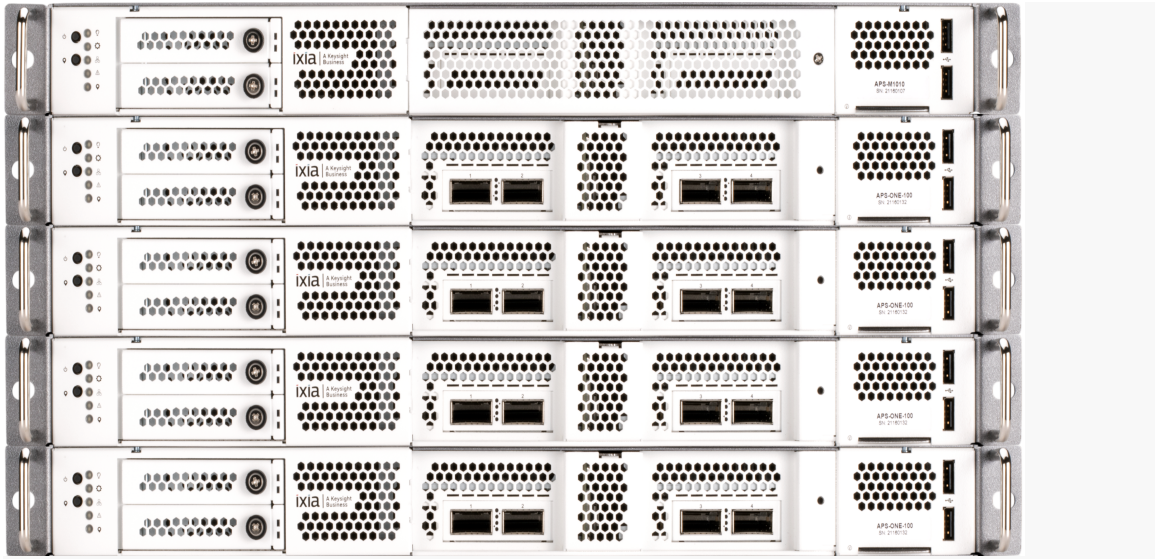# APS-M1010/APS-ONE-100 Platform for IxLoad

Release 9.45

Installation Guide

KEYSIGHT

Notices

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Do not proceed beyond a hazard notice until the indicated conditions are fully understood and met.

> A **CAUTION** notice denotes a hazardous situation that, if not avoided, could result in minor or moderate injury.

A **WARNING** notice denotes a hazardous situation that, if not avoided, could result in death or serious injury.

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Table of Contents

CHAPTER 1
Product overview

Welcome to the Keysight APS-M1010/APS-ONE-100 Platform documentation for IxLoad.

The APS-M1010/APS-ONE-100 Platform provides next-generation ultra-high-performance Layer 4 - Layer 7 application and security testing, TLS support and 100G Interfaces. Industry-proven IxLoad is the user interface application.

The platform consists of one management node (MN) or controller, that can manage up to ten compute nodes (CN) and the Keysight Cluster Operating System (KCOS).

NOTE	Both components of the APS-M1010/APS-ONE-100 Platform are required. Standalone APS-ONE-100 functionality is NOT supported for IxLoad

- The management node is used to manage the entire cluster of compute nodes and expose administrative and test configuration functionalities to the user.

- The compute nodes are used for generating custom traffic. They have QSFP28 interfaces for connecting devices under test (DUTs). Compute nodes must have a functional management node to operate.

- Keysight Cluster Operating System (KCOS) is the base operating system. It provides a command line interface (CLI) and a command shell to enable user control of the various services. It is a purpose-built platform that provides essential services, including host management, user access control, software upgrades and cluster orchestration.

CHAPTER 2
Functionality overview

This chapter provides a functional overview of the APS-M1010/APS-ONE-100 Platform for IxLoad. The entire system runs on the Keysight Cluster Operating System (KCOS). To perform any system-level operation, you will need to use KCOS CLI commands (see the *APS-100/400GE Series Plaform, KCOS Command Line Interface (CLI), For IxLoad Release 9.45, CLI Reference Guide*).

The following diagram provides a high-level system overview.
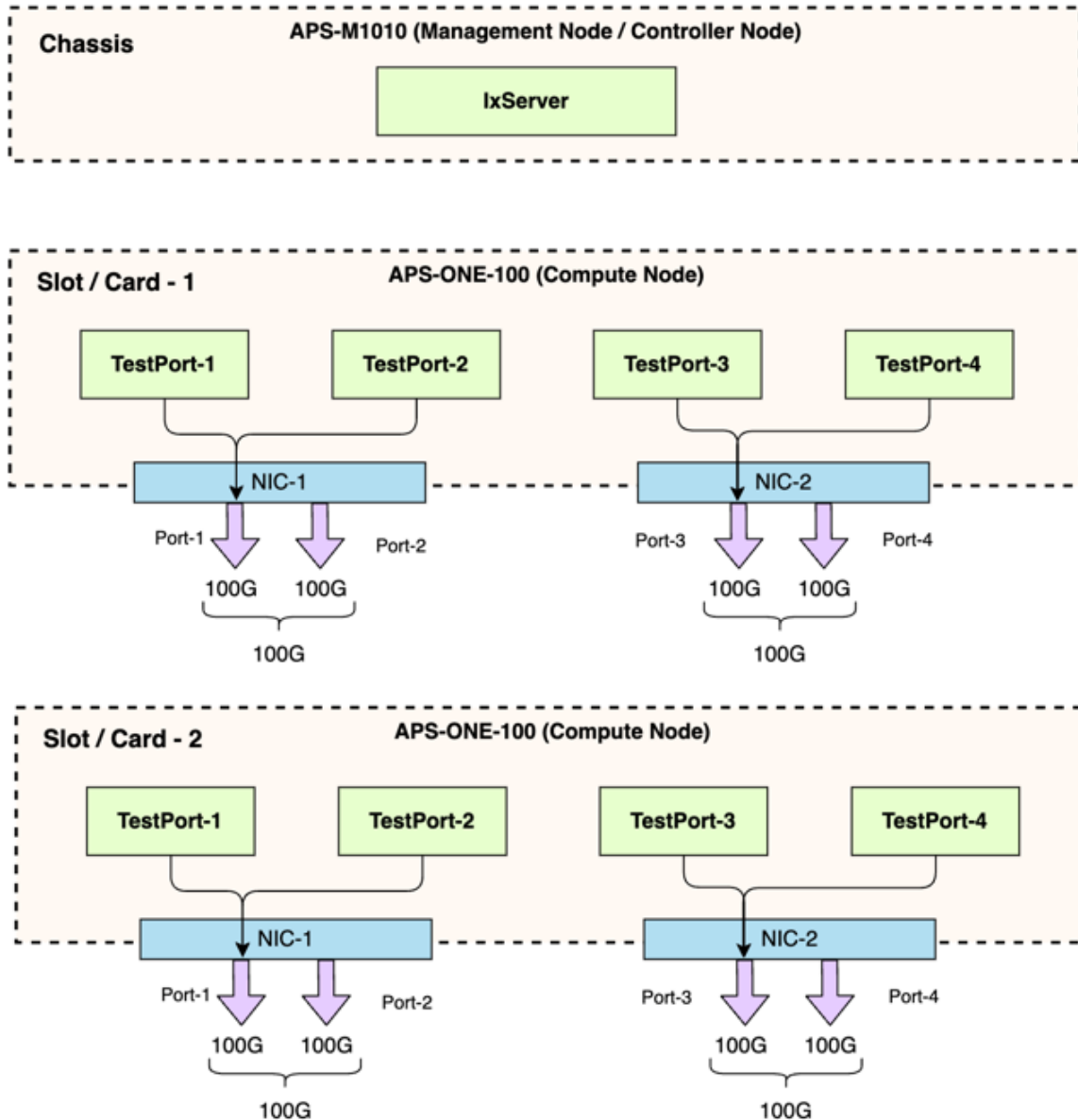
Management Node: The first block in the diagram represents the APS-M1010 Management Node (MN). The MN is used to manage all of the compute nodes and provide administrative and test configuration options to the user.

Compute Nodes: The second and third blocks in the diagram represent Compute Nodes. The Compute Nodes are used for generating custom traffic. They have interfaces for connecting devices under test (DUTs).

NOTE	The "TestPorts" shown in the preceding diagram are displayed as Ports in the IxLoad GUI.
NOTE	Compute Nodes must have a functional Management Node to operate.
NOTE	The bandwidth of each physical NIC shown in the diagram (consisting of 2 x 100G interfaces) is limited to 100G.

Rack mounting

The following guidelines are provided to optimize the device performance.

- Make sure cabling is away from sources of electrical noise. Radios, power lines, and fluorescent lighting fixtures can interfere with the device performance.
- Make sure the cabling is positioned away from equipment that can damage the cables.
- Operating environment is within the ranges listed in the data sheet and installation guide.
- Make sure airflow around the APS-M1010/APS-ONE-100 and respective vents is unrestricted.

To rack mount the APS-M1010/APS-ONE-100 chassis:

1. Pull the inner rail out of the slide rail until it clicks.

2. Detach the inner rail completely from the slide rail by pulling the white tab forward.
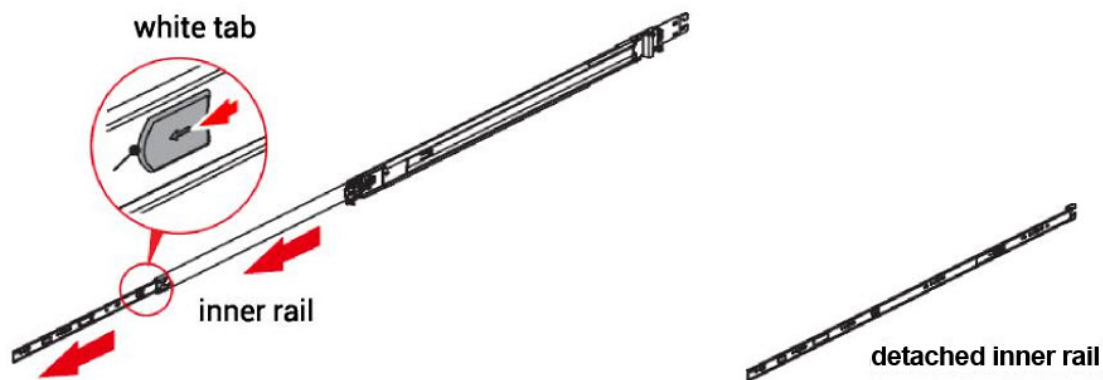
3. After the inner rail is dislodged, adjust the middle rail back to its original position by pushing the tab on the middle rail.
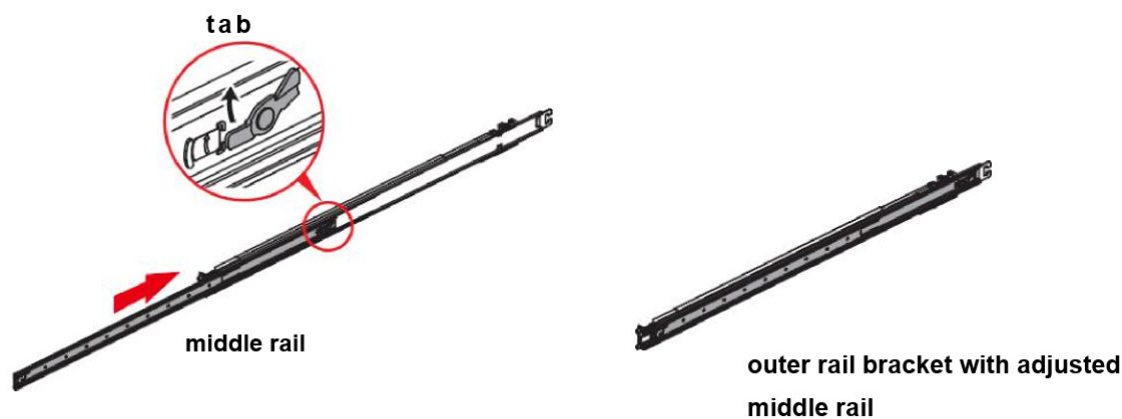
4. Install the inner rail onto the system barebone. Lock the keyholes and secure the screws on sides of the system.

Keyhole

M4X4L
screw
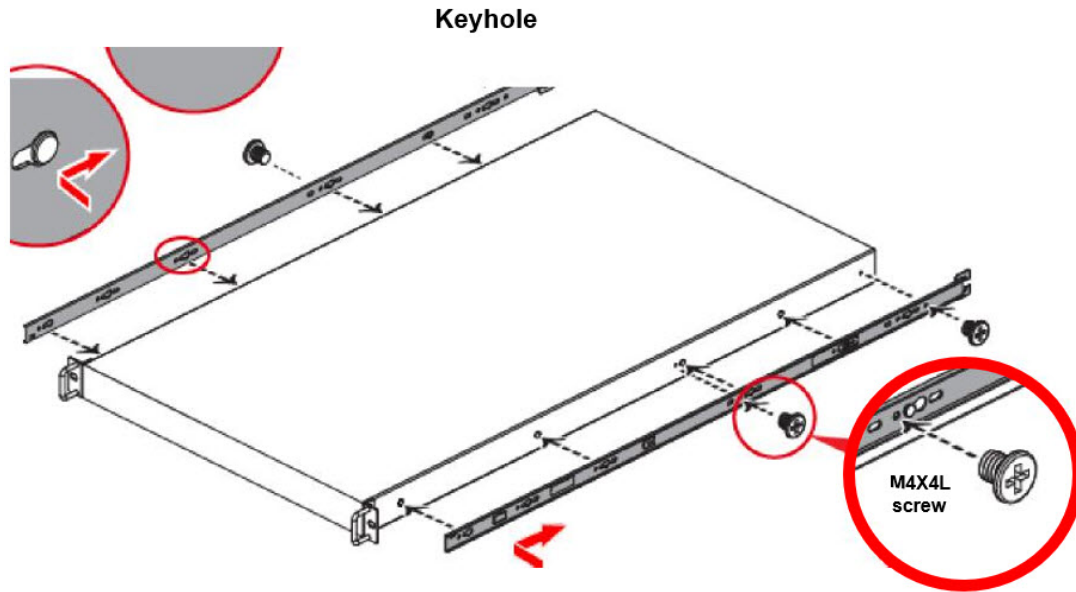
5. Continue installing the outer rail bracket to the mounting frame. Attach the outer rail assembling to the frame and press the bracket to form a rack on both ends. Repeat to fully mount the bracket assembly on the other side.
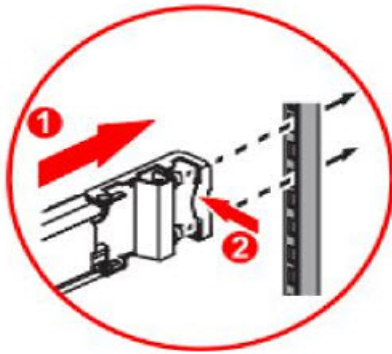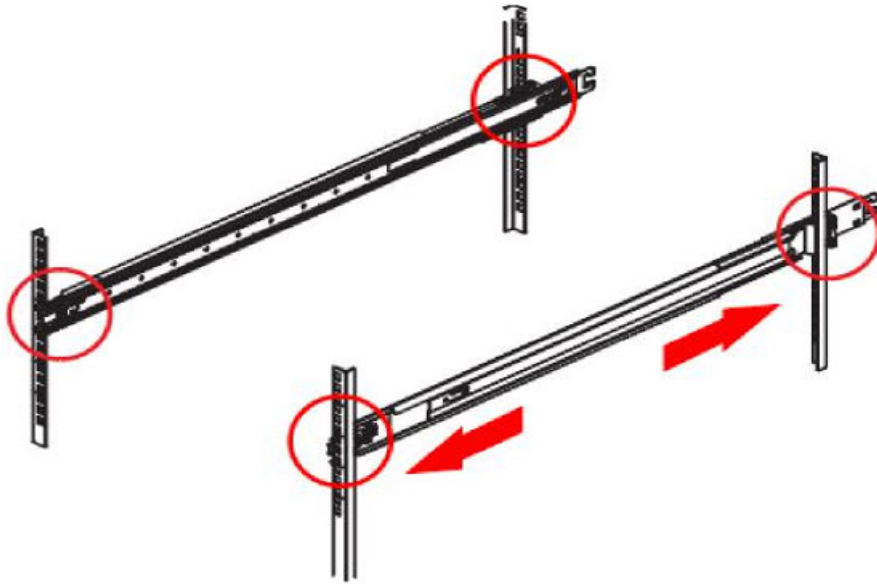
Attach and press bracket.   **Bracket secured.**
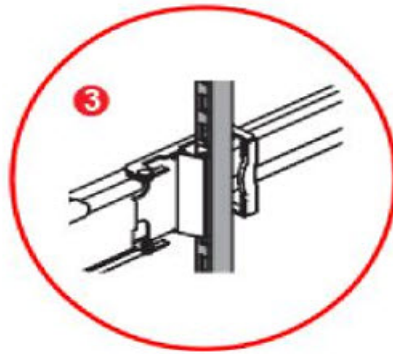
6. Pull out the middle channel until the ball bearing retainer is locked forward.
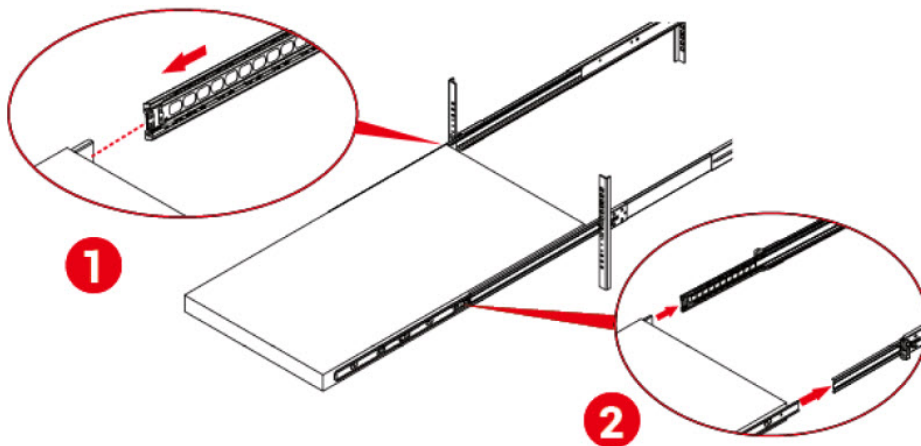
NOTE   Verify ball bearing retainer is locked forward.

7. Slide the release tab and push barebone into rack. Make sure the barebone is completely installed onto the rack.
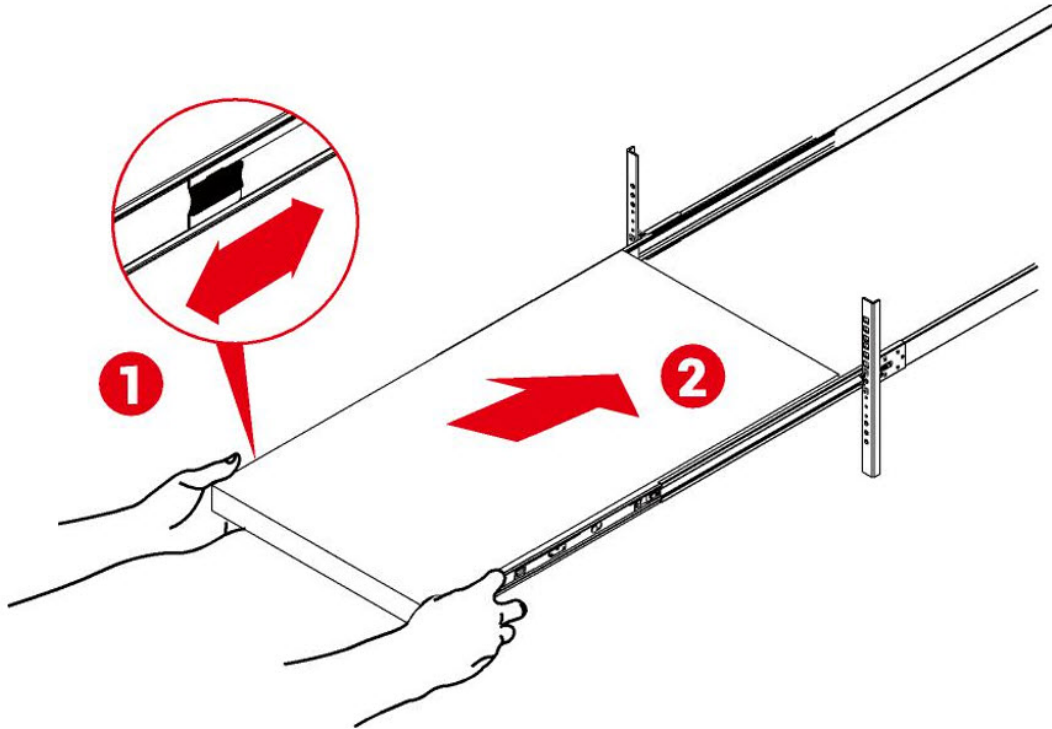
8. Repeat this procedure until all components are rack mounted.

Aggregation modes

IxLoad on the M1010/APS-ONE-100 Platform supports two modes:

- **Mode 1** - Aggregated Mode (default mode)
- **Mode 2** - Non-Aggregated Mode

IMPORTANT	Switching between aggregation modes is not recommended at this time. This functionality will be supported in a future release.

Mode 1 - Aggregated mode (default mode)

Aggregated mode is the default mode.

In the Aggregated mode, two Test Ports are mapped to a single physical port as shown in the preceding diagram. All traffic will be sent and received through these physical ports (Port-1 and Port-3 in the diagram) which are active links.

- TestPort-1 and TestPort-2 are mapped to physical Port-1
- TestPort-3 and TestPort-4 are mapped to physical Port-3

NOTE	These specific port mappings are required but this limitation will be removed in a future release.

In this mode, the user needs to assign TestPort-1 and TestPort-2 together in a NetTraffic configuration. Similarly, TestPort-3 & TestPort-4 need to be assigned together in a NetTraffic configuration.

NOTE	There are twoTestPorts in a NetTraffic configuration. This will require at least two IP addresses in an IP-Range.

Mode 2 – Non-Aggregated mode

In this mode:

- Each TestPort needs to be mapped to an individual physical Port.
- TestPorts can be assigned to different NetTraffic configurations

Mode - 2 (Non-Aggregated mode): APS-ONE-100
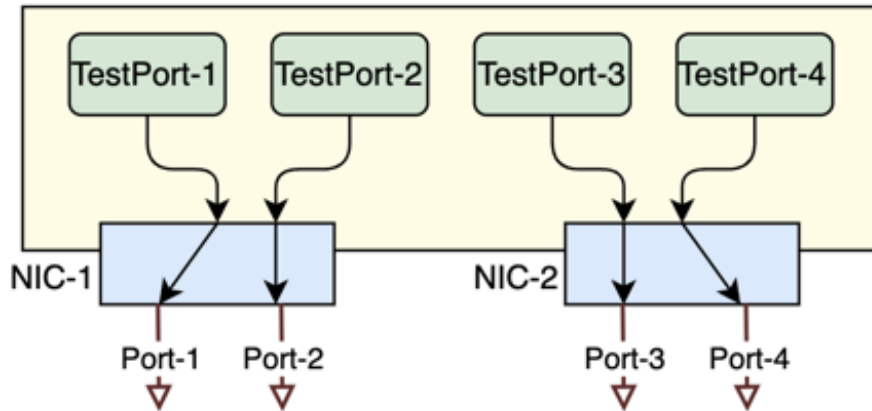
| NOTE | The preceding diagram is an example of one of the supported TestPort-to-physical-port configurations. TestPort-1 could be mapped to Port-2, TestPort-2 could be mapped to Port-4, etc. |

CHAPTER 3
Port aggregation

IxLoad on the M1010/APS-ONE-100 Platform supports an Aggregated Mode (default mode) and a Non-Aggregated mode.

- Aggregated Mode (default mode)
- Non-Aggregated Mode
- How to configure the Aggregation mode

Mode 1 - Aggregated mode (default mode)
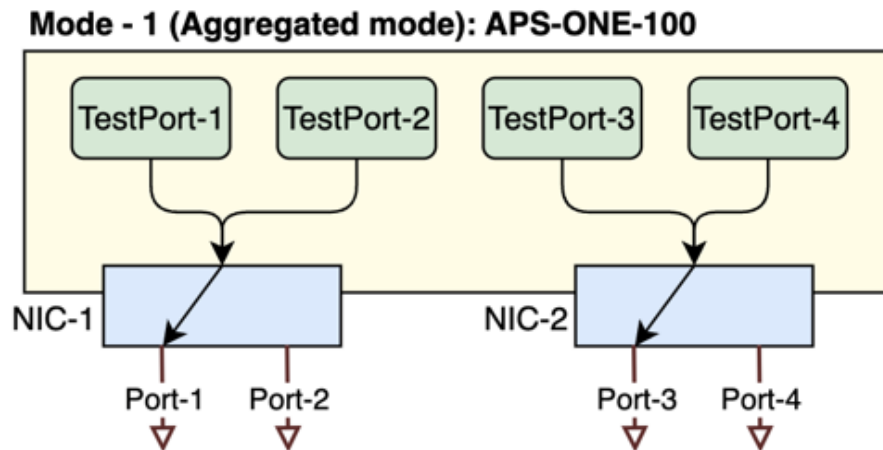
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In the Aggregated mode, two Test Ports are mapped to a single physical port as shown in the preceding diagram. All traffic will be sent and received through these physical ports (Port-1 and Port-3 in the diagram) which are active links.

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- TestPort-3 and TestPort-4 are mapped to physical Port-3

NOTE	These specific port mappings are required but this limitation will be removed in a future release.

In this mode, the user needs to assign TestPort-1 and TestPort-2 together in a NetTraffic. Similarly, TestPort-3 & TestPort-4 need to be assigned together in a NetTraffic.

NOTE	There are two TestPorts in a NetTraffic configuration. This will require at least two IP addresses in an IP-Range.

Mode 2 – Non-Aggregated mode

In this mode:

- Each TestPort needs to be mapped to an individual physical Port
- TestPorts can be assigned to different NetTraffics

Mode - 2 (Non-Aggregated mode): APS-ONE-100
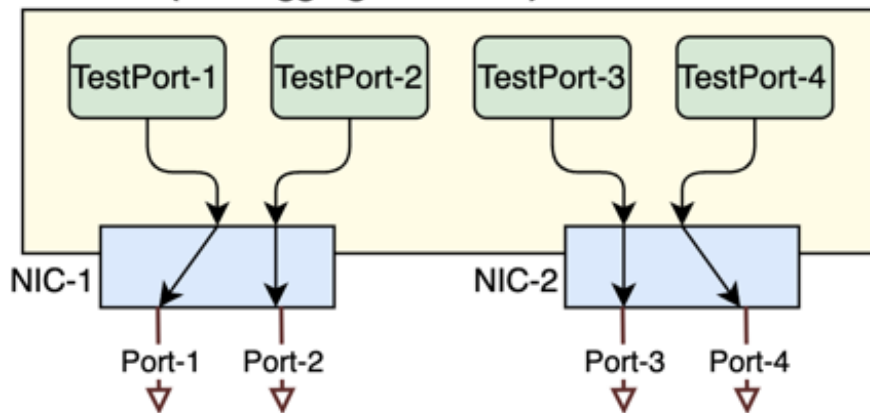
| NOTE | The preceding diagram is an example of one of the supported TestPort-to-physical-port configurations. TestPort-1 could be mapped to Port-2, TestPort-2 could be mapped to Port-4, etc. |

How to configure the Aggregation mode

In the IxLoad UI, you use use a card's context menu to select the aggregation mode as shown in the following image.
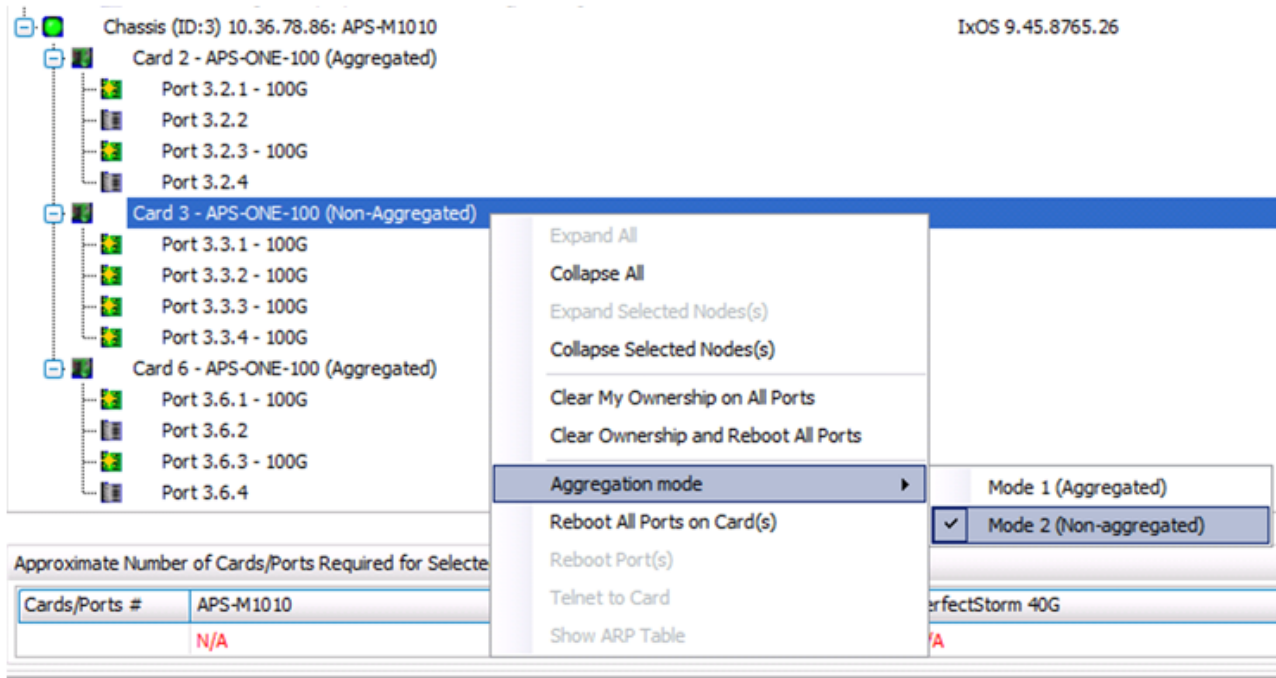
| NOTE | In Aggregated mode, you cannot select an individual TestPort. When TestPort 1 is selected, TestPort-2 will automatically be selected. The secondary port will appear to be grayed out in Aggregated mode. |

CHAPTER 4
Related documentation

The latest documentation for each release can be found on the Ixia Support website.

Documentation	Description
APS-M1010/APS-ONE-100 Release Notes	Provides information about new features, resolved customer issues, known defects and workarounds (if available).
APS-100/400GE Series Plaform, KCOS Command Line Interface (CLI), For IxLoad Release 9.45, CLI Reference Guide	This guide describes the commands that make up the command-line interface (CLI) for the APS-M1010/APS-CN100.
IxLoad User Guide	Provides information on how to use IxLoad to set up, run and customize tests.

CHAPTER 5
Unpacking and inspection

Carefully unpack the APS-M1010/APS-ONE-100 Platform components. Each node that is described below is shipped in its own box.

One Management Node

- 1U APS-M1010 Management Node
- 2 power cords region specific
- 1 Tool-less Rackmount Rail Kit
- 1 Micro USB to USB A cable

Up to 10 x APS-ONE Compute Nodes

Each box contains:

- 1U APS-ONE-100 Compute Node
- 2 power cords region specific
- 1 Tool-less Rackmount Rail Kit
- 1 Micro USB to USB A cable
- 1 Ethernet cable

CHAPTER 6
Front panel indicators

**LED
Indicators**

**Luggage tag and
2 USB ports**

Item	Description
⏻	Power button
🔆	Power status LED indicator
🗄	Drive activity LED indicator
🖧	LAN LED indicator
⚠	System alert LED indicator
◎	System reset LED indicator
◎	Reset button
Luggage tag	Shown on the preceding chassis image
2 x USB 3.0 Type a port	Shown on the preceding chassis image

The MN hostname is provided on the MN luggage tag as shown in the following example. The format is `APS-M1-TW<serial#>`. For example, the hostname that you will write in the URL field for this unit would be, "APS-M1-TW12345678".

CHAPTER 7
Management Node and Compute Node ports and connectivity

Management Node (APS-M1010)

- RJ-45 Port labeled "D" (blue): 1 GE port that connects the APS-M1010 management port to the lab network.

- RJ-45 Ports 1 -10 (white): Ports that are used to connect and manage Compute Nodes.

NOTE   Ports 1 – 10 correspond with slots 2 – 11 in the IxLoad user interface. For example, a Compute Node connected to port 4 will be managed on slot 5 in the IxLoad UI.
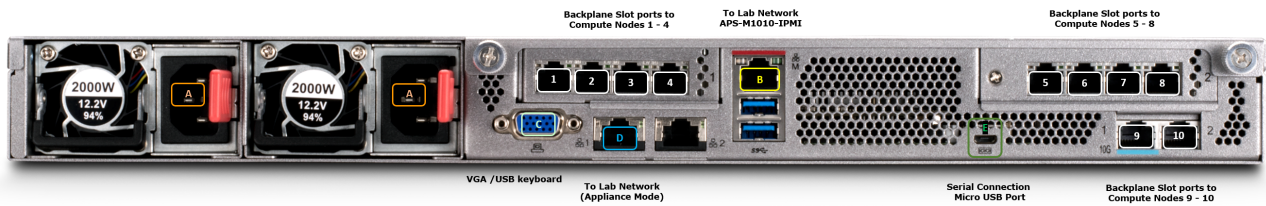
Compute Node (APS-ONE-100)

- Managed Mode: RJ-45 Port 1 (white): Connects Compute Node to a Management Node Port (1 – 10 as shown in the image above).

- Appliance Mode: RJ-45 Port 1 (white): Connects to Lab Network when used in stand-alone appliance mode.
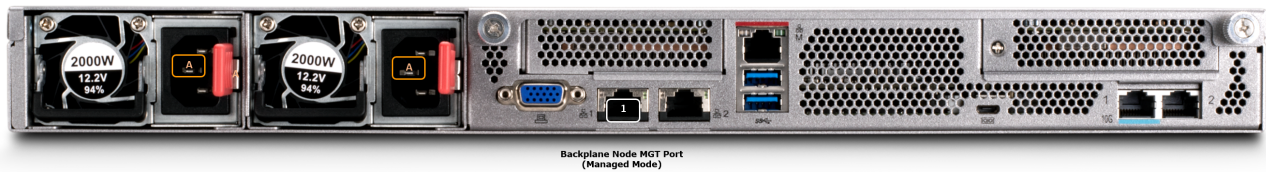
Optional Connections for Debug - Management Node (APS-M1010) and Compute Node (APS-ONE-100)

- Serial Connection Micro USB port labeled "E" (dark green): Provides access to the KCOS Console/Shell over the serial terminal for initial
configuration.
    - Baud:115200, data bits: 8, stop bits 1, parity: None, flow control: XON/XOFF.

- VGA /USB keyboard labeled "C" (light green): Provides access to the KCOS Console/Shell when using a monitor and directly connected keyboard.
- RJ-45 Port labeled "B" (yellow): IPMI 1 GE port connects to the lab network. Provides dedicated IPMI networking for remotely managing the server state.

NOTE | Access to the KCOS Console using either a serial or VGA/Keyboard connection will be required to setup the initial IP address for the management interface of the Management Node / standalone node. After configuring the network settings on the management interface, remote administration using an SSH connection to this management IP address/system hostname will be available. The factory default login for the console is **admin** with password **admin**.

CHAPTER 8
Connect power to the Management Node and Compute Nodes

1. Connect supplied power cords into the power cord sockets of the chassis.
2. Plug the power cords into appropriate power receptacles.

Note the following power specifications:

Input Voltage	100-127 V AC/200-240 V AC, 50-60 Hz, 15/10 A (x2)
Power Supply Operating Mode	(1) Redundant PSU 1+2 1+1 100-127 V AC/200-240 V AC (2) Single Supply PSU 1 1+0 100-127 V AC/200-240 V AC (3) Single Supply PSU 2 0+1 100-127 V AC/200-240 V AC
Power Cords	15A,250V,C13 TO C14,6 FT (x2) – Included
Max Power Requirement	941-0110 – 1200 W 941-0113 – 600 W

CHAPTER 9
Connect DUTs for testing

Each Compute Node supports up to two 100GE active ports for testing as shown in the following diagram. Please connect ports 1 and 3 on each compute node QSFP28 interface to run emulated traffic.
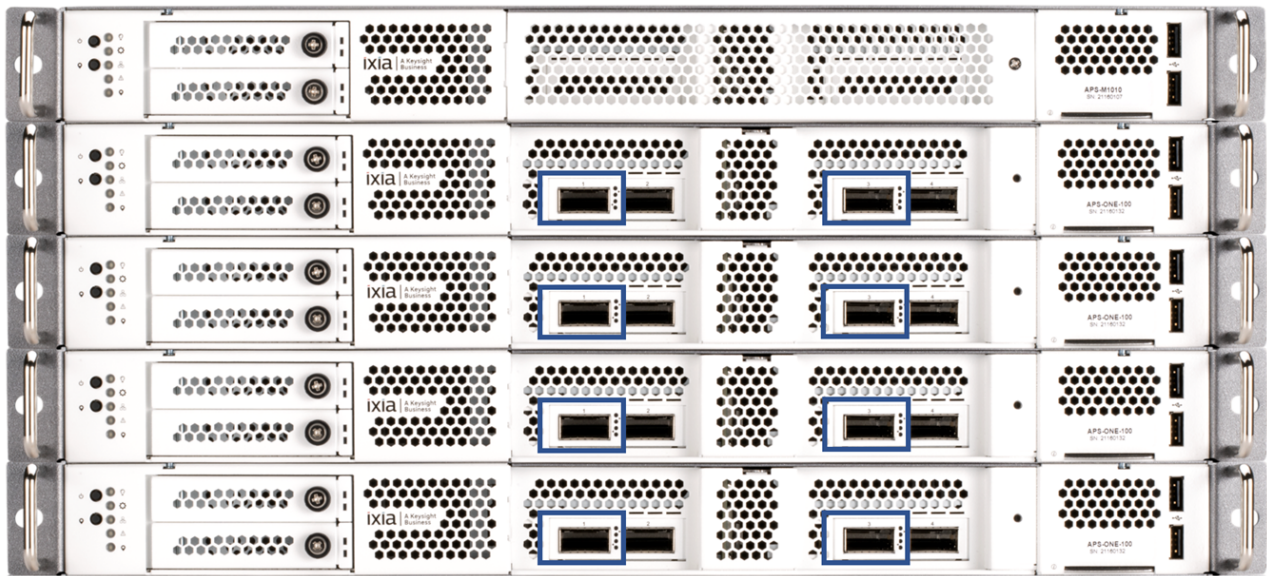
Port 1 of each Compute Node

Port 3 of each Compute Node

CHAPTER 10
Install software packages

As part of the APS-M1010/APS-ONE-100 Platform installation for IxLoad, you need to install software packages, as described in this topic.

- Before installing the software below
- Management server updates below
- IxLoad package download on the next page

Before installing the software

Before upgrading the software, creating a snapshot is recommended. To create a snapshot of the current Management Node state, run the following KCOS command from the admin command line:

```
kcos snapshot create <alphanumerical name of snapshot>
```

Management server updates

There are two segments of software that can be updated for the management server:

- IxLoad Version: aps-ixload-x.y.z
- KCOS Version: aps-kcos-v.w.q

To install the software updates:

1. Open SSH to the MN and log in with admin/admin.
2. Copy the installation package from another system to the management node by using wget or scp.
   For example:
   ```
   wget ftp://someserver/aps-kcos-9.17.9+20210505.081022.fa1344de-offline.tgz
   ```
3. Use the KCOS deployment service to install the package:
   The command syntax is `kcos deployment offline-install <offline_package_name>`.
   For example:
   ```
   kcos deployment offline-install aps-kcos-9.17.9+20210505.081022.fa1344de-offline.tgz
   ```

Refer to the KCOS CLI Reference Guide for more information about the KCOS commands.

IxLoad package download

Follow these steps to download the IxLoad package that is required by the APS-M1010/APS-ONE-100 Platform:

1. Open the https://support.ixiacom.com/ Downloads & Updates portal, then select IXOS 9.45.

2. From the IXOS 9.45 page, select the APS-M1010/APS-ONE-100 Platform.

3. Download the `ixloadPackage.tar.gz` file from the Software Packages section of the page.

4. From any external system, execute the following command (from a Windows Command Prompt or from any Linux Terminal) to transfer the package to the APS-M1010/APS-ONE-100 Platform system:

```
curl -X POST -F file=@ixloadPackage.tar.gz http://<APS-M1010-
IP>:30081/uploadIxLPackage
```

Upon successful completion of transfer, you should see the following message:

```
File uploaded successfully: ixloadPackage.tar.gz
```

CHAPTER 11
Add IxLoad-ATI licenses

NOTE	A license is required for each compute node.

1. Log in to the KCOS admin shell as **user**: admin **password**: admin

2. Execute the following command:

```
kcos licensing licenses activate --fulfillments=<activation_code>:<number_of_licenses>
```

3. The following command be run to get additional details:

```
kcos licensing --help
```

CHAPTER 12
Accessing the IxLoad user interface

NOTE	This procedure assumes that your MN network has a DNS and DHCP server. If not, please configure a static IP address as described in <u>Accessing the IxLoad user interface above</u>. Then proceed to step 2 shown below.

After the MN has been booted for 10-15 minutes, the MN hostname should be registered with your DNS.

1. Log in to the KCOS CLI.

   The MN hostname is provided on the MN luggage tag as shown in the following example. The format is APS-M1-TW<serial#>. For example, the hostname that you will write in the URL field for this unit would be, "APS-M1-TW12345678".

2. Log in to the IxLoad UI. If the username and password are not present on the MN luggage tag, use: Username: **admin** | Password: **admin**.

NOTE	If this access method does not work, there may be network issues. Please perform the IP Configuration using the KCOS CLI procedure or troubleshoot the issue.

3. Proceed to the <u>Assigning ports to an IxLoad test on page 32</u>section of this document.

IP Configuration using the KCOS CLI

1. Connect to the MN server:
   a. Connect to the micro-usb serial interface at the back of the MN (baud:115200, data bits: 8, stop bits 1, parity: None, flow control: XON/XOFF).
   b. Connect a display monitor to the VGA interface at the back of the MN.
   c. Connect a keyboard to one of the MN USB interfaces.

   NOTE   If the MN is booted when the USB-serial is connected, the MN will attempt to boot from USB and prevent the configuration of the BMC and MN IP address.

2. At the KCOS CLI "login:" prompt, type `console`. Then select the **enter** key.

3. You will be prompted to log in again. Log in with the username and password provided on the luggage tag. If a username and password are not listed on the luggage tag, log in as **Username**: admin | **Password**: admin (a luggage tag example is shown in the preceding image).

4. To **display the MN IP address**, type `kcos networking ip show`

   An example output is displayed below.

   NOTE   The first IP address displayed in the following image is the system IP address. The second IP address that is displayed is for internal use and should not be used.

```
ipaddresses:        10.36.5.109/23 169.254.203.93/16
macaddress:         00:15:b2:af:09:a1
state:              UP
gateways:           []
dhcpv4:             true
dhcpv6:             true
```

5. **Configure the MN IP** (mgmt0) **address**.
   a. At the prompt type: `kcos networking ip set --help`. Then select the **enter** key to see the available parameters.
   b. Set the MN IP address. Examples are shown in the following image.

   NOTE   IP addresses in the following subnet ranges should be avoided because they can cause problems with internal system communications:
   - 192.168.99.0/24
   - 192.168.248.0/21

```
Usage:
 set [-h] <interface> (<dhcp/dhcpv4/dhcpv6>) || (<IP/subnet> <gateway>)
Example:
 set mgmt0 dhcp
 set mgmt0 dhcpv6
 set mgmt0 10.36.81.43/22 10.36.80.1
 set mgmt0 2600::100/16  2600::1
```

> **NOTE** The local network should not be in the subnet 192.168.0.0/24 which is used for internal communication.

6. Optionally, to configure additional IP settings/troubleshoot connectivity issues, you may want to run the following IP configuration commands:

   a. kcos networking hostname show

   b. kcos networking hostname set <new hostname>

   c. networking dns-servers show

   d. networking dns-servers delete

   e. networking dns-servers add <dns server ip>

CHAPTER 13
Assigning ports to an IxLoad test

Once you have installed the APS-M1010/APS-ONE-100 Platform and connected your test ports, you can start assigning ports to your IxLoad tests. For this platform, IxLoad supports an Aggregated Mode (default mode) and a Non-Aggregated mode.

- Port assignment below
- Aggregating ports on the next page

Port assignment

1. Start IxLoad, then open (or create a new) IxLoad test.

2. Select **Ports** in the Navigation pane.
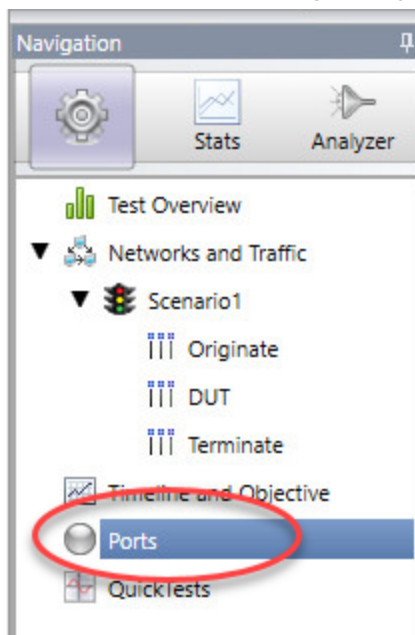
3. If the APS-M1010/APS-ONE-100 Platform you want to use is not listed in the Chassis Chain pane, click the **Add Chassis** button. IxLoad connects to the chassis and adds it and its ports to the Chassis Chain.

4. In the Chassis Chain pane, select the ports that you will use for the test.

5. Assign the ports using either of these methods.
    - In the Assigned Ports pane, select the NetTraffic that you want to add the port to. The yellow arrow indicates the currently selected NetTraffic. Select a port, then click the **Assign Port** button.
    - Drag the port to the NetTraffic.

Aggregating ports

In the IxLoad UI, you use use a card's context menu to select the aggregation mode as shown in the following image.
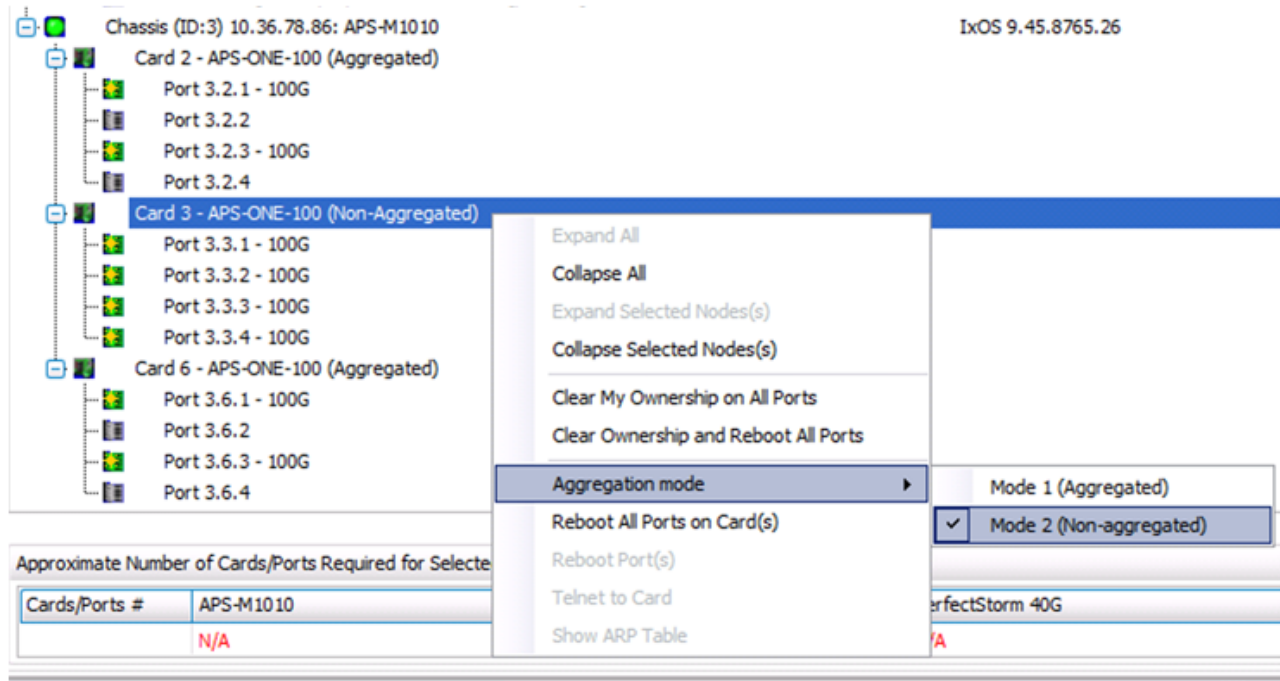
	NOTE	In Aggregated mode, you cannot select an individual TestPort. When TestPort 1 is selected, TestPort-2 will automatically be selected. The secondary port will appear to be grayed out in Aggregated mode.

APPENDIX A
Regulatory Compliance information

Before setting up and using the unit, read all of the safety and environmental information in this section and take all necessary measures to ensure your safety and to comply with environmental regulatory requirements that are in effect in your location.

Regulatory specifications

Safety	• UL 62368-1 / CSA C22.2 No. 62368-1
	• EN 62368-1 / IEC 62368-1
Emissions and Immunity	• FCC Part 15B, Class A
	• CAN ICES-003(A)/NMB-003(A)
	• EN 55032 Class A / EN 55035 / EN 61000-3-2 / EN 61000-3-3
	• AS/NZS CISPR 32 Class A
Regulatory Approvals	• UL (USA, Canada)
	• CE (Europe)
	• UKCA (United Kingdom)
	• RCM (Australia)
Environmental	• RoHS Directive 2011/65/EU; Annex II, Directive (EU) 2015/863
	• WEEE Directive 2012/19/EU
	• China RoHS

Regulatory marks

This unit conforms to the regulatory standards listed in the following table.

Regulatory compliance	Regulatory mark	Description
CE Mark (EU self-declaration conformity mark for EMC and Safety)	$C \epsilon$	EU conformity mark for EMC and Safety. Product meets all applicable EU Directives.
UKCA Mark (United Kingdom Conformity Assessed)	UKCA	UK conformity mark for EMC and Safety. Product meets all applicable UK Regulations.
UL (Underwriters' Laboratories) Safety Mark	c (UL) us LISTED	Demonstrates that the product has been tested and verified to applicable standards by UL NRTL. Démontre que le produit a été testé et vérifié selon les normes applicables par UL NRTL.
FCC (Federal Communications Commission) Compliance Statement	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.	Demonstrates compliance with the requirements of 47 CFR FCC Part 15B.
Canadian EMC Equipment Standard	CAN ICES-3(A)/NMB-3(A)	IC Compliance Statement with the Canadian Interference-Causing Equipment Standard (ICES) Classification of Information Technology Equipment (ITE). unit: Innovation, Science and Economic Development Canada ICES-003 Compliance Label: CAN ICES-3(A)/NMB-3(A). Déclaration de conformité d'IC à la classification des équipements de technologie de l'information (ITE) de la Norme canadienne sur les équipements causant des interférences (ICES).

Regulatory compliance	Regulatory mark	Description
Australian RCM Mark		The RCM mark is a registered trademark of the Australian Communications and Media Authority.
Restriction of Hazardous Substances (RoHS)		Indicates that the product complies with the requirements of the RoHS European Directive 2011/65/EU (as amended).
WEEE Mark		The crossed out wheeled bin symbol indicates that separate collection of waste electric and electronic equipment (WEEE) is required, as obligated by the EU DIRECTIVE and other National legislation. Refer to keysight.com/go/takeback to understand your trade-in options with Keysight, in addition to product take-back instructions.
China RoHS – EFUP Label 20 years		This symbol indicates the time period (20 years) during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use.
Recycling Symbol		Use of this symbol (Mobius Loop) indicates that the item can be recycled.

APPENDIX B
Troubleshooting

Basic debugging and troubleshooting

If there are issues with the functionality of IxLoad on the Keysight APS-M1010/APS-ONE-100 Platform, the following steps may help to resolve the issue.

1. Check interface status for all Compute Nodes:

```
(kcos)-APS-M1-TW22110110:/home/admin$ kcos netif diagnostics config show --regex cn-aps
--regex eaglefp
+------+---------------------+-------------+------+--------+-----+-------------------
--+
| SLOT | NODE | INTERFACE | LINK | SPEED | FEC | MEDIA |
+------+---------------------+-------------+------+--------+-----+-------------------
--+
| 2 | cn-aps-o1-tw23060130 | eaglefp0fo0 | UP | 100000 | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp1fo0 | DOWN | | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp2fo0 | UP | 100000 | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp3fo0 | UP | 100000 | rs | direct_attach_copper |
+------+---------------------+-------------+------+--------+-----+-------------------
--+
| 3 | cn-aps-o1-tw23060116 | eaglefp0fo0 | UP | 100000 | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp1fo0 | DOWN | | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp2fo0 | UP | 100000 | rs | direct_attach_copper |
+ + +-------------+------+--------+-----+----------------------+
| | | eaglefp3fo0 | UP | 100000 | rs | direct_attach_copper |
+------+---------------------+-------------+------+--------+-----+-------------------
--+
```

2. Reboot ports from the IxLoad UI.

3. Reboot a Compute Node (hot swap) from the KCOS CLI.

4. Connect to IPMI IP to perform power cycle using the following URL.

   https://<IPMI addr> [Login as admin/admin]

5. Power cycle using the Web-UI that displays.

Check Compute Node connectivity

1. Connect to your APS-M1010/APS-ONE-100 Platform Management Node using SSH and log in with admin/admin.

2. Each node should show ready when listed using:

```
kcos system introspection nodes show
```

```
(kcos)-eagle-mb004:~$ kcos system introspection hosts show

NAME            HOSTNAME              IP                VENDOR CLASS
--------------  --------------------  ---------------   ------------------------
h-0015b2af092d  cn-APS-C1-TW20230114  192.168.99.109    Keysight:KCOS:Volatile
h-0015b2af0961  cn-515-20080500200004 192.168.99.161    Keysight:KCOS:Volatile
h-0015b2af097d  cn-APS-C1-TW20230115  192.168.99.189    Keysight:KCOS:Volatile
h-0015b2af0999  cn-APS-C1-TW20230110  192.168.99.217    Keysight:KCOS:Volatile
h-0015b2af099b  aps-c1-fk20020000-bmc 192.168.99.219    udhcp 1.21.1
h-0015b2af099f  <na>                  192.168.99.223    udhcp 1.21.1
--------------  --------------------  ---------------   ------------------------

(kcos)-eagle-mb004:~$ kcos system introspection nodes show

NAME                   STATUS   ROLES    VERSION  INTERNAL-IP     OS-IMAGE                                            KERNEL-VERSION    CONTAINER-RUNTIME
---------------------  ------   -------  -------  --------------  -------------------------------------------------   ----------------  -------------------
cn-515-20080500200004  Ready    compute  v1.17.4  192.168.99.161  Ubuntu 20.04.3 LTS KCOS 0.27.8+20210902.234043.91979f18  5.4.0-66-generic  docker://20.10.7
cn-aps-c1-tw20230110   Ready    compute  v1.17.4  192.168.99.217  Ubuntu 20.04.3 LTS KCOS 0.27.8+20210902.234043.91979f18  5.4.0-66-generic  docker://20.10.7
cn-aps-c1-tw20230114   Ready    compute  v1.17.4  192.168.99.109  Ubuntu 20.04.3 LTS KCOS 0.27.8+20210902.234043.91979f18  5.4.0-66-generic  docker://20.10.7
cn-aps-c1-tw20230115   Ready    compute  v1.17.4  192.168.99.189  Ubuntu 20.04.3 LTS KCOS 0.27.8+20210902.234043.91979f18  5.4.0-66-generic  docker://20.10.7
master.kcos            Ready    master   v1.17.4  192.168.99.1    Ubuntu 20.04.3 LTS KCOS 0.27.8+20210902.234043.91979f18  5.4.0-66-generic  docker://20.10.7
---------------------  ------   -------  -------  --------------  -------------------------------------------------   ----------------  -------------------
```

3. You can check the status of the slots and interfaces using:

```
kcos netif diagnostics config show
```

```
kcos> netif diagnostics config show
+------+-----------------------+-----------+------+--------+-----+----------------------+
| SLOT |         NODE          | INTERFACE | LINK | SPEED  | FEC |        MEDIA         |
+------+-----------------------+-----------+------+--------+-----+----------------------+
|    3 | cn-aps-c1-tw20230114  | eaglefp0  | UP   | 100000 | rs  | fibre                |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp1  | UP   | 100000 | rs  | fibre                |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp2  | UP   | 100000 | rs  | fibre                |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp3  | UP   | 100000 | rs  | fibre                |
+------+-----------------------+-----------+------+--------+-----+----------------------+
|    5 | cn-aps-c1-tw20230115  | eaglefp0  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp1  | UP   | 100000 | off | fibre                |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp2  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp3  | UP   | 100000 | off | fibre                |
+------+-----------------------+-----------+------+--------+-----+----------------------+
|    8 | cn-515-20080500200004 | eaglefp0  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp1  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp2  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp3  | UP   | 100000 | rs  | direct_attach_copper |
+------+-----------------------+-----------+------+--------+-----+----------------------+
|   11 | cn-aps-c1-tw20230110  | eaglefp0  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp1  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp2  | UP   | 100000 | rs  | direct_attach_copper |
+      +                       +-----------+------+--------+-----+----------------------+
|      |                       | eaglefp3  | UP   | 100000 | rs  | direct_attach_copper |
+------+-----------------------+-----------+------+--------+-----+----------------------+
```

APPENDIX C
KCOS Compute Node reboot (card hot swap)

NOTE	This operation is equivalent to the hot-swap operation that can be performed on traditional Keysight Load Modules (CloudStorm, PerfectStorm, etc.).

To reboot a compute node:

```
[root@XGSHS-608383 ~]# ssh admin@<management-node-ip>
## [Password: admin]
## [To fetch the compute node info of the corresponding slot number, that you want to
hot-swap]
(kcos)-APS-M1-TW22110110:/home/admin$ kcos netif diagnostics nodes show
+------+---------------------+
| SLOT | NODE |
+------+---------------------+
| 2 | cn-aps-o1-tw23060130 |
+------+---------------------+
| 3 | cn-aps-o1-tw23060116 |
+------+---------------------+
## [finally, restart the desired compute node]
(kcos)-APS-M1-TW22110110:/home/admin$ kcos system introspection node restart cn-aps-o1-
tw23060116 -p
Successfully restarted node cn-aps-o1-tw23060116 using BMC power-cycle command.
```

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