5 second to power on the subrack.

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Description of Indicators and Buttons on the F8001 Subrack

Silk Screen	Meaning	State	State Description
-	Optical port indicator	Off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Blinking green	The port is sending or receiving data.
-	Network port indicator	Green off	The link is faulty or disconnected.
		Steady green	The link is connected.
		Yellow off	The port is not sending or receiving data.
		Blinking yellow	The port is sending or receiving data.

Description of Indicators and Buttons on the F8001 Subrack

Silk Screen	Meaning	State	State Description
	Hard disk RAID/Fault indicator	Off	The hard disk is operating properly.
		Blinking green	RAID is being rebuilt on the hard disks.
		Steady red	The hard disk is faulty.
	Hard disk active indicator	Off	The hard disk is inactive.
		Blinking green	Data is being read from or written to the hard disk.
-	Fan status indicator	Off	The fan module is not powered on.
		Steady green	The fan module is operating properly and its communication is normal.
		Blinking red	An alarm is generated for the fan module. •Blinking every 2 seconds (0.5 Hz): indicates a minor alarm. •Blinking every 1 second (1 Hz): indicates a major alarm. •Blinking four times per second (4 Hz): indicates a critical alarm. •Blinking at 0.5 Hz: indicates a minor alarm. •Blinking at 1 Hz: indicates a major alarm. •Blinking at 4 Hz: indicates a critical alarm.

Logical Structure of the F8001 Subrack
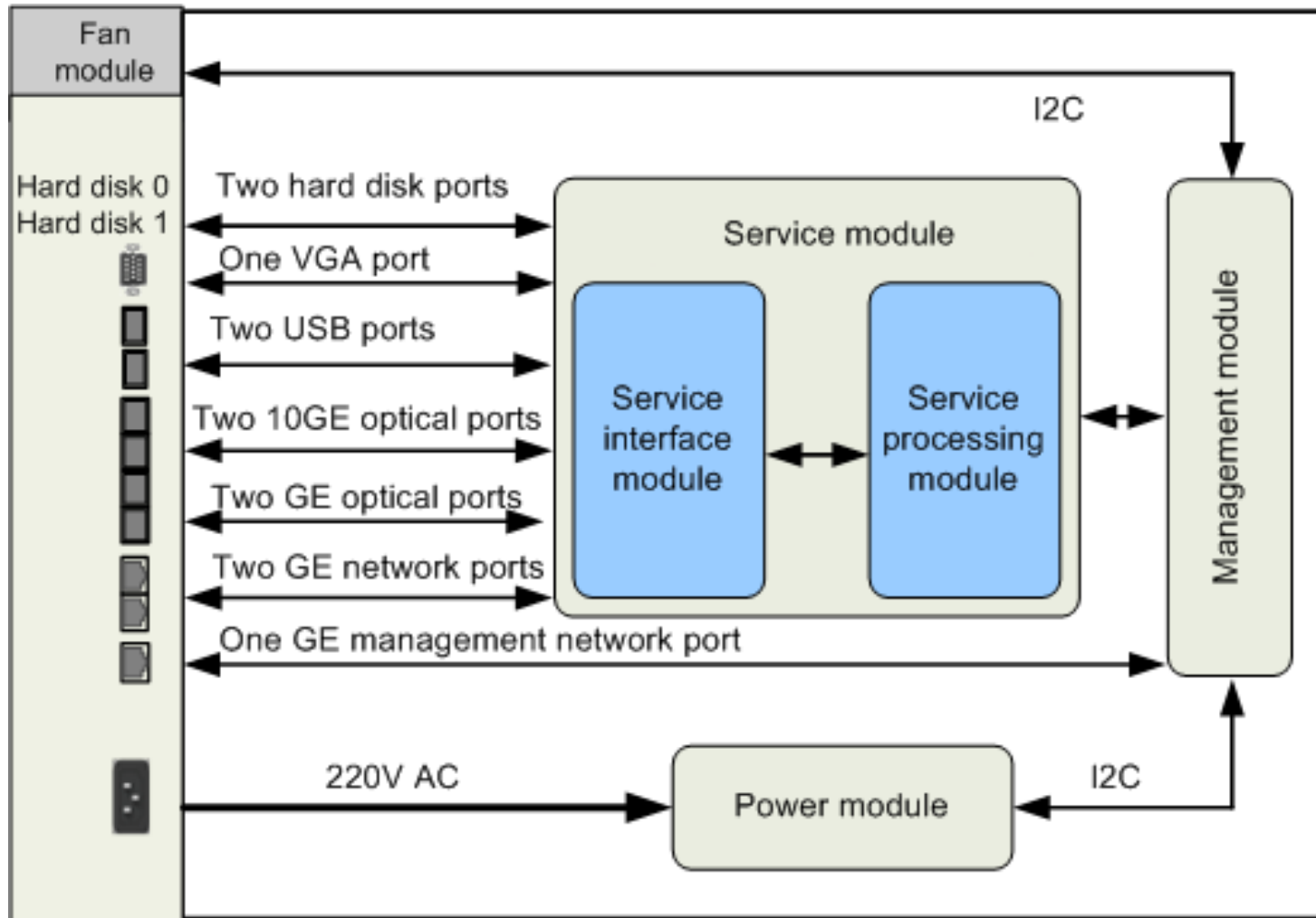
Fan Module of the F8001 Subrack

- The fan module blows air to dissipate heat for components in the subrack. The air goes in to the subrack from the left and exhausts from the right of the subrack.
- The functions of the fan tray include heat dissipation, monitoring, speed adjustment, and hot swap.

State	State Description
Off	The fan module is not powered on.
Steady green	The fan module is operating properly and its communication is normal.
Blinking red	An alarm is generated for the fan module. •Blinking at 0.5 Hz: indicates a minor alarm. •Blinking at 1 Hz: indicates a major alarm. •Blinking at 4 Hz: indicates a critical alarm.

Technical Specifications of the Fan Module

| Item		Specifications
Mechanical specifications	Dimensions (H x W x D)	43.6 mm x 49.8 mm x 295.6 mm (1.72 in. x 1.96 in. x 11.64 in.)
	Weight	0.5 kg (1.10 lb)
Electrical specifications	Power input	One power input, provided by the fan backplane
	Maximum power consumption	40.4 W
	Typical power consumption	10.5 W
Environmental specifications	Temperature	•Long-term operating temperature: -10° C to +60° C (14° F to 140° F) •Storage temperature: -40° C to +70° C (-40° F to +158° F)
	Noise	72 dBA

Powering On the F8001 Subrack

- **Prerequisites**

  The subrack and the external power supply are correctly connected using power cables.

  You are familiar with the mapping between the switches on the external power supply and the devices in the cabinet.

- **Process for powering on the F8001 subrack**
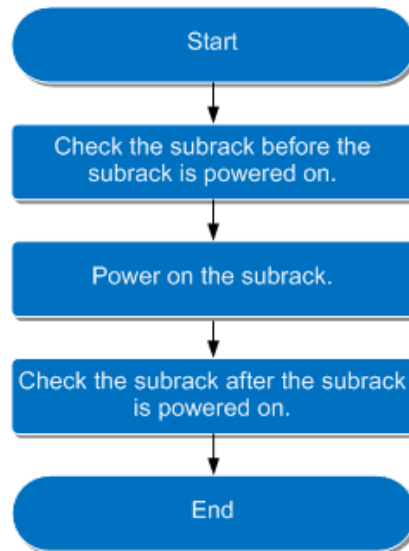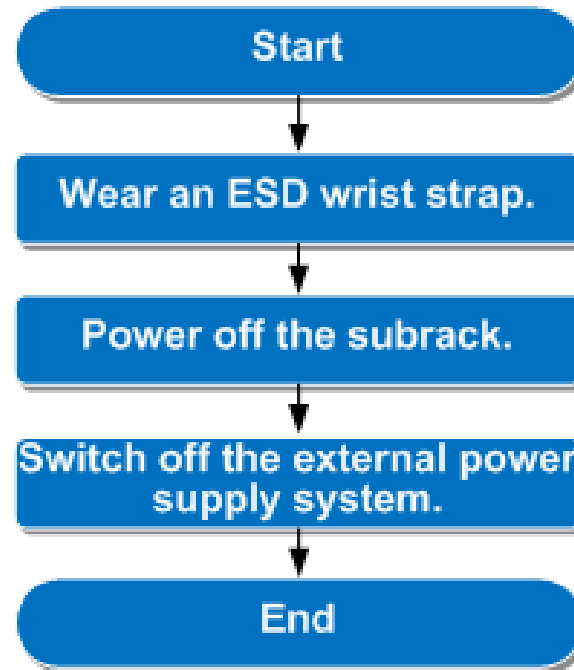
Powering Off the F8001 Subrack

- **Prerequisites**

  You are familiar with the mapping between the external power supply and the devices in the cabinet.

- **Process for powering off the F8001 subrack**

Contents

- eSE620X vESC Positioning

- eSE620X vESC Networking Architecture

- eSE620X vESC Software Structure

- eSE620X vESC Hardware Structure

- **eSE620X vESC Servers and Cables**

Power Cables to a Subrack

- A power cable connects the power input terminal on a subrack to the power output terminal on the power distribution box to supply power to the subrack.
- AC power cables include the AC power cable using the C13 straight female (SF) and the PI straight male (SM) and the AC power cable using the C13 angled female (AF) and the C14 SM. The two types of power cables differ in the power port.

AC power cable using the C13 SF and PI SM   AC power cable using the C13 AF and C14 SM

PGND Cables to a Subrack

- PGND cable with OT terminals

  Each subrack is configured with one PGND cable. The cable is yellow and green. Both ends of the PGND cable are OT terminals. The following figure shows a PGND cable with OT terminals.

- PGND cable with dual-hole JG terminals

  Each subrack is configured with one PGND cable. The cable is yellow and green. Both ends of the PGND cable are dual-hole JG terminals. The following figure shows a PGND cable with dual-hole JG terminals.

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DB9-RJ45 Serial Cable

- The DB9-RJ45 serial cable is used for data transmission. It has a DB9 connector at one end and a RJ45 connector at the other end. The DB9 connector connects to the serial port of a client, and the RJ45 connector connects to the serial port of a device.

- Appearance of a DB9-RJ45 serial cable

Network Cable

- Network cables are used for cascading devices or for communication between devices and the network. Through network cables, devices can be locally serviced and remotely accessed over the network.

- A network cable is a straight-through or crossover cable. It is made of Category 5 enhanced shielded or unshielded twisted pair cables and RJ45 connectors at both ends. The following figure shows the cable.

LC/PC-LC/PC-Single-Mode Optical Cable

- The LC/PC-LC/PC-single-mode optical cables are used to connect service boards and network elements (NEs).

- The LC/PC-LC/PC-single-mode optical cable is yellow, as shown in the following figure. Users can choose single-mode or multi-mode optical cables based on site requirements.

LC/PC-LC/PC-Multi-Mode Optical Cable

- The LC/PC-LC/PC-multi-mode optical cables are used to connect service boards and NEs.

- The LC/PC-LC/PC-multi-mode optical cable is orange, as shown in the following figure. Users can choose single-mode or multi-mode optical cables based on site requirements.

MPO/PC-MPO/PC-Multi-Mode Optical Cable

- The MPO/PC-MPO/PC-multi-mode optical cables are used to connect the optical ports on two devices for data communications.

- The MPO/PC-MPO/PC-multi-mode optical cable is cyan, as shown in the following figure.

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BITS Clock Cable

- A building integrated timing supply (BITS) clock cable connects a BITS device to a multi-function switch board to transmit BITS clock signals between them.

- A BITS clock cable uses an SMB female connector to connect to the BITS clock port on a multi-function switch board. The cable connector on the other end varies depending on the port type of the clock device to be connected.

- The MSX supports only the 75-ohm clock cable, as shown in the following figure.

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Specifications for Installing Signal Cables

- **Rules for Installing Signal Cables**

- Conduct a continuity test on each signal cable before installation. Mark or label both ends of each cable to indicate the device to be connected and the cable installation sequence. Fill in the labels correctly and attach them to the cables neatly and securely.

- Ensure that the signal cables are in good condition, without any damage or joint.

- Route and bind cables along the wire bushings.

- Do not place signal cables on heat dissipation holes. Otherwise, heat dissipation for the cabinet deteriorates, and the cable service life is shortened.

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Specifications for Installing Signal Cables

- **Rules for Installing Optical Cables**

- Do not pull, press, or squeeze optical cables during installation.

- The bending radius of an optical cable must be greater than or equal to 50 mm.

- Do not lay out other cables over optical cables after installation.

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Laying Out Signal Cables

- Signal cables are routed from the front of the subrack. Signal cables from the boards on the left side of the subrack are routed and bound on the left, and signal cables from the boards on the right side of the subrack are routed and bound on the right.

- Signal cables are routed from the front of the subrack and are routed and bound on the right.

- Use the same method to route and bind the signal cables from the boards on the right side of the subrack.

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Laying Out Signal Cables

- Routing of the signal cables from a board on the left side through a cable support
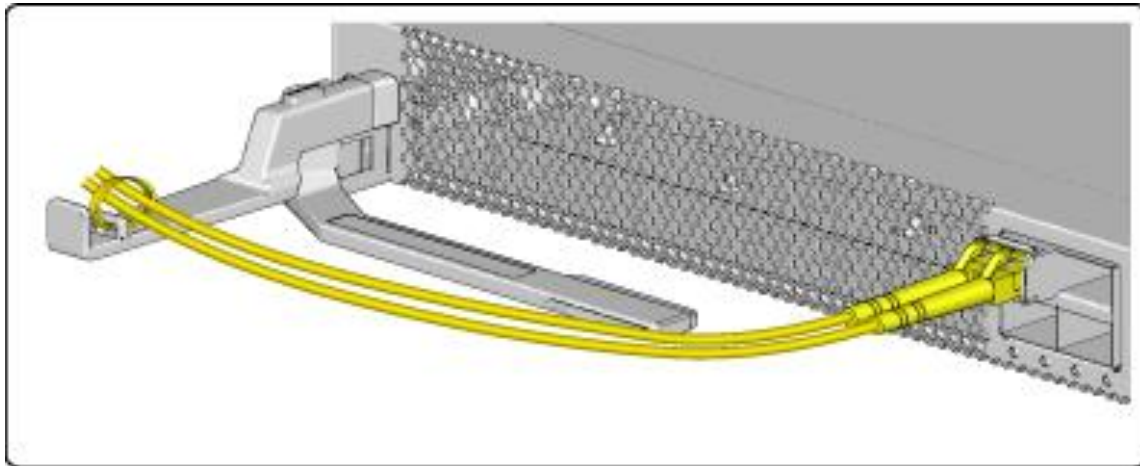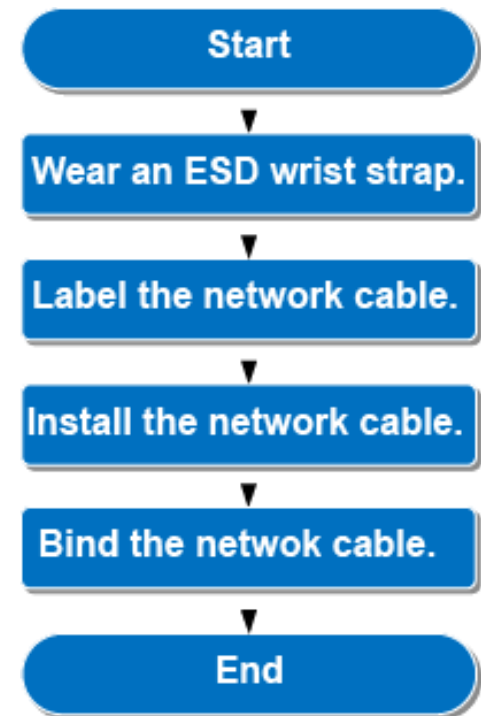
Laying Out Signal Cables

- Routing of the signal cables from a board without a cable support on the left side of the subrack

Installing an Ethernet Cable

- **Prerequisites**

- Cut the Ethernet cable based on the
  cable route to ensure that the cable is
  long enough. Then make network ports
  for the Ethernet cable.

- **Tools**

- Diagonal pliers

- Electrostatic discharge (ESD) wrist strap
  or gloves

- Cable ties

Start

▼

Wear an ESD wrist strap.

▼

Label the network cable.

▼

Install the network cable.

▼

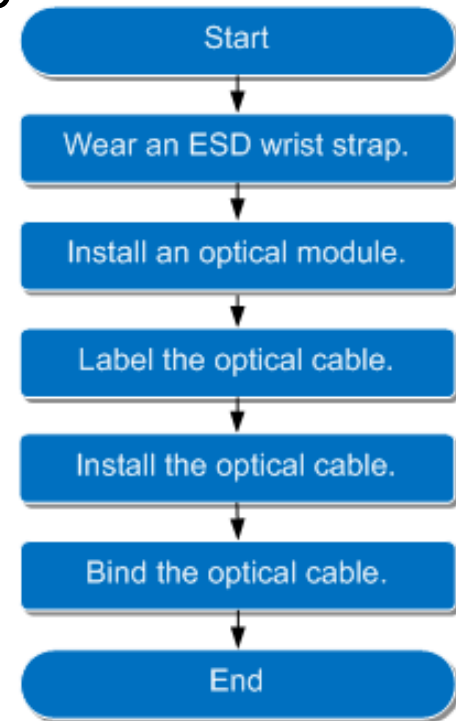**Bind the netwok cable.**

▼

End

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Installing an Optical Cable

- **Prerequisites**

- Caution: Do not look into the optical fiber outlet or any optical transceiver without eye protection.

- You are familiar with the process of installing signal cables. For details, see *Specifications for Installing Signal Cables*.

- **Tools**

- Diagonal pliers

- ESD wrist strap or gloves

- Cable ties

Start

Wear an ESD wrist strap.

Install an optical module.

Label the optical cable.

Install the optical cable.

Bind the optical cable.

End

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Summary

This course mainly includes:

- eSE620X vESC Positioning and Highlights

- eSE620X vESC Networking Architecture

- eSE620X vESC Software Structure

- eSE620X vESC Hardware Structure

- eSE620X vESC Servers and Cables

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Questions

- 1. Which of the following is the general service process unit of the eSE620X vESC? ( )

  A. GPU   B. MSX   C. VPU   D. SPU

- 2. Which of the following board is installed in front slots 2 and 5 in the F8002 subrack? ( )

  A. GPU   B. MSX   C. VPU   D. SPU

- 3. How many subscribers can be supported by the eSE620X vESC with the 1 U subrack? ( )

  A. 10,000   B. 30,000   C. 200,000   D. 600,000

Recommendations

- Huawei Learning website

  - http://support.huawei.com/learning/Index!toTrainIndex

- Huawei Support case library

  - http://support.huawei.com/enterprise/servicecenter?lang=en

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Thank You

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