ION 7000 Hardware Reference

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Before You Begin

Read the following topics before you install or service a Palo Alto Networks® next-generation firewall or appliance. The following topics apply to all Palo Alto Networks firewalls and appliances except where noted.

- Tamper Proof Statement
- Third-Party Component Support
- Product Safety Warnings

Tamper Proof Statement

To ensure that products purchased from Palo Alto Networks were not tampered with during shipping, verify the following upon receipt of each product:

- The tracking number provided to you electronically when ordering the product matches the tracking number that is physically labeled on the box or crate.
- The integrity of the tamper-proof tape used to seal the box or crate is not compromised.
- The integrity of the warranty label on the firewall or appliance is not compromised.

Third-Party Component Support

Before you consider installing third-party hardware, read the Palo Alto Networks Third-Party Component Support statement.

Product Safety Warnings

To avoid personal injury or death for yourself and others and to avoid damage to your Palo Alto Networks hardware, be sure you understand and prepare for the following warnings before you install or service the hardware. You will also see warning messages throughout the hardware reference where potential hazards exist.

All Palo Alto Networks products with laser-based optical interfaces comply with 21 CFR 1040.10 and 1040.11.

The following safety warnings apply to all Palo Alto Networks firewalls and appliances, unless a specific hardware model is specified.

- When installing or servicing a Palo Alto Networks firewall or appliance hardware component that has exposed circuits, ensure that you wear an electrostatic discharge (ESD) strap. Before handling the component, make sure the metal contact on the wrist strap is touching your skin and that the other end of the strap is connected to earth ground.

  French Translation: Lorsque vous installez ou que vous intervenez sur un composant matériel de pare-feu ou de dispositif Palo Alto Networks qui présente des circuits exposés, veillez à porter un bracelet antistatique. Avant de manipuler le composant, vérifiez que le contact métallique du bracelet antistatique est en contact avec votre peau et que l'autre extrémité du bracelet est raccordée à la terre.

- Use grounded and shielded Ethernet cables (when applicable) to ensure agency compliance with electromagnetic compliance (EMC) regulations.

  French Translation: Des câbles Ethernet blindés reliés à la terre doivent être utilisés pour garantir la conformité de l'organisme aux émissions électromagnétiques (CEM).

- (ION 7000 and ION 9000 only) At least two people are recommended for unpacking, handling, and relocating the heavier firewalls.

- Do not connect a supply voltage that exceeds the input range of the firewall or appliance. For details on the electrical range, refer to electrical specifications in the hardware reference for your firewall or appliance.

  French Translation: Veillez à ce que la tension d'alimentation ne dépasse pas la plage d'entrée du pare-feu ou du dispositif. Pour plus d'informations sur la mesure électrique, consulter la rubrique des caractéristiques électriques dans la documentation de votre matériel de pare-feu ou votre dispositif.

- WAN and LAN ethernet ports are suitable for interconnection to other local device ethernet ports. These ports are not designed for direct connection to Public Switched Telephone Network (PSTN) ports or interfaces. In addition, copper-based WAN ports, LAN ports, and copper-based modular transceivers are not rated to connect to Telecommunications Outside Plant (OSP) cabling.

- (Devices with serviceable batteries only) Do not replace a battery with an incorrect battery type; doing so can cause the replacement battery to explode. Dispose of used batteries according to local regulations.

  French Translation: Ne remplacez pas la batterie par une batterie de type non adapté, cette dernière risquerait d'exploser. Mettez au rebut les batteries usagées conformément aux instructions.

- I/O ports are intended for intra-building connections only and not intended for OSP (Outside Plant) connections or any network connections subject to external voltage surge events.

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	(All Palo Alto Networks appliances with two or more power supplies)
	Caution: Shock hazard
	Disconnect all power cords (AC or DC) from the power inputs to fully de-energize the hardware.
	French Translation: (Tous les appareils Palo Alto Networks avec au moins deux sources d'alimentation) Débranchez tous les cordons d'alimentation (c.a. ou c.c.) des entrées d'alimentation et mettez le matériel hors tension.

ION 7000 Overview

Learn about the Prisma SD-WAN Instant-On Networks (ION) 7000 and then plan your deployment

- ION 7000
- ION 7000 Ports
- ION 7000 Front Panel with LEDs
- ION 7000 Specifications
- ION Device Compliance Statement
- ION 7000 Installation Kit Components
- Power on the ION 7000

ION 7000

Prisma SD-WAN Instant-On Network (ION) 7000, designed for the data center, enables you to create secure SD-WAN fabric across branches and data centers. It is designed to install seamlessly in the data center by peering with adjacent data center devices using traditional, standard-based routing protocols. Deploy the ION 7000 in an off-path model enabling elastic, non-disruptive scale-out and high availability (HA).

The ION 7000:

- Establishes connectivity with the data center network and exchanges routing information.
- Terminates virtual private networks (VPNs) for all Prisma SD-WAN deployed branch sites.
- Maintains path symmetry and ensures the best path for an application.
- Enables application Service Level Agreements (SLAs) and path selection in conjunction with branch with ION 3000 devices.

ION 7000 Ports

The ports on the ION 7000 are used as follows:

Ports	Description
AUX Port	This port is intended for offline access and configuration of an uninstalled system.
USB Port	This port is reserved for future use.
Controller Ports	This port is used by the ION device to communicate with the Prisma SD-WAN controller.
Internet/Peering Ports	These ports on the ION 7000 are used as internet ports or peering ports.
SFP Ports	These ports are used for 10 gigabit connectivity in copper or fiber form factors.
Fail-to-Wire Ports	2 pairs - ports 5-6 and 7-8.

ION 7000 Front Panel with LEDs

The ION 7000 LEDs indicate the following status:

Icons	Description
Displays power status.	Blue light—Powered on. No light—Powered off.
Displays controller connectivity status.	Blue light—Connected. No light—Not Connected.

ION 7000 Specifications

The following are the device specifications of ION 7000:

Specification	Description
Place in Network	Large, remote office data center.
I/O	
Controller Ports	2 x 10/100/1000 RJ-45
WAN/LAN/Internet Ports	6 x 10 GE SFP+8 x 10/100/1000 RJ-45, port pairs 5/6 and 7/8 have programmable inline fail-to-wire capability for use in branch device mode.
Power and Mechanical	
Type/Watts	1 + 1 redundant PSU 650W
Power Input	AC 100~240 V @50~60 Hz
Fan Cooling	4 x swappable cooling fans, direction of air-flow is from front to rear.
Certifications	
Certifications	CE (EMC), FCC Class A, RoHS, BIS, CCC, KCC
Environmental	
Operating temperature	32°F to 104°F (0°C to 40°C)
Storage temperature	-4°F to 158°F (-20°C to 70°C)
Operating humidity	5% to 95% (non-condensing)
Storage humidity	5% to 95% (non-condensing)
Physical	
Weight	28.6 lbs (13 kg)
Dimensions	21.45" x 17.16" x 1.72" (550 mm x 440 mm x 44 mm)
1U standard 4-post rack space	Recommended
Physical Network Connectivity	A single gigabit copper ethernet port with DHCP and two or more gigabit or ten gigabit ports for other features.

Specification	Description
BGP Peers	Layer 2 connectivity to two separate network devices that are currently participating in any dynamic routing protocol (BGP, OSPF, EIGRP) with each other.
Internet connectivity	This connectivity is used to reach the Prisma SD-WAN controller. It can be in the form of a private connection using a MPLS network through a corporate data center. It can also be a public internet connection provided by a local broadband connection.

ION Device Compliance Statement

The following compliance statements apply to this ION device:

- **VCCI**—This section provides the compliance statement for the Voluntary Control Council for Interference by Information Technology Equipment (VCCI), which governs radio frequency emissions in Japan.

  The following information is in accordance to VCCI Class A requirements:

  この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。　　　　　　VCCI-A

  Translation: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take corrective actions.

- **UL**—Product Ambient Temperature: 0~40 degree C

  ⊖ *Risk of explosion if battery is replaced by an incorrect type. Dispose of used battery according to local regulations.*

- **CE (European Union (EU) Electromagnetic Compatibility Directive)**

  This device is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (2014/30/EU).

  The above product conforms with Low Voltage Directive 2014/35/EU and complies with the requirements relating to electrical equipment designed for use within certain voltage limits.

- **Federal Communications Commission (FCC) statement for a Class A digital device or peripheral**—This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment to an outlet on a circuit that is different from the one to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

- **ICES (Canadian EMC Compliance Statement)**—This Class A digital apparatus complies with Canadian ICES-003.

  French translation: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

- **Korean Communications Commission (KCC) Class A Statement**—This equipment is an electromagnetic compatible device for business purposes (Class A). The provider or user should be aware that the equipment is intended for use outside the home.

ION 7000 Installation Kit Components

The ION 7000 installation kit contains the following parts and tools to install the device:

- 2x 19-inch 1U rack mount sliding rails built-in with quick-attach square hole adapters.
- 4x Rail slides with accompanying screws.
- 2x 19-inch slide lock ears with accompanying screws.
- 2x Red Cat6 crossover/rollover ethernet cable.
- 1x Grey Cat6 straight through ethernet cable.
- 2x Power cord - varies depending on the country or region.
- 1x Screwdriver.
- 1x USB to Cat5/RJ-45 serial cable.

Power on the ION 7000

Connect the power cables to the ION device and plug the device power cable into an AC power outlet. When you switch on the power, the device is powered on and the power indicator turns green.

Shut Down the ION 7000

Shut down the ION 7000 in the following ways:

- Shut down using the Device Toolkit commands

  Run the device toolkit command `debug shutdown` to shut down the device.

  > *Ensure the device is physically accessible to turn it back on, before executing the command.*

- Shut down using the Power Switch

  Press the power switch 5 times (press and hold for 1 second, then, release) to shut down the device.

Reboot the ION 7000

Press the power switch 3 or 4 times to reboot the ION 7000.

Install the ION 7000

Choose to deploy the Prisma SD-WAN ION 7000 in a virtual in-path or HA environment.

- Rack Mount the ION 7000
- Install the Slide Rail into the Rack
- Rack Mount the Slide Rails
- Install the ION 7000 in Virtual In-Path Configuration
- Install the ION 7000 in High Availability

Rack Mount the ION 7000

Mount the ION 7000 on a standard 19-inch rack using the following accessories:

- **19-inch slide lock ears**

    The ION 7000 accessory kit contains slide lock ears for the front sides of the ION 7000. Use these ears to prevent the ION 7000 from detaching from the rack after they are fully installed.

   The following figure illustrates the ION 7000 19-inch slide lock ears.

- **Rail slide to chassis mounting brackets**

    The ION 7000 uses the chassis mounting brackets to attach to the slide rails for mounting in the rack.

    📋 *Use all the four brackets to ensure a secure fit due to narrow tolerances in racks.*

    The following figure illustrates the ION 7000 chassis mounting brackets:
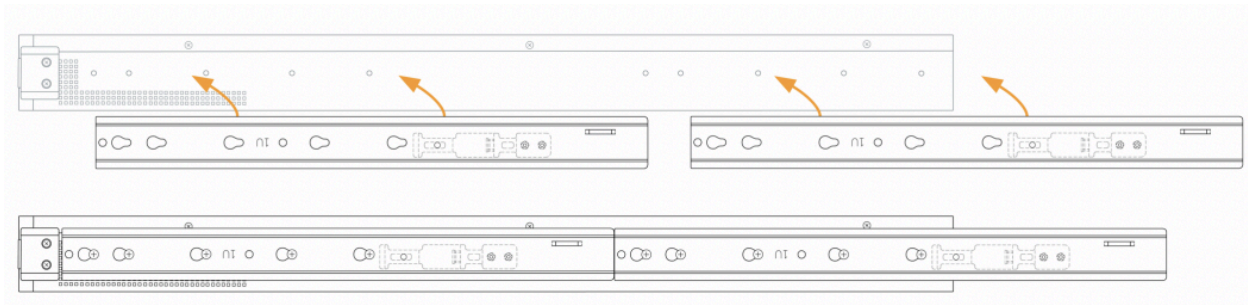
Install the Slide Rail into the Rack

Install the slide rail into a standard 19 inch rack as described below:

STEP 1 | Select a 1-U slot to insert the slide rail into a standard 19-inch rack.

STEP 2 | Snap the three (3) square pegs of the rail into the front and back mounting plate of the rack.

STEP 3 | Ensure that you fully engage the spring retention clip so that the rail is securely attached to the mounting plate.

If the rack has square holes:

1. Insert the slide rails into a standard 19-inch rack making sure that the rails snap into place.
2. Attach the chassis-mounting brackets to either side of the ION 7000.
3. Slide the ION 7000 into the rack and confirm that the device is installed securely in the rack.

If the rack has threaded round holes:

1. Unscrew and detach the square rail snap ends from both ends of each rail.
2. Using screws that fit the threads of the rack (not included), attach each end of the rail to the rack.
3. Attach the chassis-mounting brackets to either side of the ION 7000.
4. Slide the ION 7000 into the rack and confirm that the device is installed securely in the rack.

If the rack has unthreaded round holes:

1. Insert the rail as sent behind the hole plate.
2. Using screws that fit the threads of the rail (not included), screw through the hole in the plate to the screw holes on the end of the rack (from the front).
3. Attach the chassis-mounting brackets to either side of the ION 7000.
4. Slide the ION 7000 into the rack and confirm that the device is installed securely in the rack.
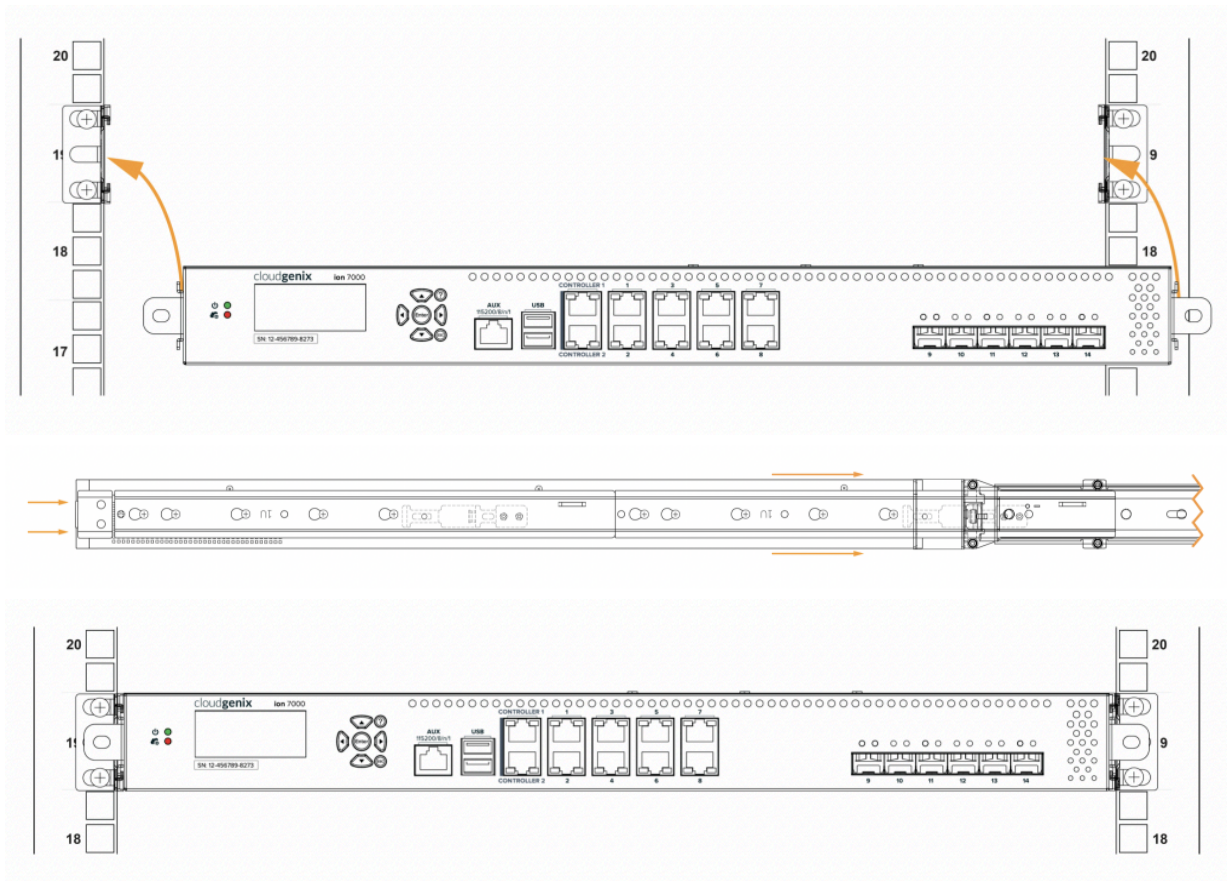
Rack Mount the Slide Rails

Fasten the 19 inch 1U rails securely to the front and back of the rack mount enclosure.

STEP 1 | Orient the front bracket of both rails in the same direction.

STEP 2 | Mount the rails securely and then insert the ION 7000 into the front of the sliding rails.

The following figure illustrate the ION 7000 rack mounting the sliding rails:
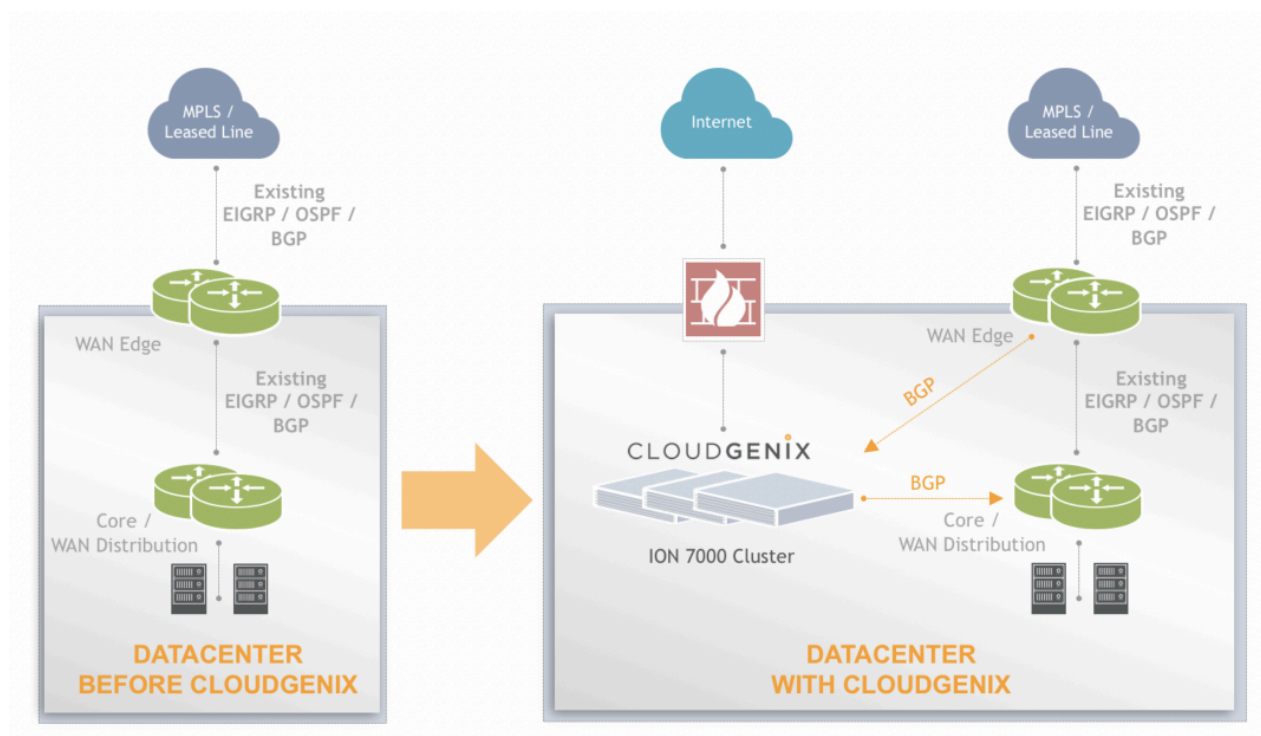
Install the ION 7000 in Virtual In-Path Configuration

The ION 7000 uses a virtual in-path concept to allow the system to perform SD-WAN operations on as it enters and exits the data center. This mode of operation allows the ION 7000 cluster to:

- Solicit very specific traffic for specific endpoints using traditional network routing protocols.
- Require little or no changes in the existing data center network topology.
- Horizontally scale based on load and site number and geographic distribution.
- In event of failure, seamlessly transition traffic to another ION 7000 or the legacy routing network.

The following figure illustrates the virtual in-path deployment architecture of an ION 7000 data center.

To set up the ION 7000 virtual in-path deployment, configure the system with the following port types:

- Setup the ION 7000 Controller Port
- ION 7000 Peering Ports
- ION 7000 Internet Ports

If the ION 7000 is DHCP-enabled, no additional configuration is required. If the device is not DHCP-enabled, you need to configure the device using the static IP address.

Setup the ION 7000 Controller Port

The ION 7000 uses the controller port to communicate with the controller and monitor the network. By default, DHCP is factory-configured on this port. The controller 1 port should be

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connected to a copper 1G ethernet port. This port should have access to the outbound internet access to the Prisma SD-WAN controller service on port 443 (HTTPS).

After this port is connected and the ION 7000 powered on, the ION 7000 automatically connects and registers with the controller. After registration, the ION 7000 is available to claim and configure in the Prisma SD-WAN console.

ION 7000 Peering Ports

The Prisma SD-WAN ION 7000 uses the peering ports to communicate with WAN edge or core or WAN distribution routers using BGP. The routers may be connected using one physical port per router, or multiple routers can share a single port by using a shared Layer 2 VLAN.

The below figure shows the peering port topologies of an ION 7000.
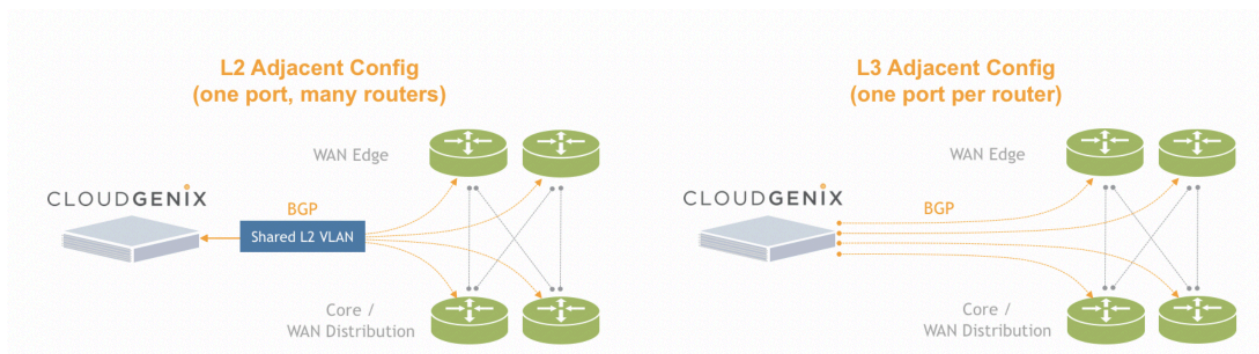
Depending on the number, type and choice of routers and Layer 2 or Layer 3 configurations, the number of peering ports you require may vary. However, any non-controller port may be used for a peering port. These ports are setup and identified at configuration time.

To pre-cable the peering ports before configuration:

STEP 1 | Plan the number and the type of ION 7000 ports needed for peering configuration.

STEP 2 | Physically plug in the ports from the ION 7000 devices to the appropriate routers or switches.

STEP 3 | Record the ION port numbers and connecting router or switch port information for future reference.

ION 7000 Internet Ports

The Prisma SD-WAN ION 7000 uses the internet ports to receive inbound VPN connections from the internet. Typically, ION 7000 devices use one internet port per data center, and this port must be able to receive traffic from the internet.

This internet port must allow inbound UDP 4500 to the ION 7000 from remote ION devices. If a firewall or NAT is used outside the ION 7000 on this port, UDP 4500 needs to be port-forwarded or passed-through from the firewall or NAT device.

To pre-cable the internet ports before configuration:

STEP 1 | Plan the number and the type of ION 7000 ports you need for VPN configuration.

STEP 2 | Physically plug in the ports from the ION 7000 devices to the appropriate devices.

STEP 3 | Record the ION port numbers and connecting device port information for future reference.

Install the ION 7000 in High Availability

The Prisma SD-WAN ION 7000 provides a horizontally-scalable, high availability (HA) solution between branch sites and data center clusters.

STEP 1 | Add a second ION 7000 to the data center that requires high availability (HA).

STEP 2 | Mimic the existing ION 7000 cabling for the second ION 7000 device.

STEP 3 | On the Prisma SD-WAN console, claim the ION device and assign it to a data center and configure the ION device. Verify that it can talk to the core and WAN edge routers.
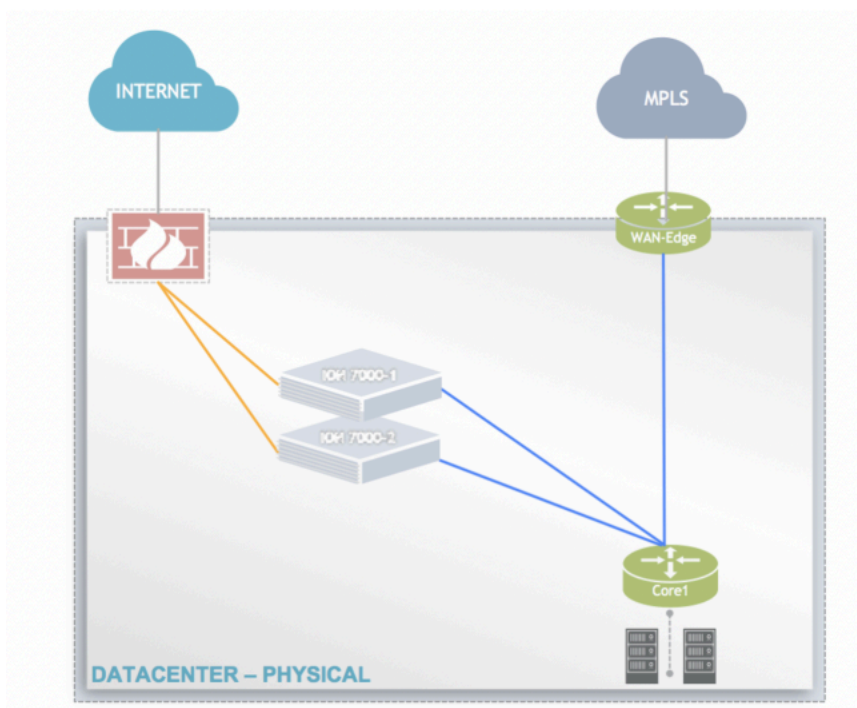
Ensure the following:

- The IP address for the controller port is unique for each ION device. The controller port can be a part of the same subnet as the first ION device.
- The IP addresses for the core and WAN edge peering ports are unique for each ION device and their peering addresses are allocated a /29 or larger subnet block.
- The IP addresses for the internet ports are unique for each ION device.
- Finally, if NAT is configured, ensure that the NAT IP address or the NAT port is unique for each ION device.

> *There is no additional configuration required on the second ION device, except for IP addresses. Both the ION 7000 devices peer with the same core and WAN edge routers. The second ION device inherits the same BGP configuration as the first device.*

Sample physical and logical connectivity using two ION 7000 devices is illustrated below. Although the topology shows only a single core router and WAN edge router, you may use the same connectivity model in environments where there is more than one router.
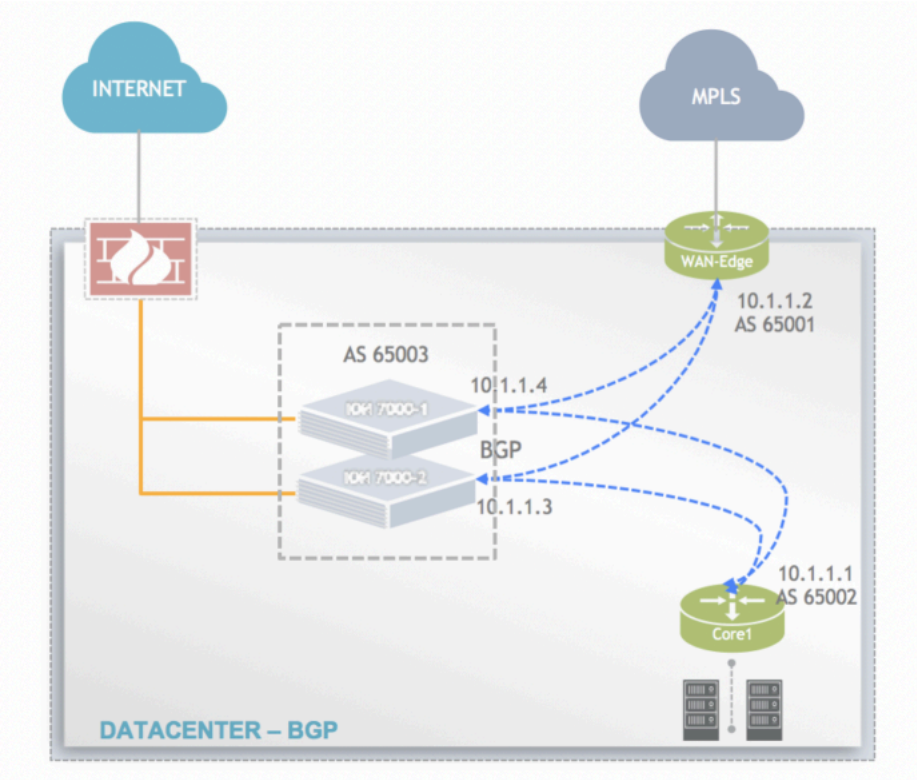
The following image illustrates the physical connectivity for ION 7000 HA.

The following image illustrates the logical connectivity and IP addressing for ION 7000 HA.
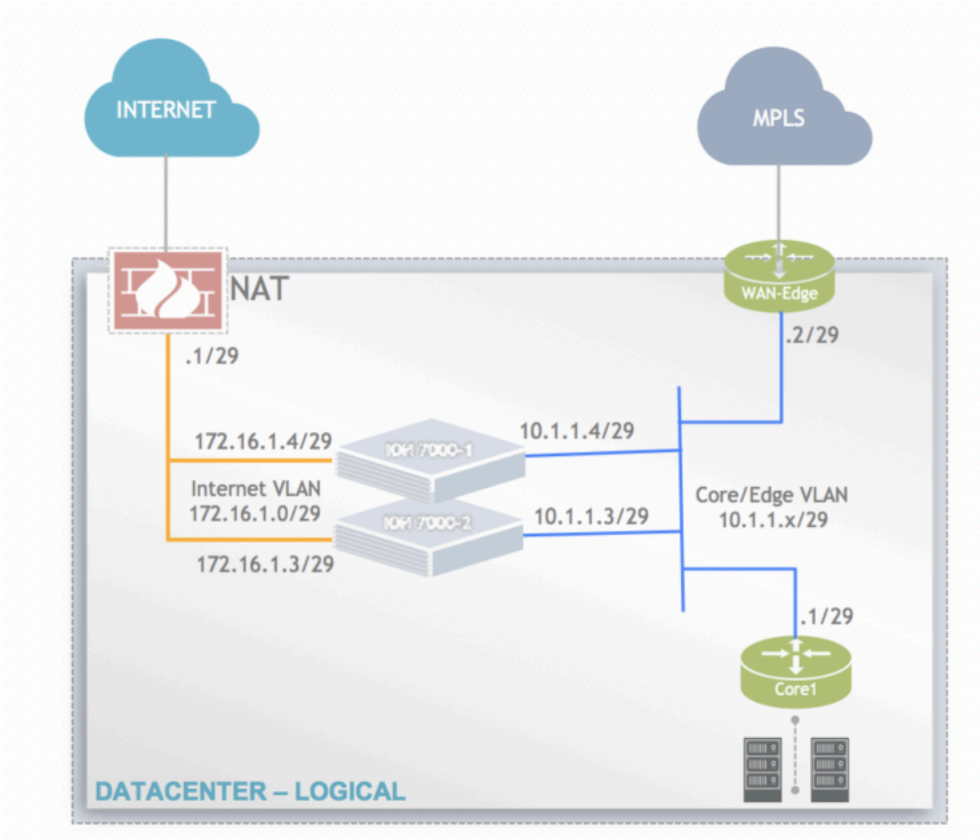
The following image illustrates the setting up BGP for ION 7000 HA.

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For more information, refer the following HA options:

- Branch HA with Internet, MPLS, and Layer 3 LAN Switch
- Branch HA with Internet, MPLS, and a Layer 2 LAN Switch
- Branch HA with Dual Internet and a Layer 3 LAN Switch
- Branch HA with Dual Internet and a Layer 2 LAN Switch