



NVIDIA Skyway InfiniBand-to-Ethernet Gateway User Manual

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About this Manual

This manual describes the installation and basic use of NVIDIA Skyway™ InfiniBand-to-Ethernet gateway.

Ordering Part Numbers

The table below provides the ordering part number (OPN) for the available NVIDIA Skyway gateway.

NVIDIA SKU	Legacy OPN	Marketing Description
920-9B020-00FA-0D2	MGA100-HS2	NVIDIA Skyway InfiniBand to Ethernet Gateway Appliance, 8x IB and 8x Ethernet ports, 2U server, 8x ConnectX-6 VPI dual-port HDR/200GbE adapters, 2 power supplies (AC).

Intended Audience

This manual is intended for IT managers and system administrators.

Related Documentation


Document Name	Description
NVIDIA MLNX-GW User Manual for NVIDIA Skyway	This document contains information regarding the configuration and management of the NVIDIA Skyway (MLNX-GW) software.

Revision History

A list of the changes made to this document are provided in [Document Revision History](#).

Introduction

This is the user guide for the NVIDIA Skyway InfiniBand-to-Ethernet gateway. This document contains the complete product overview, installation and initialization instructions, and product specifications.

 This document is preliminary and subject to change.

Product Overview

NVIDIA Skyway GA100 is an appliance-based InfiniBand-to-Ethernet gateway, enabling Ethernet storage or other Ethernet-based communications to access the InfiniBand datacenter, and vice versa. The solution, leveraging ConnectX's hardware-based forwarding of IP packets and standard IP-routing protocols, supports 200Gb/s HDR connectivity today, and is future-ready to support higher speeds.



NVIDIA Skyway Highlights

Component	MGA100-HS2
Form Factor	2U rackmount: 19"
Weight	NVIDIA Skyway gateway: 21kg The gateway with ACC and package: 32kg
PCIe Cards	8x NVIDIA® ConnectX®-6 VPI dual-port network interface cards
InfiniBand/Ethernet Ports	8x InfiniBand ports 8x Ethernet ports
Connectivity Speed	InfiniBand: SDR/EDR/HDR100/HDR Ethernet: 25/50/100/200 Gb/s
Bandwidth	Up to 100Gb/s bi-directional per port
Power Supplies	2x AC power supplies

Main System Components

The NVIDIA Skyway system populates eight ConnectX-6 InfiniBand/VPI adapter cards, fans, and two PSUs in the system's rear panel, as shown in the below figure.



Network Interface Cards

NVIDIA Skyway is shipped populated with eight ConnectX-6 dual-port network interface cards (NICs) which enable the hardware-based forwarding of IP packets from the InfiniBand to Ethernet, and vice versa.

Power Supply Units

NVIDIA Skyway is equipped with two redundant, load-sharing power supply units at the rear side of the system. The PSUs are housed in a 2U canister containing the power supplies. Each PSU has an extraction handle, PSU status LED, and a power socket.

For power supply unit LEDs operations, please refer to the [System Monitoring](#) section.

The system enables hot-swapping which enables components to be exchanged while the system is online without affecting operational integrity.



These power supply units can be removed from the system only if they are being replaced.

Fans

Power Supply Fans

NVIDIA Skyway is equipped with one fan per power supply unit on the rear panel of the appliance.

Internal Fans

NVIDIA Skyway is equipped with six internal fans for cooling the CPU and expansion cards. Under normal operation, the cooling fans operate at a constant speed. If the system module fails or one of the temperature thresholds is exceeded, the cooling fans automatically raise their rotation speeds to draw more airflow.

Package Contents

Check the package contents list to see that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping. Please note that the product must be placed on an antistatic surface.

Category	Qty.	Item
Systems	1	NVIDIA Skyway 2U system
Slide Rail Kit	1	1U/2U 36" slide kit pair for NVIDIA Skyway
Power Cables	2	250V 10A 1830MM C14 TO C13 power cable
	2	Cable retainers
Harness	1	Harness RS232 2M cable—DB9 to RJ-45 (do not connect to the COM port)
Documentation	1	Quick Installation Guide

Rail Kit Package Contents

Category	Qty.	Item
Slides	1	2 sets of slides
Screw M5* 15L	2	8 pcs

Management Interfaces, PSUs, and Fans

Processor System	Chipset	Intel 4209T, 2.2GHz, 11M, 8 Cores
	CPU Type	Dual Intel LGA3647 Xeon Scalable processor (up to 140W TDP)
	Memory Type	Supports DDR4 2133/2400/2666 MHz ECC-REG Modules
	Memory Size	4 x 16GB DDR4 2666MHz
	Memory Voltage	1.2V
	Error Detection	<ul style="list-style-type: none">• Corrects single-bit errors• Detects double-bit errors (using ECC memory)
Rear I/O Panel	USB	4x USB 3.0
	RJ-45/LAN	4 x RJ-45 LAN ports: <ul style="list-style-type: none">• 2x 10GbE• 2x 1GbE/IPMI-LAN

On-board Devices	EC	TE 8528E chip provides motherboard, RS-232, and hardware monitor functions
	BMC	Sharing with the LAN 1/4.
Expansion slots	PCI-Express	8x network interface cards
Cooling	Chassis Fan	2x 4-pin 80x38 high-speed fans for CPU 4x 4-pin 80x38 high-speed fans for expansion cards
	PSU Fans	One fan per power supply unit
PC Health Monitoring	Voltage	Monitors for CPU Cores, +3.3 V, +5V, +12V, +5V standby, VBAT
	Temperature	Monitoring for CPU0 & CPU1 (PECI) Monitoring for system (HWM)
	Other Features (Case Open)	Chassis intrusion detection

System Features

For a full list of features, please refer to the system's product brief at www.nvidia.com/en-us/networking. In the main menu, click on PRODUCTS → INFINIBAND → GATEWAY & ROUTERS SYSTEMS → select the desired product page.

InfiniBand-to-Ethernet Gateway Operational Description

NVIDIA Skyway GA100 is an appliance-based InfiniBand-to-Ethernet gateway, enabling Ethernet storage or other Ethernet-based communications to access the InfiniBand datacenter, and vice versa. The solution, leveraging ConnectX's hardware-based forwarding of IP packets and standard IP-routing protocols, supports 200Gb/s HDR connectivity, today, and is future-ready to support higher speeds.

NVIDIA Skyway contains 8 ConnectX VPI dual-port adapter cards which enable the hardware-based forwarding of IP packets from InfiniBand to Ethernet, and vice versa. NVIDIA Skyway also includes the NVIDIA Gateway Operating System, MLNX-GW, which manages the appliance and handles the high availability and load balancing between the ConnectX cards and gateway appliances.

A single NVIDIA Skyway supports a maximum bandwidth of 1.6Tb/s, utilizing 16 ports, each of which reaches 100Gb/s traffic. In terms of connectivity, the InfiniBand ports can be connected to the InfiniBand network using HDR/HDR100 or EDR speeds, while the Ethernet ports can be connected to the Ethernet network using 200Gb/s or 100Gb/s.

Load Balancing and High Availability Operational Description

On the Ethernet side, the load balancing and high availability functions are achieved by leveraging Ethernet LAG (Link Aggregation). LACP (Link Aggregation Control Protocol) is used to establish the LAG and to verify connectivity. On the InfiniBand side, these functions are achieved by assuring that different flows go through different ConnectX HCAs, so that, in case a HCA drops, another HCA will continue passing its flows.

At initialization, 256 gateway GIDs are spread evenly among all InfiniBand ports of the gateway appliances. When an InfiniBand node initiates a traffic flow through the gateway, it first sends a broadcast ARP request with the default gateway IP address to determine the gateway's GID. All ConnectX cards receive the request, but only one sends the ARP response. The response is sent from the ConnectX cards that were assigned to handle the range of GIDs corresponding to the sending node's IP address. When the originating node receives the gateway GID, it sends a path query to the subnet manager (SM) to determine the gateway LID and the communication flow is performed as usual.

The dynamic assignment of the 256 gateway GIDs is the basic element of the load balancing and high availability operations. For any change in gateway configurations (e.g., a cable is dropped, an Ethernet link is disabled, or an appliance is powered off), the gateway GIDs get reassigned by MLNX-GW to be handled by other ConnectX cards. From the end-node perspective, nothing is changed. The same GID and LID remain, even when handled by a different ConnectX HCA.

Operating System

NVIDIA Skyway includes the NVIDIA Gateway operating system, MLNX-GW, which manages the appliance and handles the high availability and load balancing between the ConnectX cards and between gateway appliances. For a detailed description of MLNX-GW, see please see [NVIDIA MLNX-GW User Manual for NVIDIA Skyway](#) or contact your NVIDIA representative.

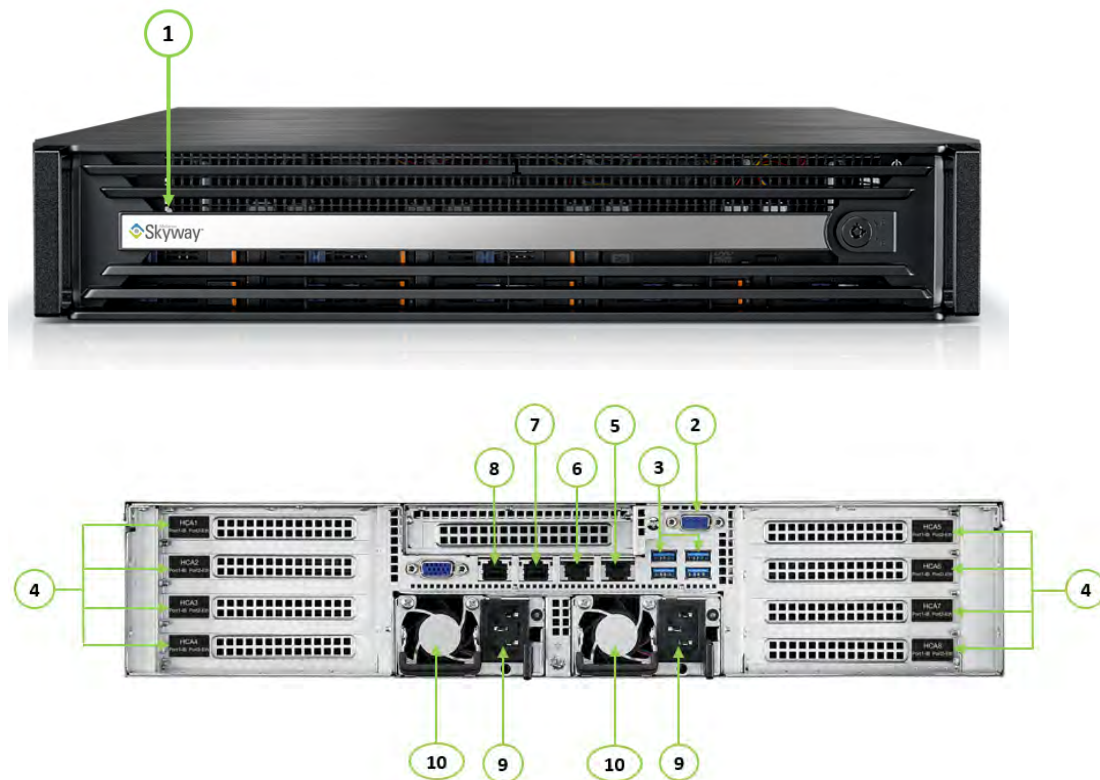
Certifications

The list of certifications per system for different regions of the world (such as EMC, safety, and others) is located on the NVIDIA Networking website at http://www.mellanox.com/page/environmental_compliance.

System Layout and Interfaces

The figures below show the front and rear sides of NVIDIA Skyway. Each numbered interface that is referenced in the figures is described in the following table with a link to detailed information.

NVIDIA Skyway Front and Rear Panel



Item	Interface	Description
1	Power-On LEDs	Bezel LED—lights when the system is powered on
2	COM port	Serial DB9 to RJ45 RS232 port—not active
3	USB Interfaces	4 x USB 3.0 ports at the rear panel
4	PCIe Gen 3.0/4.0 Slots	8x ConnectX-6 VPI adapter cards
5	LAN1	RJ-45 LAN port—10G IPMI-LAN2
6	LAN2	RJ-45 LAN port—10G
7	LAN3	RJ-45 LAN port—1G
8	LAN4	RJ-45 LAN port—1G IPMI-LAN1
9	Redundant Power Module	Two redundant 80 PLUS PLATINUM PSUs at the rear of the appliance
10	Power Supply Fans	One fan per power supply unit

Interfaces Detailed Description

Power-On LED

There is one I/O LED (green) on the front panel, to indicate if the system is powered.

- For Power-On LEDs definitions, please refer to [Power-On LEDs Specifications](#)

USB 3.0 Interfaces

Skyway offers four USB 3.0 ports on the system's rear panel.

The USB interfaces are USB 3.0 compliant and can be used to provide the bandwidth up to 500MB/s to shorten the time for data transmission.

4x USB 3.0



Do not use excessive force when inserting or extracting the USB disk to and from the connector.

PCIe Gen 3.0 Slots

Skyway is shipped assembled with eight ConnectX-6 VPI cards that enable the hardware-based forwarding of IP packets from InfiniBand to Ethernet, and vice versa.

LAN Interfaces

Skyway features two 10G Base-T Ethernet LAN 1/2 connections (Intel X557 PHY (2* 10GbE)) and two GbE LAN 3/4 (Intel I210 (2* 10/100/1000 Base-T GbE)) to eliminate bottlenecks in network data flow. The ports are accessible from the appliance's rear panel.

In addition, the appliance is equipped with ASPEED 2500 BMC chip that supports IPMI 2.0 (Intelligent Platform Management Interface 2.0) via LAN1 and LAN4 ports.

The recommended cabling when connecting LAN4 and LAN1 (for 10G LAN) is Cat. 6 (< 55m) or Cat. 6A (<100m) for which both cross and straight cables are supported.

LAN3 (X557-AT2 controller) has an internal signal connected to BMC LAN2.

- For LAN1 and LAN2 LED definitions, please refer to [LAN1 / LAN 2 Rear I/O LED Specifications](#)

- For LAN3 and LAN4 LEDs definitions, please refer to [LAN3 / LAN4 Rear I/O LED Specifications](#)

Redundant Power Module

NVIDIA Skyway is equipped with two redundant power supply units at the rear of the appliance. The PSUs are housed in a 2U canister containing the power supplies. Each PSU has an extraction handle, PSU status LED, and a power socket.

- 80 PLUS Platinum 1+1 redundant power supply
- 1000 W @ 100 ~ 127 V
- 2000 W @ 200 ~ 240 V

- For the redundant power module LEDs definitions, please refer to [Power Module LED specifications](#)

Fans Modules

Power Supply Fans

NVIDIA Skyway is equipped with one fan per power supply unit on the rear panel of the appliance.



PSU Fans

Internal Fans

NVIDIA Skyway is equipped with six internal fans for cooling the CPU and expansion cards. Under normal operation, the cooling fans operate at a constant speed. If the system module fails, or one of the temperature thresholds are exceeded, the cooling fans automatically raise their rotation speeds to draw more airflow. For example, if there are two fans for CPU cooling and the temperature of CPU0 raises, only these two system fans will raise their fan speed and the other four fans for the cooling of expansion cards will operate at a constant speed. Below is a list of the different internal fan types.

- 2 x 4-pin 80x38 fan for CPU cooling
- 4 x 4-pin 80x38 fan for expansion card cooling
- All fans are equipped with tachometer status monitoring

Hardware Installation

Installation of the NVIDIA Skyway gateway requires attention to the mechanical and power elements of the appliance and precautions must be taken for the rack-mounted equipment.

The system platform can be rack-mounted and is designed for installation in a standard 19" rack. The power side of the system includes two hot-swap power supply units (PSUs), and replaceable fan trays. There is one possible airflow direction. It is necessary to validate that the system airflow direction is compatible with the system, rack, and PSUs. The rear panel of the system has the QSFP28 ports, system LEDs, and management connection ports.

Use a rack capable of supporting the mechanical and environmental characteristics of a fully-populated platform.



The rack mounting holes conform to the EIA-310 standard for 19-inch racks. Take precautions to guarantee proper ventilation in order to maintain good airflow at ambient temperature.

NVIDIA Skyway Installation

The installation procedure of NVIDIA Skyway involves the following steps.

Step	Procedure	Direct Link
1	Follow safety warning procedures.	Refer to Safety Warnings
2	Pay attention to the system considerations within the host chassis.	Refer to System Requirements
3	Follow the safety precautions	Refer to Safety Precautions
4	Unpack the package and confirm all required components are present.	Refer to Unpacking the Package
5	Mount the appliance in a rack enclosure.	Refer to Rack Mounting
6	Use the supplied cables to connect the system	Refer to Cable Installation
7	Power on the system.	Refer to Initial Power-On

Safety Warnings


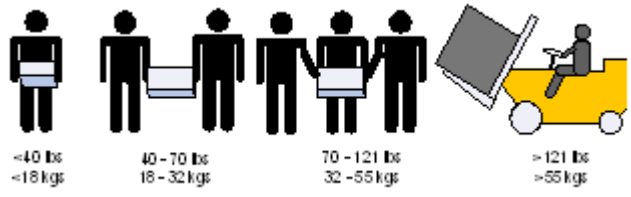
























Safety warnings are provided here in the English language. For safety warnings in other languages, refer to the Safety Instructions for Gateway document available on <https://www.nvidia.com/en-us/networking/>.

Please observe all safety warnings to avoid injury and prevent damage to system components. Note that not all warnings are relevant to all models.



Installation Instructions
Read all installation instructions before connecting the equipment to the power source.

	<p>Bodily Injury Due to Weight Use enough people to lift this product safely.</p>  <p><40 lbs <18 kgs 40 - 70 lbs 18 - 32 kgs 70 - 121 lbs 32 - 55 kgs >121 lbs >55 kgs</p>
	<p>Heavy Equipment This heavy equipment should be moved using a mechanical lift to avoid injuries.</p>
	<p>Risk of Electric Shock!</p> <ul style="list-style-type: none"> With the fan module removed power pins are accessible within the module cavity. Do not insert tools or body parts into the fan module cavity. For AC powered switch systems: Disconnecting one power supply only disconnects one module. To isolate the unit completely, all connected power supplies must be disconnected.  <p>In QM97X0/HGX H100 switch systems: for 200-240Vac use only</p>
	<p>Over-temperature This equipment should not be operated in an area with an ambient temperature exceeding the maximum value listed in the product specifications. Moreover, to guarantee proper ventilation, allow at least 8 cm (3 inches) of clearance around the ventilation openings.</p>
	<p>Stacking the Chassis The chassis should not be stacked on any other equipment. If the chassis falls, it can cause bodily injury and equipment damage.</p>
	<p>Redundant Power Supply Connection (OPTIONAL)—Electrical Hazard This product includes a redundant power or a blank in its place. In case of a blank power supply, do not operate the product with the blank cover removed or not securely fastened.</p>
	<p>Double Pole/Neutral Fusing This system has double pole/neutral fusing. Remove all power cords before opening the cover of this product or touching any internal parts.</p>
	<p>Multiple Power Inlets Risk of electric shock and energy hazard. The PSUs are all independent. Disconnect all power supplies to ensure a powered down state inside of the switch platform.</p>
	<p>During Lightning—Electrical Hazard During periods of lightning activity, do not work on the equipment or connect or disconnect cables.</p>
	<p>Copper Cable Connecting/Disconnecting Copper cables are heavy and not flexible, as such they should be carefully attached to or detached from the connectors. Refer to the cable manufacturer for special warnings/instructions.</p>
	<p>Rack Mounting and Servicing When this product is mounted or serviced in a rack, special precautions must be taken to ensure that the system remains stable. In general, the rack should be filled with equipment starting from the bottom to the top.</p>

	Equipment Installation This equipment should be installed, replaced, and/or serviced only by trained and qualified personnel.
	Equipment Disposal Disposal of this equipment should be in accordance to all national laws and regulations.
	Local and National Electrical Codes This equipment should be installed in compliance with local and national electrical codes.
	Installation Codes This device must be installed according to the latest version of the country national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.
	Battery Replacement Warning: Replace only with UL Recognized battery, certified for maximum abnormal charging current not less than 4mA. There is a risk of explosion should the battery be replaced with a battery of an incorrect type. Dispose of used batteries according to the instructions.
	UL Listed and CSA Certified Power Supply Cord For North American power connection, select a power supply cord that is UL Listed and CSA Certified, 3 - conductor, [16 AWG], terminated with a molded plug rated at 125 V, [13 A], with a minimum length of 1.5m [six feet] but no longer than 4.5m. For European connection, select a power supply cord that is internationally harmonized and marked "<HAR>", 3 - conductor, minimum 1.0 mm ² wire, rated at 300 V, with a PVC insulated jacket. The cord must have a molded plug rated at 250 V, 10 A.
	Installation Codes This device must be installed according to the latest version of the country's national electrical codes. For North America, equipment must be installed in accordance to the applicable requirements in the US National Electrical Code and the Canadian Electrical Code.
	Interconnection of Units Cables for connecting to the unit RS232 and Ethernet Interfaces must be UL certified type DP-1 or DP-2. (Note: when residing in non LPS circuit.)
	Overcurrent Protection A readily accessible Listed branch circuit overcurrent protective device rated 20 A must be incorporated in the building wiring. Acoustic Level Warning The acoustic level listed in Specifications section represents product noise measured in accordance with ISO 7779 under nominal conditions. The actual noise level can vary depending on the installation conditions, including but not limited to the number of racks in the installation, the overall installation size, rack and other equipment material and noise levels, fan faults, room temperature, room configuration, and employee location in relation to the equipment. The data-center owner should manage effective hearing conservation as per the OSHA standard to protect employees against over and extended exposure to noise.
	Do Not Use the Switch as a Shelf or Work Space Caution: Slide/rail mounted equipment is not to be used as a shelf or a work space. The rails are not intended for sliding the unit away from the rack. It is for permanent installation at final resting place only, not used for service and maintenance.
	WEEE Directive According to the WEEE Directive 2002/96/EC, all waste electrical and electronic equipment (EEE) should be collected separately and not disposed of with regular household waste. Dispose of this product and all of its parts in a responsible and environmentally-friendly way.



Country of Norway Power Restrictions

This unit is intended for connection to a TN power system and an IT power system of Norway only.

Taiwan RoHS Declaration - Switch Systems

設備名稱：伺服器						
單元Unit	限用物質及其化學符號					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁶⁺)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷電路板	—	○	○	○	○	○
金屬外殼	○	○	○	○	○	○
塑膠件	○	○	○	○	○	○
PCB 板電子零件	—	○	○	○	○	○
備考1. “超出0.1 wt %”及“超出0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。						
備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。						
備考3. “—”係指該項限用物質為排除項目。						

Taiwan RoHS Declaration - Gateway Systems

設備名稱： 閘道器						
單元Unit	限用物質及其化學符號					
	鉛Lead (Pb)	汞Mercury (Hg)	鎘Cadmium (Cd)	六價鉻 Hexavalent chromium (Cr ⁺⁶)	多溴聯苯 Polybrominated biphenyls (PBB)	多溴二苯醚 Polybrominated diphenyl ethers (PBDE)
印刷電路板	—	○	○	○	○	○
金屬外殼	○	○	○	○	○	○
塑膠件	○	○	○	○	○	○
PCB 板電子零件	—	○	○	○	○	○
備考1. “超出0.1 wt %”及“超出0.01 wt %”係指限用物質之百分比含量超出百分比含量基準值。						
備考2. “○”係指該項限用物質之百分比含量未超出百分比含量基準值。						
備考3. “—”係指該項限用物質為排除項目。						

Taiwan BSMI Class A Statement - Warning to the User!

警告：為避免電磁干擾，本產品不應安裝或使用於住宅環境。

System Requirements

Hardware Requirements



Unless otherwise specified, NVIDIA Networking products are designed to work in an environmentally controlled data center with low levels of gaseous and dust (particulate) contamination.

The operating environment should meet severity level G1 as per ISA 71.04 for gaseous contamination and ISO 14644-1 class 8 for cleanliness level.

Airflow Requirements

NVIDIA Skyway appliance is offered with one airflow pattern: from the front panel to the rear panel.

Refer to the [Technical Specifications](#) section for airflow numbers.

Software Requirements

See [Operating Systems](#) section under the Introduction section.

Unpacking the Package

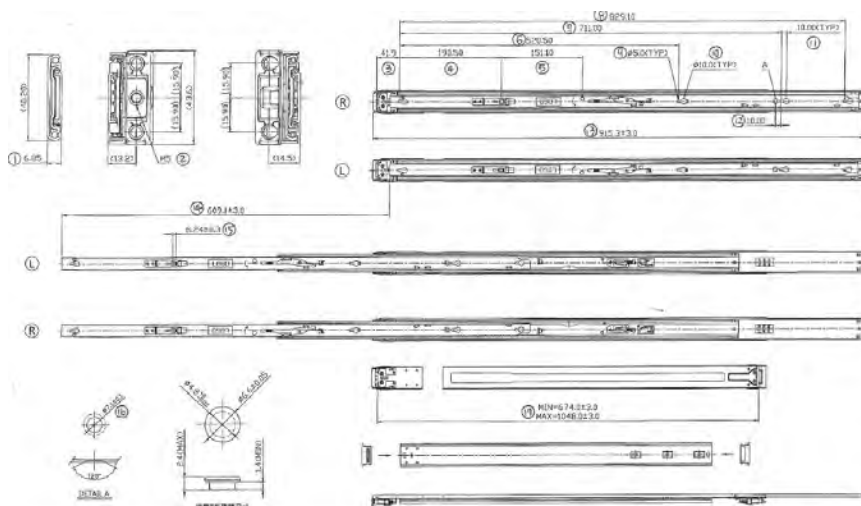
Safety Precautions

The NVIDIA Skyway appliance is installed in systems that operate with voltages that can be lethal. Before opening the case of the system, observe the following precautions to avoid injury and prevent damage to system components.

- Remove any metallic objects from your hands and wrists.
- Make sure to use only insulated tools.
- Verify that the system is powered off and is unplugged.
- Place the ESD mat on the floor where working and put on the ESD strap. Make sure the ESD strap is touching your skin and that the other end is connected to a verified ground.

System Package Contents

Check the package contents list to see that all the parts have been sent. Check the parts for visible damage that may have occurred during shipping. Please note that the product must be placed on an antistatic surface. Please refer to [Package Contents](#).



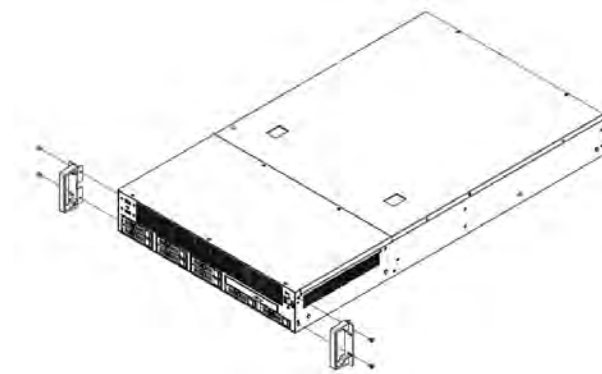
The device comes with a key to the front panel. Note that although the key is provided, there is no reason to open the front panel nor to access the elements behind the front panel.

Rack Mounting

The NVIDIA Skyway appliance can be mounted in a rack using the optional rack mounting kit. We strongly recommend that the minimum depth of cabinet is 1100mm.

Installing the Server in a Rack

Before mounting the NVIDIA Skyway appliance in a rack, ensure that all internal components have been installed and that the unit has been fully tested. Both sides of the chassis ear must be assembled with screws (PN:1930005209) after the slide rail kit has been assembled.



Slide Rail Installation

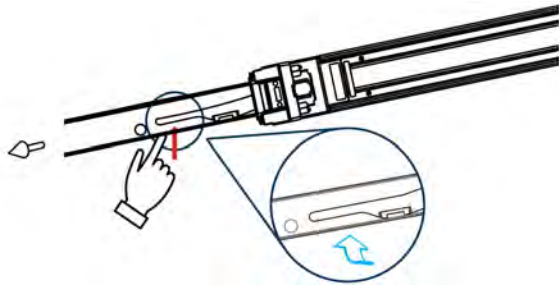


Read prior to installation.

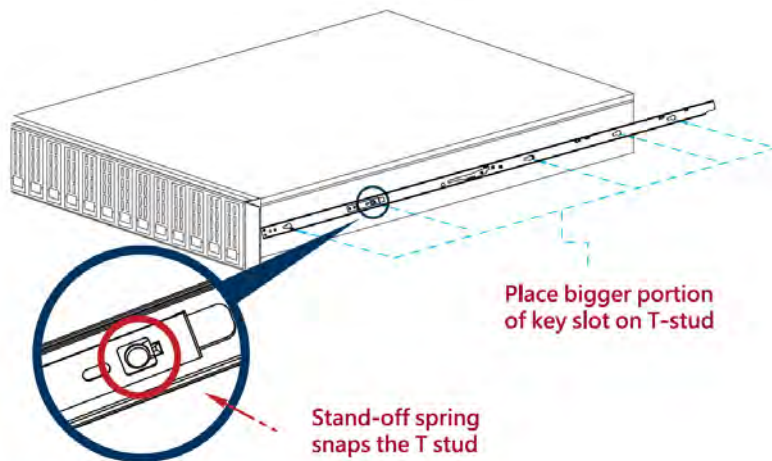
The server slides are developed for 1U or 2U applications of which system load does not exceed 75lbs. The slide length is 1041 ± 3.0 mm. The rear bracket is extendable to a max/min post-to-post distance of 670-1042 mm. The slide extension is 610.0 ± 3.0 mm.



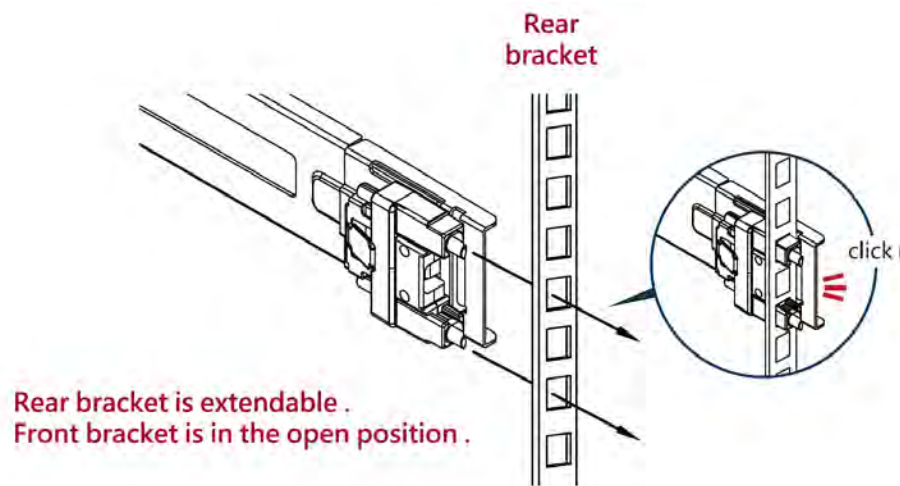
Step 1: Remove inner member. Pull inner member out as in the illustration.



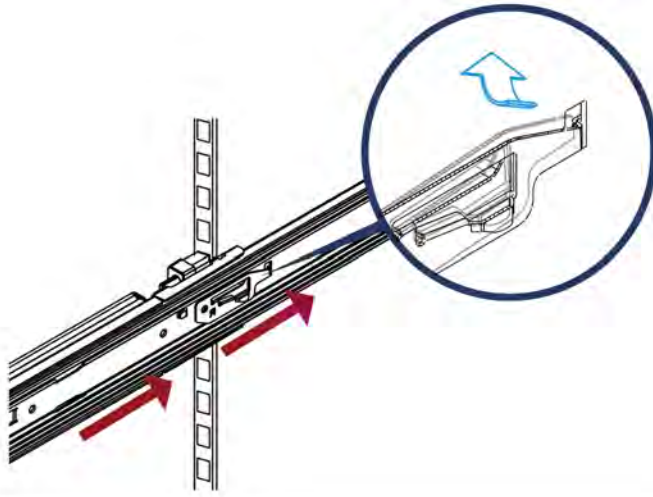
Step 2: Mount the inner member onto the chassis. Place the key slot on T stud, and push the inner member toward the back.



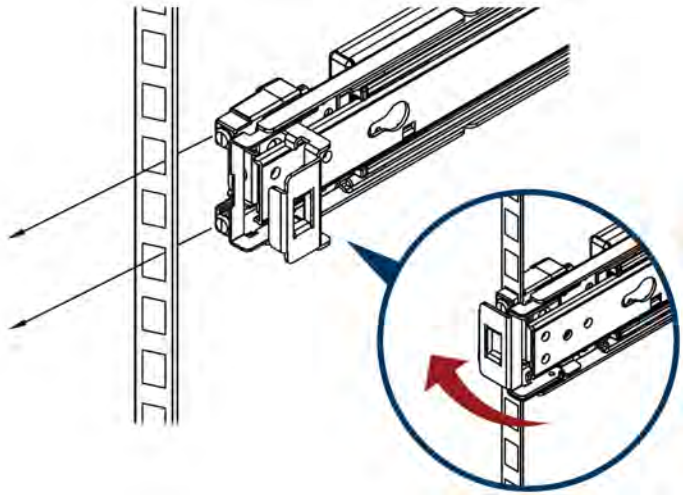
Step 3: Mount the cabinet member to the posts. Align the positioning pin to the desired complete U location, and pull the bracket forwards to lock it to the post. The bracket is locked to the post after a “click” sound is heard.



Step 4: Release the locking latch upward.



Step 5: Push the middle member forward to the rear of the slide.

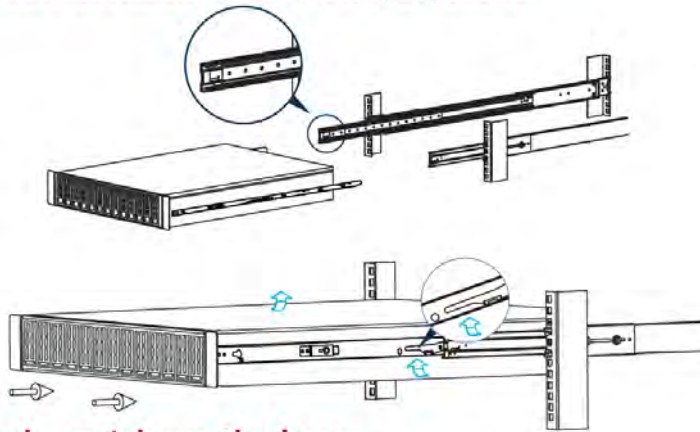


Step 6: Install the chassis.

As shown, insert the inner member to the cabinet member. Make sure the ball retainer is in the open position. If the ball retainer is not on the front position, it might cause damage to the slides. After the inner member goes in, push up/down the disconnect lever to unlock the slides and keep

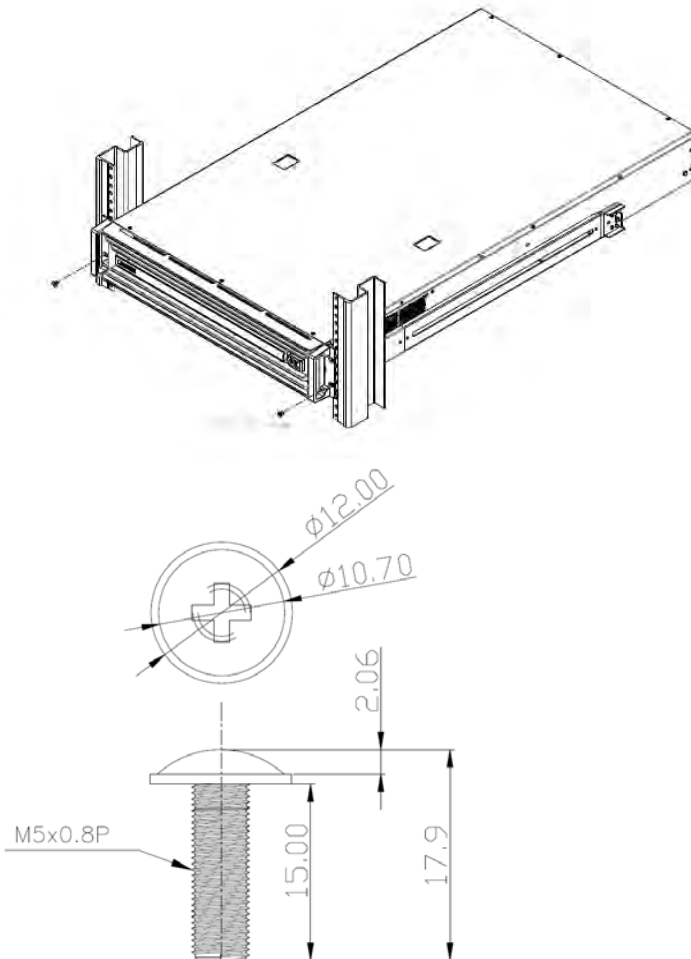
pushing the chassis to the fully-closed position.

Attention: ball retainer must be in the open position.



Push up / down the lever

Step 7: Screw the system in the cabinet.



Rack Mount Instructions (similar rack-mount instructions are included with the installation instructions):

- Elevated Operating Ambient—If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow— Installation of the equipment in a rack should be such that the amount of airflow required for the safe operation of the equipment is not compromised.
- Mechanical Loading—Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading—Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing—Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g., use of power strips).
- Please note that the handlebar and mounting ear must be installed after the slide rail kit has been installed completely.

Cable Installation

Power Cable

The NVIDIA Skyway appliance is shipped with two power supply units. Each supply unit has a separate AC receptacle. The appliance accepts voltages of 100-127 VAC and 200-240 VAC for all possible power supply units. The power cords should be a standard 3-wire AC power cards, including a safety ground, and rated for 15A or higher. The power supplies deliver 2KW AC.



After inserting a power cable and turning the appliance on, confirm the green system LED light is on.



Do not hot swap the power supply if your appliance has only one power supply. Instead, power down the system to replace the power supply unit.

ConnectX-6 Networking Cards Cables

To obtain the list of supported NVIDIA Networking cables for the adapter cards, please refer to the Cables Reference Table at <http://www.mellanox.com/products/interconnect/cables-configurator.php>.

Identifying Ethernet and InfiniBand/VPI Ports



Networking Cable Installation


1. All cables can be inserted or removed with the unit powered on.
2. To insert a cable and press the connector into the port receptacle until the connector is firmly seated.
 - a. Support the weight of the cable before connecting the cable to the adapter card. Do this by using a cable holder or tying the cable to the rack.
 - b. Determine the correct orientation of the connector to the card before inserting the connector. Do not try and insert the connector upside down. This may damage the adapter card.
 - c. Insert the connector into the adapter card. Be careful to insert the connector straight into the cage. Do not apply any torque, up or down, to the connector cage in the adapter card.
 - d. Make sure that the connector locks in place.

⚠ When installing cables make sure that the latches engage.

⚠ Always install and remove cables by pushing or pulling the cable and connector in a straight line with the card.


3. After inserting a cable into a port, the green LED indicator will light when the physical connection is established (that is, when the unit is powered on and a cable is plugged into the port with the other end of the connector plugged into a functioning port). See [Network Interface Cards LEDs](#) under the Interfaces section.
4. After plugging in a cable, lock the connector using the latching mechanism particular to the cable vendor. When data is being transferred, the green LED will blink. See [Network Interface Cards LEDs](#) under the Interfaces section.
5. Care should be taken to not impede the air exhaust flow through the ventilation holes. Use cable lengths that allow for routing horizontally around to the side of the chassis before bending upward or downward in the rack.
6. To remove a cable, disengage the locks and slowly pull the connector away from the port receptacle. The LED indicator will turn off when the cable is unseated.

All cables can be inserted or removed with the unit powered on. To insert a cable, press the connector into the port receptacle until the connector is firmly seated. The LED indicator, corresponding to each data port, will light up when the physical connection is established. When a logical connection is made, the relevant port LED will turn on. To remove a cable, disengage the locks and slowly pull the connector away from the port receptacle. The LED indicator for that port will turn off when the cable is unseated. For full cabling guidelines, ask your NVIDIA Networking representative for a copy of NVIDIA Cable Management Guidelines and FAQs Application Note.

 Do not force the cable into the cage with more than 40 newtons/9.0 pounds/4kg of force. Greater insertion force may cause damage to the cable or to the cage.

Initial Power-On


The system's input voltage is specified in the [Technical Specifications](#) chapter. The power cords should be a standard 3-wire AC power cords including a safety ground and rated for 15A or higher.

 The system platform will automatically power on when AC power is applied. There is no power system. Check all boards, power supplies, and fans for proper insertion before plugging in a power cable.


Step 1. Plug in the first power cable.

Step 2. Plug in the second power cable.

Step 3. Wait for the System Status LED to turn green.

 It may take up to five minutes to turn on the system. If the System Status LED is red after five minutes, unplug the system and call your NVIDIA Networking representative for assistance.

Step 4. Check the System Status LEDs and confirm that all of the LEDs show status lights consistent with normal operation (initially flashing, and then moving to a steady color). For more information, refer to [System Monitoring](#).

 After inserting a power cable and confirming the green System Status LED light is on, make sure that the Fan Status LED is green. If the Fan Status LED is not green, unplug the power connection and check that the fan module is inserted properly and that the mating connector of the fan unit is free of any dirt and/or obstacles. If no obstacles were found and the problem persists, call your NVIDIA Networking representative for assistance.

Configuring the Gateway for the First Time

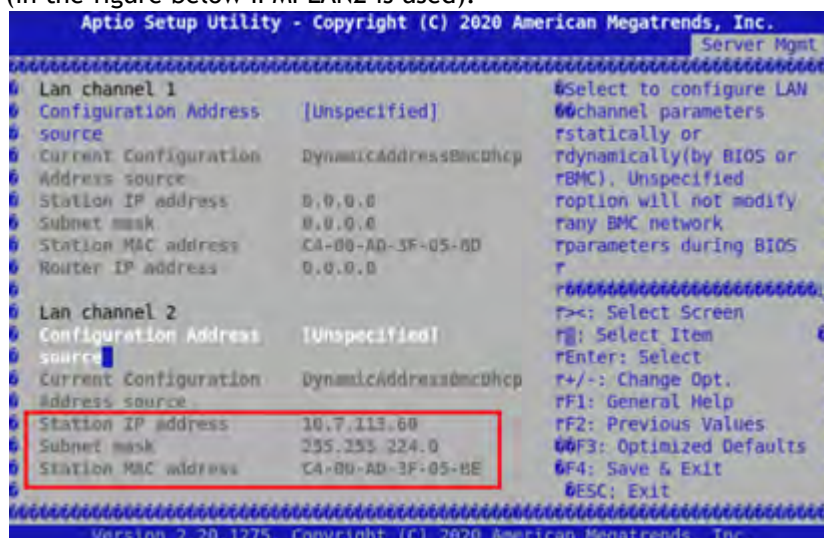
Gateway Initialization

To initialize the gateway, follow the steps below.

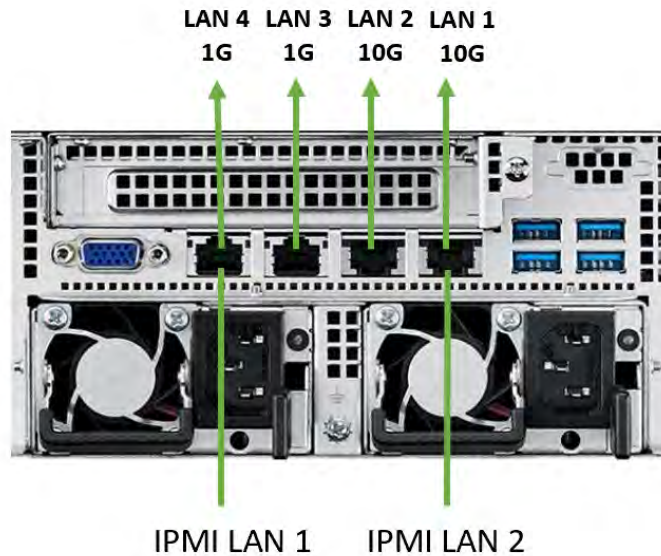
1. Enable remote access to serial console via IPMI.

⚠ Steps a through d, below, instruct how to find the MAC address for the IPMI port from inside the BIOS, even though the outside of the chassis is labeled with the IPMI port MAC address.

- a. Connect a VGA monitor and USB keyboard directly to the NVIDIA Skyway appliance.
- b. To enter the BIOS, reboot the NVIDIA Skyway appliance and press during bootup until the BIOS window pops up.
- c. Go to "Server Mgmt." tab → "BMC network configuration."
- d. The "Station IP address" is the address of the IPMI controller. DHCP may need to be configured in order to provide a lease for the MAC address. The NVIDIA Skyway appliance has 2 LAN ports on the back panel of the appliance that can be used for IPMI (in the figure below IPMI LAN2 is used).



⚠ "Lan channel 1" refers to IPMI LAN 1 and "Lan channel 2" refers to IPMI LAN 2.



- e. Use the following IPMI command to remote access serial console (user and password should be “admin” by default).

```
ipmitool -I lanplus -H <IPMI_CONTROLLER_IP> -U <user> -P <password> sol activate
```

⚠ The command should be run on a Linux console with the “ipmitool” application installed.

Example:

```
ipmitool -I lanplus -H 10.7.113.60 -U admin -P admin sol activate
```

⚠ Make sure to connect to the console SOL port of the gateway and not to the management port. Of the four ports, either of the outer ports (1st or 4th port—either to IPMI LAN1 or IPMI LAN 4, in the image above) can be selected to be the SOL port.

⚠ Once operating system boots, iKVM over HTML5 no longer shows any output. However, iKVM over HTML5 can be used for BIOS configurations at the very beginning of the system boot sequence right before the operating system boots.

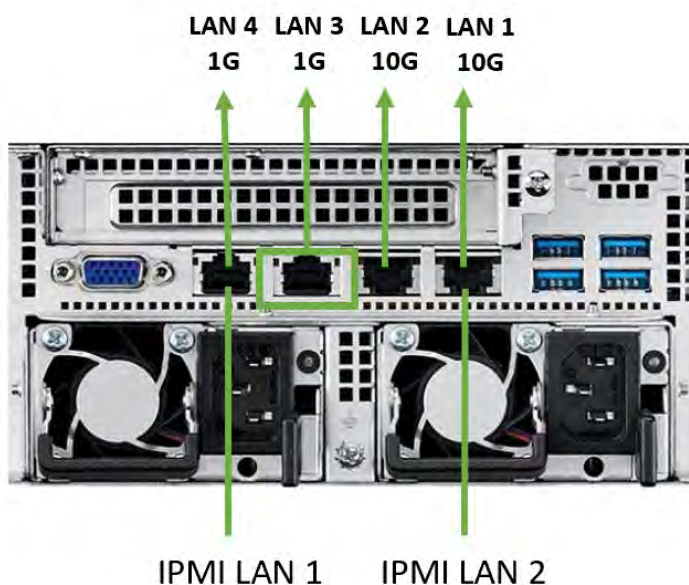
2. Configure Console Redirection. This configuration allows to use remote IPMI to see all serial output that comes after the initial boot, useful for monitoring the OS init flow.
 - a. Go to “Advanced” tab → “Serial Port Console Redirection” → Under “Serial Communication via IPMI COM”.
 - b. Set “Console Redirection” to “Enabled”.

⚠ At this point, make sure to disconnect the VGA monitor and USB keyboard, or else the following error may appear:
TSC_DEADLINE disabled due to Errata; Please update microcode to version : 0xffffffff or later

3. Log in as admin and use admin as password, using IPMI.

```
ipmitool -I lanplus -H <IP Address> -U admin -P admin sol activate
```

4. Connect the management Ethernet cable to LAN3 (second port from the left) on the back panel of the appliance.



5. Go through the Gateway Management configuration wizard.
IP Configuration by DHCP

Wizard Session Display (Example)	Comments
Do you want to use the wizard for initial configuration? yes	This configuration must be performed the first time the gateway is operated or after resetting the gateway to the factory defaults. Type "y" and then press <Enter>.
Step 1: Hostname? [gateway-1]	To accept the default hostname, press <Enter>. Otherwise, type a different hostname and press <Enter>.

Wizard Session Display (Example)	Comments
Step 2: Use DHCP on mgmt0 interface? [yes]	<p>Perform this step to obtain an IP address for the gateway (mgmt0 is the management port of the gateway).</p> <ul style="list-style-type: none"> • Typing “yes” will have the DHCP server assign the IP address • Typing “no” (no DHCP) will offer the use of the “zeroconf” configuration or not. For the use of Zeroconf, type “yes” and the session will continue. If “no” (no Zeroconf) is typed, enter a static IP and the session will continue.
Step 3: Enable IPv6 [yes]	<p>Perform this step to enable IPv6 on management ports.</p> <ul style="list-style-type: none"> • Type “yes” to enable enable IPv6. • Type “no” to not enable IPv6 (Step 4 will be skipped)
Step 4: Enable IPv6 autoconfig (SLAAC) on mgmt0 interface	<p>Perform this step to enable Stateless address autoconfig on external management port.</p> <ul style="list-style-type: none"> • Type “yes” to enable • Type “no” to disable
Step 5: Use DHCPv6 on mgmt0 interface? [yes]	<p>Perform this step to enable DHCPv6 on the MGMT0 interface.</p>
Step 6: Enable password hardening?	<p>Perform this step to enable/disable password hardening on your machine. If enabled, new passwords will be checked upon configured restrictions. If you wish to enable it, type “yes” and press . If you wish to disable it, enter “no”</p>
Step 7: Admin password (Must be typed)? <new_password>	<p>To avoid illegal access to the machine, type a password and press <Enter>. An admin password must be entered upon initial configuration. Due to California Senate Bill No. 327, this stage is required and cannot be skipped.</p>
Step 8: Confirm admin password? <new_password>	<p>Confirm the password by re-entering it. Note that password characters are not printed.</p>
Step 9: Monitor password (Must be typed)? <new_password>	<p>To avoid illegal access to the machine, please type a password and then press <Enter>. An admin password must be entered upon initial configuration. Due to California Senate Bill No. 327, this stage is required and cannot be skipped.</p>
Step 10: Confirm monitor password? <new_password>	<p>Confirm the password by re-entering it. Note that password characters are not printed.</p>

Wizard Session Display (Example)	Comments
<pre> You have entered the following information: Hostname: <gateway name> Use DHCP on mgmt0 interface: yes Enable IPv6: yes Enable IPv6 autoconfig (SLAAC) on mgmt0 interface: yes Enable DHCPv6 on mgmt0 interface: no Enable password hardening: yes Admin password (Enter to leave unchanged): (CHANGED) To change an answer, enter the step number to return to. Otherwise hit <enter> to save changes and exit. Choice: <Enter> Configuration changes saved. To return to the wizard from the CLI, enter the "configuration jump-start" command from configuration mode. Launching CLI... <gateway name> [standalone: master] > </pre>	<p>The wizard displays a summary of choices and then asks to confirm the choices or to re-edit them.</p> <ul style="list-style-type: none"> • Press <Enter>, to save changes and exit • Enter the relevant configuration step number, to edit any of the choices <p>To run the command "configuration jump-start", Config mode must be used.</p>

6. Check the mgmt0 interface configuration before attempting a remote connection (e.g., SSH) to the gateway. Specifically, verify the existence of an IP address.

```

gateway # show interfaces mgmt0

Interface mgmt0 status:
  Comment      :
  Admin up     : yes
  Link up      : yes
  DHCP running : yes
  IP address   : 10.7.148.61
  Netmask      : 255.255.0.0
  IPv6 enabled : yes
  Autoconf enabled: no
  Autoconf route : yes
  Autoconf privacy: no
  DHCPv6 running: no
  IPv6 addresses : 1

  IPv6 address:
    fe80::268a:7ff:fe53:3d8e/64

  Speed      : 1000Mb/s (auto)
  Duplex     : full (auto)
  Interface type : ethernet
  Interface source: physical
  MTU        : 1500
  HW address  : 00:02:c9:11:a1:b2

Rx:
  11700449 bytes
  55753 packets
  0 mcast packets
  0 discards
  0 errors
  0 overruns
  0 frame

Tx:
  5139846 bytes
  28452 packets
  0 discards
  0 errors
  0 overruns
  0 carrier
  0 collisions
  1000 queue len

```

Rerunning the Wizard

To rerun the wizard, do the following:

1. Enter config mode.

```

gateway > enable
gateway # config terminal

```

2. Rerun the wizard.

```
gateway (config) # configuration jump-start
```

Starting the Command Line Interface (CLI)

1. Set up an Ethernet connection between the gateway and a local network machine using a standard SOL connector.
2. Start a remote secured shell (SSH) to the gateway using the command “ssh -l <username> <gateway ip address>”.

```
rem_mach1 > ssh -l <username> <ip address>
```

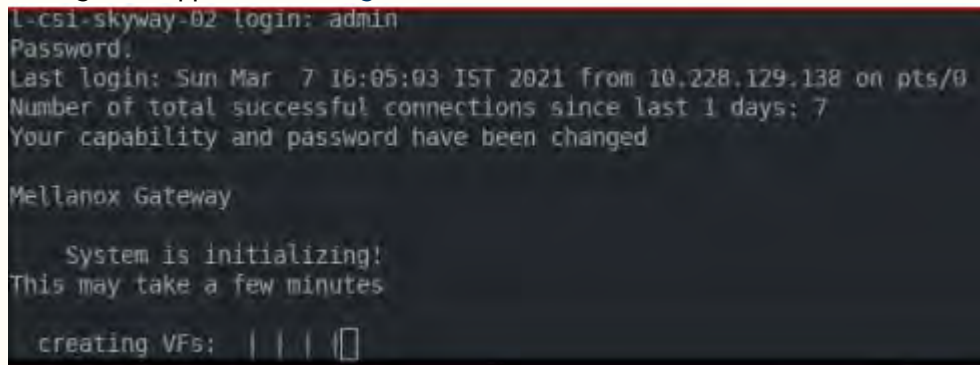
3. Log in to the gateway (default username and password are both "admin").
4. Read and accept the EULA, when prompted.
5. Once the following prompt appears, the system is ready to use.

a.

```
NVIDIA Gateway
Password:
Last login: <time> from <ip-address>
gateway >
```

⚠ If firmware was upgraded, firmware boot bar will appear and the CLI will be blocked until firmware upgrade is complete.

⚠ The CLI will be blocked until InfiniBand virtual interfaces are created. The following message will appear: "Creating VFs".



```
lcsi-skyway-02 login: admin
Password:
Last login: Sun Mar  7 16:05:03 IST 2021 from 10.228.129.138 on pts/0
Number of total successful connections since last 1 days: 7
Your capability and password have been changed

Mellanox Gateway

  System is initializing!
  This may take a few minutes

creating VFs: | | | |
```

Networkwide Deployment Guidelines

Unable to render include or excerpt-include. Could not retrieve page.

Configuring High Availability (HA)

This section explains how to configure a HA cluster with multiple appliances.

Before Configuring HA



- For all appliances in the HA cluster, the MLNX-GW version must be the same.
- For all appliances in the HA cluster, the Ethernet management interfaces must be in the same L2 subnet.
- The Skyway appliances configured in HA mode must be connected to either Ethernet L3-dedicated switch or Ethernet L2 where all ports connected to Skyway are configured as router ports.

- Before configuring HA, each appliance should be configured according to the "Configuring IP Addresses and Routes" section above.
- Virtual IP configuration and Ethernet port channel configuration must be identical for all appliances in the HA cluster.

Example of configuration that needs to be identical for all appliances:

Skyway A:

```
gateway(config) # interface ib port-channel 1 virtual ip address 1.1.1.3/24
gateway(config) # interface ethernet port-channel 1 ip address 2.2.2.2/24
```

Skyway B:

```
gateway(config) # interface ib port-channel 1 virtual ip address 1.1.1.3/24
gateway(config) # interface ethernet port-channel 1 ip address 2.2.2.2/24
```

- The ib port channel IP address may be different between the appliances in the HA cluster:

Skyway A:

```
gateway(config) # interface ib port-channel 1 ip address 1.1.1.1/24
```

Skyway B:

```
gateway(config) # interface ib port-channel 1 ip address 1.1.1.4/24
```

- Make sure that all Ethernet interfaces that are connected to Skyway appliances in the same HA cluster are connected through an Ethernet MLAG or LAG configuration.
Below is an example of MLAG and MAGP configuration on Ethernet switches connected to Skyway appliances.

```

eth_router > enable
eth_router # configure terminal
eth_router (config) # protocol mlag
eth_router (config) # lacp
eth_router (config) # vlan 999
eth_router (config) # interface vlan 999 ip address 192.17.10.3/24 primary
eth_router (config) # interface port-channel 1
eth_router (config) # interface port-channel 1 # exit
eth_router (config) # interface ethernet 1/1-1/4 channel-group 1 mode active
eth_router (config) # interface port-channel 1 ipl 1
eth_router (config) # interface vlan 999 ipl 1 peer-address 192.17.10.2
eth_router (config) # mlag-vip GW-HA ip 10.10.252.10 /16 force
eth_router (config) # no mlag shutdown
eth_router (config) # interface mlag-port-channel 101
eth_router (config) # interface mlag-port-channel 101 # exit
eth_router (config) # interface ethernet 1/19-1/26 mlag-channel-group 101 mode active
eth_router (config) # interface mlag-port-channel 101 no shutdown

eth_router (config) # ip routing
eth_router (config) # vlan 101
eth_router (config) # interface vlan 101 ip address 2.2.2.252/24 primary
eth_router (config) # interface mlag-port-channel 101 switchport access vlan 101
eth_router (config) # protocol mlagp
eth_router (config) # interface vlan 101 mlagp 101
eth_router (config) # interface vlan 101 mlagp 101 # ip virtual-router address 2.2.2.254
eth_router (config) # interface vlan 101 mlagp 101 # ip virtual-router mac-address AA:BB:CC:00:01:01
eth_router (config) # ip route vrf default 172.0.0.0/8 2.2.2.2

```

Below is an example of LAG configuration on Ethernet switch connected to Skyway appliances. Ports 1-8 on the router are connected to the 8 Ethernet ports on the first Skyway appliance and ports 11-18 on the router are connected to the 8 Ethernet ports on the second Skyway appliance.

```

eth_router > enable
eth_router # configure terminal
eth_router (config) # ip routing
eth_router (config) # lacp
eth_router (config) # interface port-channel 1
eth_router (config) # interface port-channel 1 # exit
eth_router (config) # interface ethernet 1/1-1/8 channel-group 1 mode active
eth_router (config) # interface ethernet 1/11-1/18 channel-group 1 mode active
eth_router (config) # vlan 2
eth_router (config) # interface port-channel 1 switchport access vlan 2
eth_router (config) # interface vlan 2 ip address 2.2.2.1 /24
eth_router (config) # ip route 1.1.1.0 /24 2.2.2.2

```



Even if working on a single Skyway appliance system, it is recommended to configure the appliance to have High Availability configuration on the system. This will allow to easily scale the topology in the future without needing to change a single Skyway appliance configuration. See section "Configuring HA on Skyway Appliance" below for configuration details.

Configuring HA on Skyway Appliance

1. Configure HA on the gateway. Configure HA on each Skyway appliance that is going to be a part of the HA cluster.

All Skyway appliances must share the same HA domain.

Skyway A:

```

gateway (config) # gw ha 1
Warning! Configuration is about to be saved and the system will be reloaded.
Type 'YES' to confirm the HA domain id change: YES

```

Skyway B:

```

gateway (config) # gw ha 1

```

Warning! Configuration is about to be saved and the system will be reloaded.
Type 'YES' to confirm the HA domain id change: YES

⚠ After this step, the Skyway appliances will be rebooted.

2. Once all systems complete the initialization, verify that all Skyway appliances were added properly to the HA cluster by running "show gw ha" from one of the Skyway appliances. Verify domain ID appears as configured and all Skyway appliances appear in the output of the command.

```
gateway (config) # show gw ha

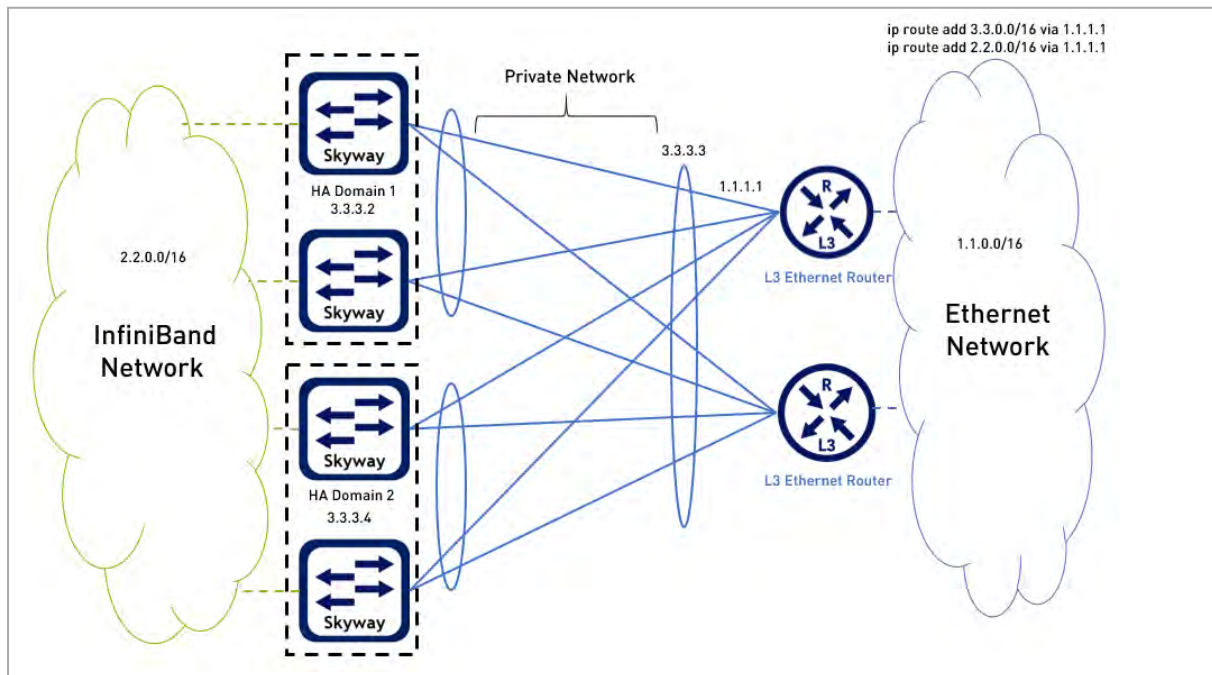
Global HA state:
GW domain ID : 3
Active HA nodes: 3
Master name : skyway-7

HA domain nodes information:
Name : skyway-8
GW Operational state: active
System guid : b8ce:f603:0068:7e8a
Priority : 100

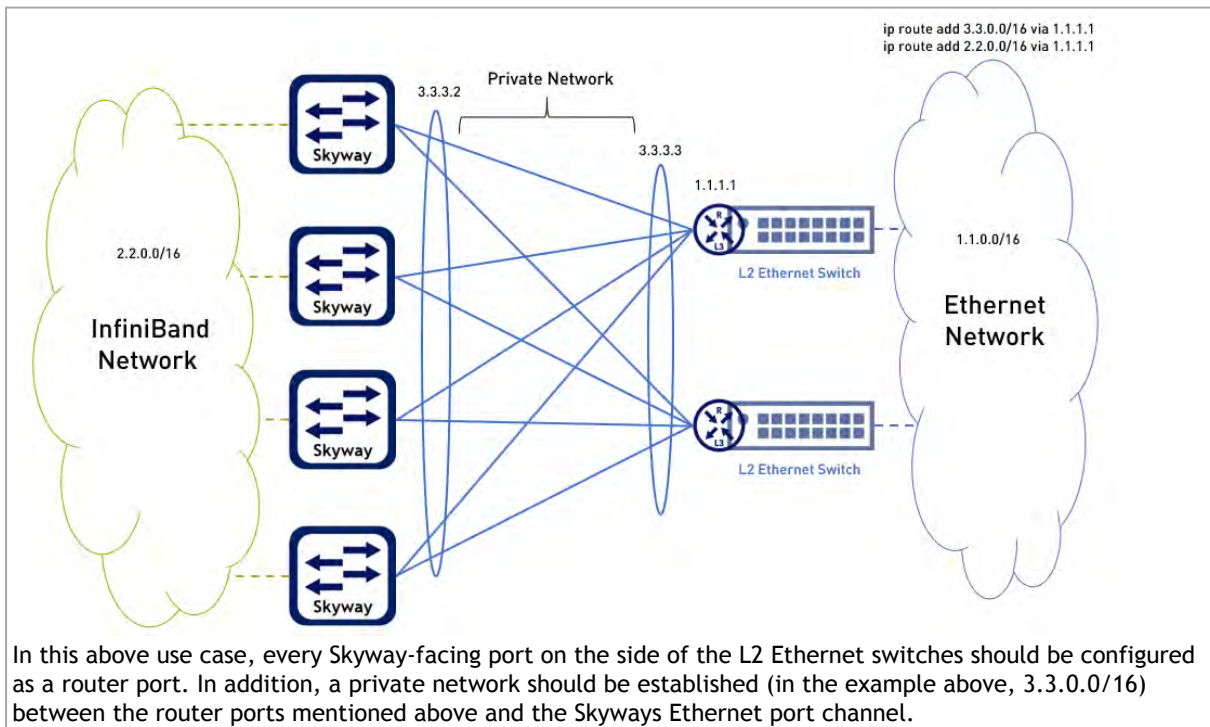
Name : skyway-64
GW Operational state: active
System guid : b8ce:f603:0068:7e8a
Priority : 100

Name : skyway-7 <--- (local node)
GW Operational state: active
System guid : b8ce:f603:0075:6efa
Priority : 100
```

High Availability LAG/MLAG Setup



Skyway Connectivity to the Ethernet Using L2 Ethernet Switches



Configuring Partition Keys (PKEYs)

1. Configure partition keys on the Skyway appliance.

```
#### pkey_id = [1, 7ffe] (hex)
```

2. Configuring partition keys on the subnet manager.

```
ib switch (config) # ib partition <partition name> pkey 0x<pkey_id>
ib switch (config) # ib partition <partition name> ipoib
ib switch (config) # ib partition <partition name> member ALL type full
```

Example:

```
ib switch (config) # ib partition pkey_0x1 pkey 0x1
ib switch (config) # ib partition pkey_0x1 ipoib
ib switch (config) # ib partition pkey_0x1 member ALL type full
```

3. Configure PKEY on the InfiniBand host.

```
#### pkey_full = pkey_id (hex) + 8000 (hex)
echo "0x<pkey_full>" > /sys/class/net/ib<interface_number>/create_child
ifconfig ib<interface_number>.<pkey_full> up
ifconfig ib<interface_number>.<pkey_full> <Ib host pkey port ip> netmask <netmask>
ip route add <eth subnet> via <Gw pkey port virtual ip>
ip route add <gw eth subnet> via <Gw pkey port virtual ip>
```

Example:

```
echo "0x8001" > /sys/class/net/ib1/create_child
ifconfig ib1.8001 up
ifconfig ib1.8001 111.222.62.11 netmask 255.255.255.0
ip route add 2.2.2.0/24 via 111.222.62.1
ip route add 192.168.1.0/24 via 111.222.62.1
```

⚠ Note that this example shows how to configure PKEY that has an ID of 0x1 (0x8001 in hex == 8000+pkeyID). When configuring other PKEYs on the InfiniBand host, make sure to add 8000 to the PKEY ID.

4. Configure the Skyway appliance.

```
gateway (config) # interface ib port-channel 1 pkey 0x<pkey_id>
gateway (config) interface ib port-channel 1 pkey 0x<pkey_id>) # exit
gateway (config) # interface ib port-channel 1 pkey 0x<pkey_id> ip address <Gw pkey port ip> <netmask>
gateway (config) # interface ib port-channel 1 pkey 0x<pkey_id> virtual ip address <Gw pkey port virtual ip> <netmask>
gateway (config) # configuration write
```

Example:

```
gateway (config) # interface ib port-channel 1 pkey 0x1
gateway (config) interface ib port-channel 1 pkey 0x1) # exit
gateway (config) # interface ib port-channel 1 pkey 0x1 ip address 111.222.62.2 255.255.255.0
gateway (config) # interface ib port-channel 1 pkey 0x1 virtual ip address 111.222.62.1 255.255.255.0
gateway (config) # configuration write
```

5. Add routes on the Ethernet host.

```
ip route add <pkey subnet>/<netmask> via <eth router port ip>
```

Example:

```
ip route add 111.222.62.0/24 via <eth router port ip>
```

6. Add routes on the Ethernet router.

```
ip route <pkey subnet>/<netmask> <gw eth pc ip>
```

Example:

```
ip route 111.222.62.0 /24 <gw eth pc>
```

System Monitoring

Front Panel Monitoring Components



Power-On LED

There is one I/O LED (green) on the front panel to indicate if the system is powered.

LED State	Color	Description
On	Green	System is turned on
Blinking	Green	System is under S4 state
Off	N/A	Power off

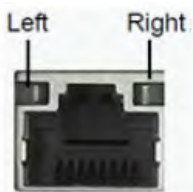
Rear Panel LEDs



LAN Interfaces LEDs

LAN3/LAN4 Rear I/O LED Interface

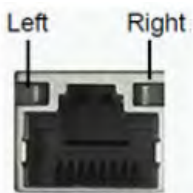
There are two I/O LEDs (green and amber) to indicate LAN link and activity.



Left LED	Right LED	Description
Off	Green	10M bps linked
Off	Blinking Green	10M bps active
Amber	Green	100M bps linked
Amber	Blinking Green	100M bps active
Green	Green	1G bps linked
Green	Blinking Green	1G bps active
Off	Off	No link

LAN1/LAN 2 Rear I/O LED Interface

There are two I/O LEDs (green and amber) to indicate LAN link and activity.



Left LED	Right LED	Description
Amber	Green	1G bps linked
Amber	Blinking Green	1G bps active
Green	Green	10G bps linked
Green	Blinking Green	10G bps active
Off	Off	No link

Power Module LED

There are two I/O LEDs (amber and green) to indicate the power module state.

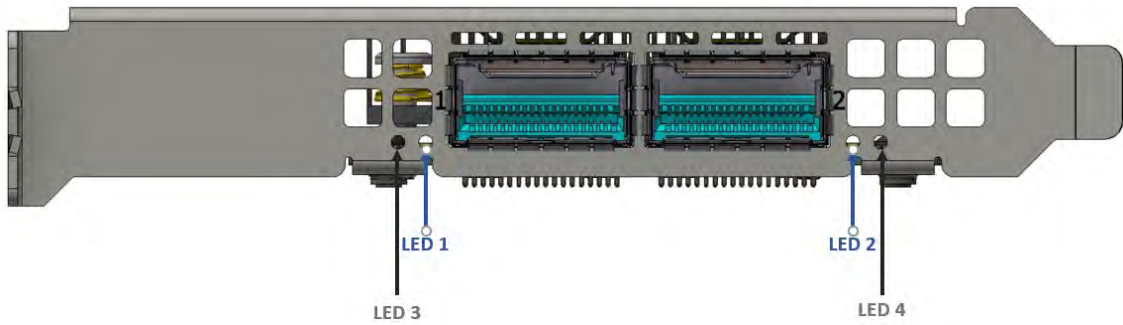
LED State	Color	Description
Blinking	Amber	Power supply warning event
Blinking	Green	AC present standby output on
On	Amber	AC unplug to this module or power supply critical event
On	Green	Power supply DC output ON and OK
Off	Off	No AC power to both power modules

Network Interface Cards LEDs

There are two I/O LEDs per port:

- LED 1 and 2: Bi-color I/O LED which indicates link status. LED behavior is described below for Ethernet and InfiniBand port configurations.

- LED 3 and 4: Reserved for future use.



LED1 and LED2 Link Status Indications (Physical and Logical)—Ethernet Protocol

LED Color and State	Description
Off	A link has not been established.
Blinking amber	1 Hz blinking amber occurs when a beacon command for locating the adapter card running . 4 Hz blinking amber indicates a problem with the physical link.
Solid green	Indicates a valid link with no active traffic.
Blinking green	Indicates a valid logical link with active traffic.

LED1 and LED2 Link Status Indications (Physical and Logical)—InfiniBand Protocol

LED Color and State	Description
Off	A physical link has not been established.
Solid amber	Indicates an active physical link.
Blinking amber	1 Hz blinking amber occurs when a beacon command for locating the adapter card is running. 4 Hz blinking amber indicates a problem with the physical link.
Solid green	Indicates a valid logical (data activity) link with no active traffic.
Blinking green	Indicates a valid logical link with active traffic.

System Maintenance

This chapter contains the installations and un-installation instructions of the following customer replaceable units.

Power Supply Units

Skyway is equipped with two replaceable power supply units (PSU) that work in a redundant configuration. The figure below shows the power side of the system which includes a hot-swap PSU.



Item	Description
1	Power Socket
2	Extraction handle
3	PSU Status LEDs

Extracting and Inserting the Power Supply Unit

⚠ The power supply is only hot-swappable if you have a redundant system with two power supplies installed. If there is only one power supply installed, before removing or replacing the power supply, first take the appliance out of service, turn off all peripheral devices connected to the system, turn off the system by pressing the power button, and unplug the AC power cord from the system or wall outlet.

The PSU can be replaced in case it fails.

➤ To extract the PSU, do the following:

Step 1. If a filler panel is installed, remove the filler panel.

Step 2. If a PSU is installed, grab the handle with your thumb pointing toward the latch. Push the latch with your thumb towards the handle while you pull the PSU out of the appliance.

➤ To insert a PSU, do the following:

Step 1. Make sure the mating connector of the new unit is free of any dirt and/or obstacles.



Do not run the appliance with openings due to missing parts. This may cause overheating due to improper airflow.

Step 2. Insert the PSU by sliding it into the opening, until a slight resistance is felt.

Step 3. Continue pressing the PSU until it seats completely. The latch will snap into place, confirming proper installation.

Step 4. Insert the power cord into the supply connector.

Step 5. Insert the other end of the power cord into an outlet of the correct voltage.

Slide Rail Kit

➤ To disassemble the appliance from the rack, do the following:

Step 1. Shut down the appliance.

Step 2. Unplug and remove all connectors.

Step 3. Unplug all power cords.

Step 4. Remove the ground wire.

Step 5. Unscrew the 2 center bolts from inside the handles.

Step 6. Slide the appliance from the rack.

Step 7. Remove the rail slides from the rack.

➤ To install the slide rail, do the following:

- Please refer to [Slide Rail Installation](#) section.

Troubleshooting

As soon as the appliance is plugged in, make sure that the green power LEDs on the power supply units are on.

General Troubleshooting

Issue	Resolution
System Status LED is RED	Unplug the appliance and call your NVIDIA Networking representative.
Power Supply Unit Status LED is not lit or is RED	<ol style="list-style-type: none">1. Check that the power cable is plugged into a working outlet.2. Check that the power cable has a voltage within the range of 100-240 volts AC.3. Remove and reinstall the power cable.4. Remove and reinstall the PSU.
The Power Button w/Integrated LED for the appliance shuts off	<ol style="list-style-type: none">1. Check that there is adequate ventilation.2. Make sure that there is nothing blocking the front or rear of the chassis and that the fan modules and ventilation holes are not blocked (especially look for dust over the holes).3. If you find dust blocking the ventilation holes, it is recommended to clean the fan unit and remove the dust from the front and rear panels of the appliance using a vacuum cleaner.
The Activity LEDs do not come on	Check if the NVIDIA Skyway appliance has been started.
The appliance is off	<ol style="list-style-type: none">1. Press the Power Button w/Integrated LED If that does not work, do the following: <ol style="list-style-type: none">1. Unplug the appliance.2. Wait 5 minutes.3. Plug in the appliance, and press the Power Button w/Integrated LED.4. If the appliance does not come on, check the power supplies.5. If the appliance comes on, use the NVIDIA Skyway management software to determine the cause of the shutdown.6. Check the temperature.7. Check the fan status.

Technical Specifications

MGA100-HS2 Specifications

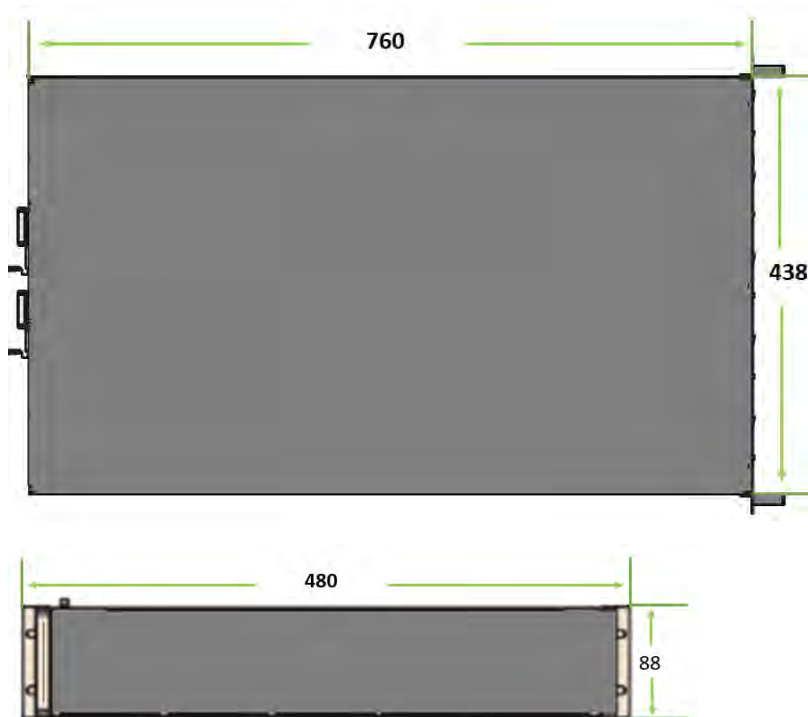
Physical	Dimensions (W x H x D): 438 x 88 x 760 (17.24" x 3.46" x 29.92")	
	Weight: <ul style="list-style-type: none"> NVIDIA Skyway gateway: 21kg NVIDIA Skyway gateway with ACC and package: 32kg 	
	Mounting: 19" rack mount	
Protocol Support	InfiniBand: IBTA v1.3 ^a Auto-Negotiation: SDR (2.5Gb/s per lane), DDR (5Gb/s per lane), EDR (25Gb/s per lane) port, HDR100 (2 lane x 50Gb/s per lane), HDR (50Gb/s per lane) port Ethernet: 200GBASE-CR4, 200GBASE-KR4, 200GBASE-SR4, 100GBASE-CR4, 100GBASE-KR4, 100GBASE-SR4, 50GBASE-R2, 50GBASE-R4, 25GBASE-R	
	Data Rate	InfiniBand
		SDR/EDR/HDR100/HDR
		Ethernet
		25/50/100/200 Gb/s
	Gen3: SERDES @ 8.0GT/s, x16 lanes (2.0 and 1.1 compatible)	
Power	Voltage: Monitors for CPU Cores, +3.3 V, +5 V, +12 V, +5 V Standby, VBAT	
	80 PLUS Platinum 1+1 redundant power supply 1000 W @ 100 ~ 127 V 2000 W @ 200 ~ 240 V	
	Detailed Power Consumption Per Interface	
	Interface	Power Consumption Per Interface
		Total Power Consumption Per Interface
	2x CPU	2x70W
	2x PCH	2x3W
	4x DDR4 16G	4x2W
	1x SSD SATA 2.5 64G	1x2.5W
	6x fans	6x52.8W
	8x ConnectX-6 Network Cards	8x35W
	1x BMC	1x2W
	6x USB 4x RJ45	15W 2W
	Other server components	3W
	Maximum Power Consumption of the entire server	
Environmental	Temperature	Operating
		0 to 35° C
	Humidity	Non-operating
		-20 to 60° C
	Vibration (5 ~ 500 Hz)	Operating relative humidity
		10-85% @ 40° C (non-condensing)
		Non-operating relative humidity
		10-95% @ 40° C (non-condensing)

	Shock	10G (with 11ms duration, half sine wave)
Airflow/Heat Dissipation	Airflow	<ul style="list-style-type: none"> When all 6 fans are working at full speed: 1045 LFM When only 4 fans are working at full speed: 688 LFM

System Dimensions



All dimensions are in millimeters. All the mechanical tolerances are +/- 0.1mm.



Thermal Threshold Definitions

There are two thermal threshold definitions for NVIDIA Skyway which impact the overall system operation state:

1. **Critical**—When the device crosses this temperature, the firmware will automatically shut down the device. This temperature threshold is set from the BIOS (Advanced > IT8528 HW Monitor > CPU ACPI Shutdown Temperature). The temperature threshold can be configured from 50 to 110°C.
2. **Emergency**—The temperature threshold is set by the CPU's internal thermal trip. It is impossible to change the temperature value through a software interface.

Inventory Information

The system's inventory parameters (such as the serial number or part number) can be extracted from labels on the system's bottom side.



Field Replaceable Units

Ordering Number	Part Description
MGA100-PS	Power supply for NVIDIA Skyway Infiniband-to-Ethernet appliance
MGA100-RKIT	Rail kit for NVIDIA Skyway Infiniband-to-Ethernet appliance

Revision History

Date	Description of Changes
Jun. 2023	Added the following sections: <ul style="list-style-type: none">• Configuring High Availability (HA)• Configuring Partition Keys (PKEYs)
Nov. 2022	Updated Hardware Installation
Jun. 2022	Added partition PKeys to the Networkwide Deployment Guidelines
Nov. 2021	Updated supported protocols across the document.
Jun. 2021	Updated LED tables
Feb. 2021	Updated Technical Specifications .
Nov. 2020	Updated Technical Specifications .
Oct. 2020	Updated package contents.
Oct. 2020	Updated package contents.
Aug. 2020	Initial release.

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