

MS2920 – Getting Started | Common Network for Management and Payload Traffic

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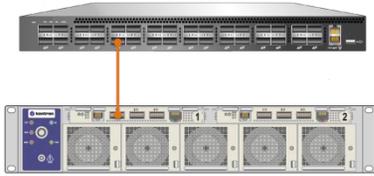
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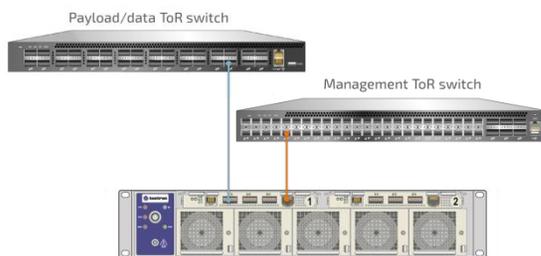
1/ Introduction

This use case describes the network integration steps to get started with the MS2920 platform where all traffic (management and payload data) passes over the same network link (100Gbps or 25Gbps).



Kontron created other use cases. You may refer to them if you want to:

- ▶ Create physically isolated management and payload networks



That use case describes the network integration steps to get started with the MS2920 platform where the traffic (management and payload data) passes over two network links from two different switches that are physically isolated.

Note that each MS2920 platform—like most rack-mounted deployments—contains redundant switches.

It is recommended that you identify the appropriate upstream topology with the help of the IT/network personnel managing the upstream network hardware and configuration. This will facilitate the process down the road.

Each section in this application note contains an introduction with general information, followed by steps to perform platform configuration. The sections covered are as shown in black on the flow diagram below.



1.1. Platform Architecture

The architecture and components of an MS2920 platform are similar to those of a rack in a data center. The platform contains the equivalent of 2 top-of-rack (ToR) switches and up to 18 servers internally interconnected within the platform, all in a 2U chassis.

Figure 1: Platform architecture

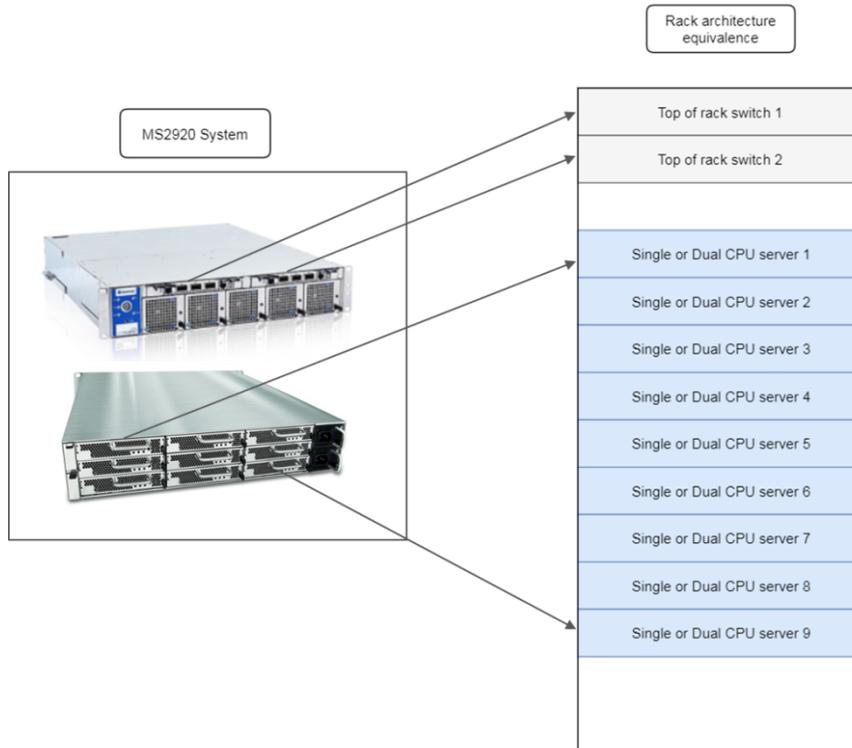


Figure 2: Faceplate connectors and LEDs

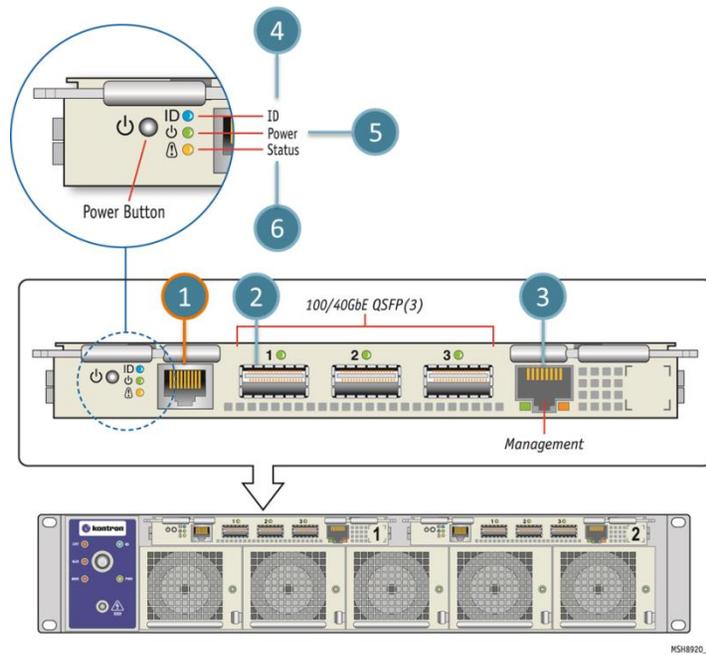


Table 1: Faceplate connectors and LEDs

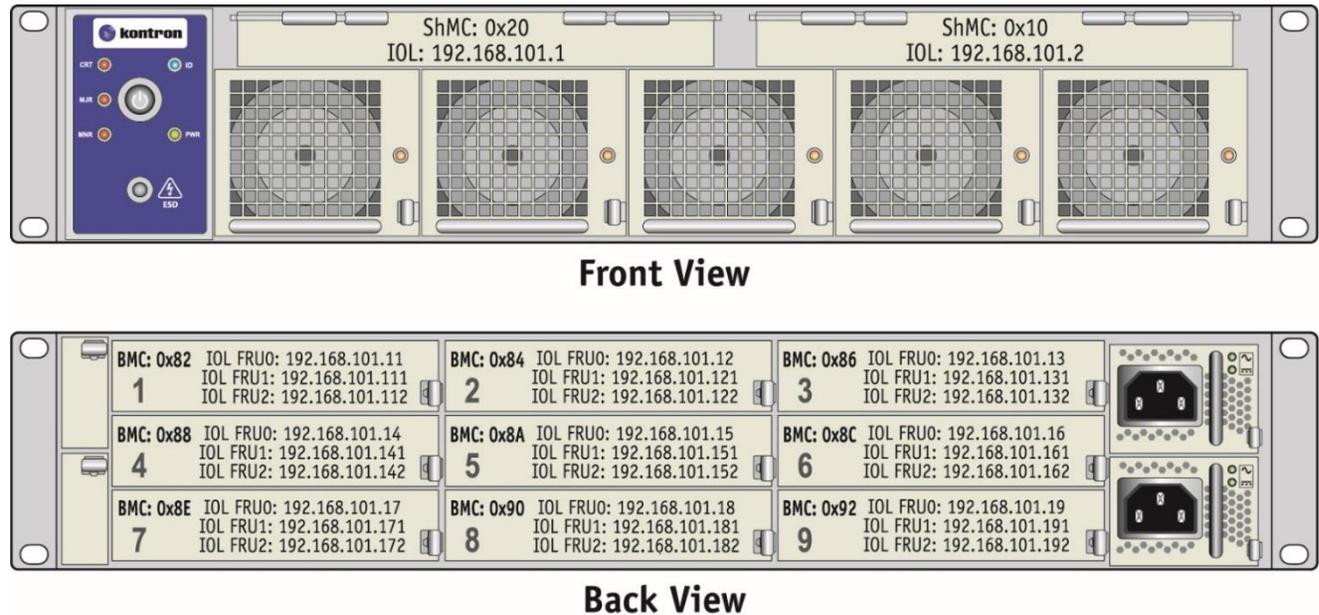
Label	Description	Faceplate marking
1	Console RJ-45 port	1010
2	3x 100GbE SFP+ uplink ports	1, 2, 3
3	Management 1GbE RJ-45 port	MNGT
4	ID LED (Blue): <ul style="list-style-type: none"> ▶ Management power is present = On ▶ Active hub = Blinking ▶ Payload power removed = Off 	None
5	Power LED (Green): <ul style="list-style-type: none"> ▶ Payload power is on = On ▶ Hub hosts the active ShMC = On ▶ Hub hosts the standby ShMC = Blinking ▶ Payload power removed = Off 	None
6	Status LED (Amber): <ul style="list-style-type: none"> ▶ Hub "not healthy", needs attention = On ▶ Hub transitioning when power button pressed (clean shutdown request) = Blinking ▶ Hub operating under normal conditions = Off 	None

The switch with shelf management controller (ShMC) are referred to as hubs in this document.

The SYMKLOUD platform comes with a System Monitor (SM). The SM includes a Web user interface and a programmatic API to access system components, including its ShMC and nodes.

The IOL IP address of the component you want to connect to might be required when using certain paths. The IP address of external entities must be in the same subnet as that of the SYMKLOUD components as no default gateway is configured. The default IOL IP addresses are shown in the following figure.

Figure 3: Factory default IP addresses



CP0011C_A



IOL FRU1 and IOL FRU2 addresses are required for certain MSP node models.

Hub IOL IP

The IOL IP of a hub (front view in [Error! Reference source not found.](#)) is the address of its ShMC. This IP is required to access the ShMC and the System Monitor. To access the System Monitor, the IP of hub 1 or of hub 2 can be used.

Switch Management IP

The switches of SYMKLOUD platforms have a switch management IP. This IP is required to remotely access the switch CLI.

- ▶ In MSH8920 series hubs, each switch is independently managed.
- ▶ The default switch management IP of a switch using PicOS is configured by DHCP.

2/ Initial Platform Connections



2.1. Introduction

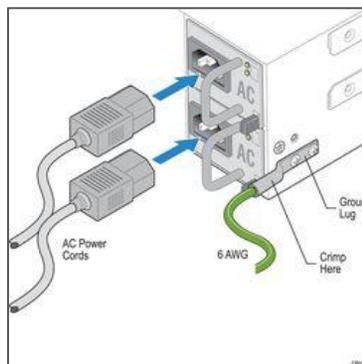
By completing the steps described in this section, you will have access to:

- ▶ The platform serial console used to access and configure management and payload components.

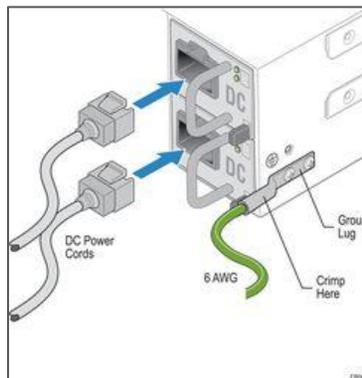
2.2. Power Supply Connection

Connect appropriately rated cables from an external power source to each power supply on the rear of the unit. The unit will power on as soon as external power is applied.

AC Power Supply



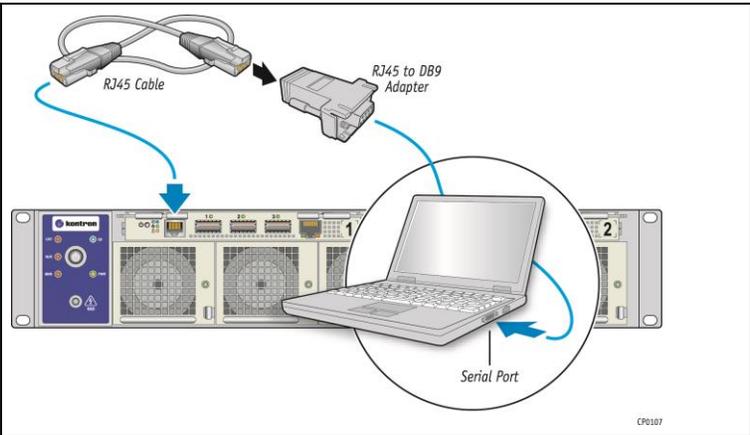
DC Power Supply



2.3. Serial Console Connection and Configuration

Use the RJ45 to DB9 adapter provided with the platform to connect a (non-crossover) Ethernet cable to establish a serial connection between the technician's PC and the RJ45 console port of the **hub with the active ShMC** (faceplate marking "10101"; see label 1 in Figure 2) of the MS2910.

The **hub with the active ShMC** is the one with the solid green Power LED (see label 6 in Figure 2). The hub with the standby ShMC has the blinking green Power LED.



Configure a serial console tool (e.g.: PutTY) with the correct COM-port for your system using the following parameters:

Parameters	Value
Speed (Baud)	115200
Data bits	8
Stop bits	1
Parity	none
Flow Control	none



You have now completed section Initial Platform Connections.

You should now have access to:

- ▶ The platform serial console used to access and configure management and payload components.

You can now proceed to section Switch Configuration.



3/ Switch Configuration



3.1. Introduction

By completing the steps described in this section, you will configure your switches in order to be ready to connect the MS2920 platform to your network infrastructure. Once the network cable is connected to the platform, you will have the ability to access the switch management interface.

NOTICE

Kontron strongly recommends working with facility IT/Network personnel because this platform contains redundant switches.

As with any switching appliance, undesired behaviors may occur within the network as a result of incomplete or inadequate configurations.

Prior to performing the steps described in Section 3/, speak with the IT/network personnel responsible for the hardware and configuration of the network into which the MS2920 platform will be deployed and share the following details:

1. This platform contains redundant switches.
2. Spanning Tree Protocol (STP) is enabled (by default on all ports).
3. Per VLAN Spanning Tree (PVST) and Multiple Spanning Tree Protocol (MSTP) compatibility are available.
4. Management and payload networks are segregated by VLAN.

Here is an example of a configuration that might be required on your ToR switch prior to connecting the MS2920 platform. The example is for a CN100 switch. The dot1q encapsulation command is essential for PVST or MSTP interoperability support; you will be required to select one of them when you scale up your network infrastructure to a complete multi-link redundant architecture.

Command	Purpose
localhost login: admin Password: admin admin@localhost:~\$ admin@localhost:~\$ sudo icos-cli (localhost) # (localhost) # vlan database (localhost) (Vlan)# vlan 10 (localhost) (Vlan)# exit (localhost) # configure (localhost) (Config)# interface vlan 10 (localhost) (Interface vlan 10)# ip address 192.168.101.254 255.255.255.0 (localhost) (Interface vlan 10)# exit (localhost) (Config)# interface 0/1 (localhost) (Interface 0/1)# switchport mode trunk (localhost) (Interface 0/1)# switchport trunk native vlan 10 (localhost) (Interface 0/1)# speed 100G full-duplex (localhost) (Interface 0/1)# mode dot1q- tunnel (localhost) (Interface 0/1)# fec (localhost) (Interface 0/1)# end (localhost) # write memory This operation may take a few minutes. Management interfaces will not be available during this time. Are you sure you want to save? (y/n) y Config file 'startup-config' created successfully .	Login the switch OS using admin/admin credentials Enter to the switch CLI mode. Enter in VLAN configuration mode. Add VLAN 10 to database. Exit VLAN database. Enter configuration mode. Enter interface VLAN configuration mode. Define VLAN 10 IP address and subnet. Exit interface configuration mode. Enter interface 0/1 configuration mode. Configure interface mode to trunking layer 2 VLAN port. Define the native VLAN for a trunk interface. Configure the speed of a given Ethernet interface to 100Gbps and force full-duplex operation. Configure dot1q encapsulation (IEEE 802.1Q is a standard protocol for interconnecting multiple switches and routers and for defining VLAN topologies). Enable FEC Return to Privileged EXEC mode. Save the configurations. Save the configurations.

The components used in the sample setup described in this application note are:

- ▶ CN100
- ▶ Kontron MS2920 platform (including MSH8920 hubs and modular server processing nodes running factory default configurations)

NOTICE

The instructions included below are provided as a reference for demonstration purposes only. Instructions may need to be adapted based on the network configuration and/or the hardware used.

3.2. Step-by-Step MSH8920 Switch Configuration

NOTICE

Once you have fully understood the steps described in Section 3/, you could paste multiple configuration commands all at once into the CLI to perform them all in one step. If you wish to proceed this way, refer to the instructions provided in Section 3.3 and adapt the command list example provided based on your network requirements.

3.2.1. Switch #1 Configuration steps

3.2.1.1. Log In the Switch CLI

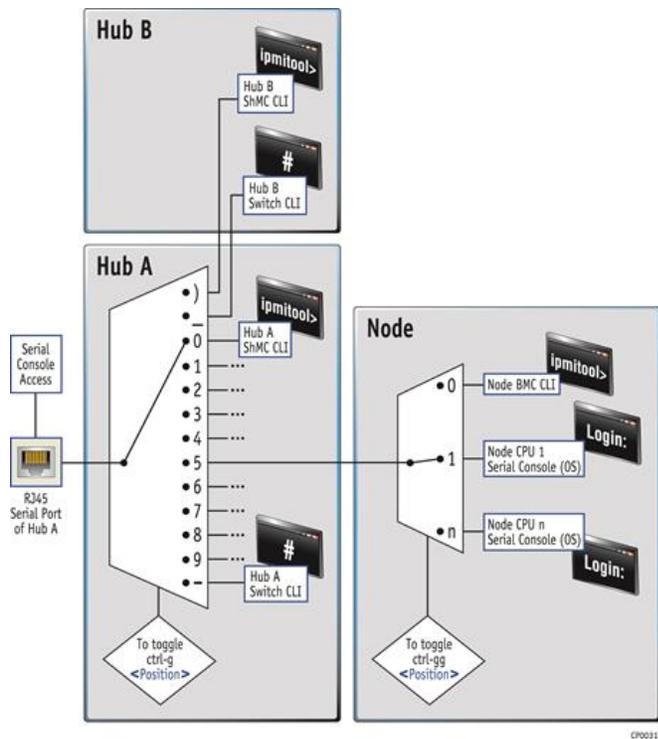
Log in using the default credentials—user: admin and password: admin.

Command	Purpose
kci-msh8920 login: Ctrl+g -	Use HOTKEY to redirect serial console multiplexer to the switch CLI of the first switch (H1).
Xorplus login: admin Password: admin	Enter switch credentials
admin@MSH8920:H1\$ cli admin@Xorplus>	Enter to the switch CLI mode.

The "Ctrl+g -" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on the Minus key followed by the Enter key.

The serial interface of the hubs (MSH8920) includes a multiplexing functionality that can establish a serial console link with each component of the platform through a series of hotkeys (Figure 4).

Figure 4: Interface paths with a serial console connection





The ASCII control code for "Ctrl-g" is 7. To type "Ctrl-gg", use the "Ctrl-g" ASCII control code twice in a row.

3.2.1.1. Change Portmap configuration (Optional)

Portmap Name	Front I/O Bandwidth	Backplane "Fabric" Bandwidth
3x100G_QSFP	QSFP 1-3 @ 100G	Slots 3,6,9 @ 2x10Gb Slots 1-2,4-5,7-8 @ 4x10Gb
9x40G_FABRIC (Default configuration)	QSFP 1,3 @ 100G QSFP 2 @ 40Gb	Slots 1-9 @ 4x10G

Two choices available, 3x 100GbE QSFP or 9x 40GbE FABRIC (default configuration)

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@Xorplus# set interface portmap 3x100G_QSFP	Choose which portmap is needed, then execute the command. (3x100G_QSFP or the default 9x40G_FABRIC)
admin@Xorplus# commit	Commit change
admin@Xorplus# exit	Exit the configuration mode.
admin@Xorplus> exit	Exit the switch CLI.
admin@MSH8920:H1\$ sudo reboot	Reboot the switch to apply the modification.
Xorplus login: admin Password: admin	Validate the interfaces, connect back to the switch.
admin@MSH8920:H1\$ cli	
admin@Xorplus> show interface brief	Show the current interfaces configuration.

3.2.1.2. Change Uplink to 4x 25GbE per 100GbE port (Optional)

By default, ports 1 and 3 have a speed of 100Gbps. To connect the platform to a switch with a speed of 25Gbps and use QSFP to 4x SFP+ transceivers, force uplink port to a breakout mode. *The breakout must be done on each individual 100GbE port.*

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@Xorplus# set interface gigabit-ethernet xe-1/1/1.1 breakout 25g-4x	Specify the interface to be configured. Interface 1xe-1/1/1.1 1 is used as our main uplink. All 100Gb ports need to be configured to the same "breakout" mode.
admin@Xorplus# set interface gigabit-ethernet xe-1/1/3.1 breakout 25g-4x	Do the same for the port 3 if required.
admin@Xorplus# commit	Commit the configuration.
admin@Xorplus# exit	Exit the configuration mode.
admin@Xorplus> exit	Exit the PicOS CLI.
admin@MSH8920:H1\$ sudo reboot	Reboot the switch to apply the modification.
Xorplus login: admin Password: admin	Validate the interfaces, connect back to the switch.
admin@MSH8920:H1\$ cli	
admin@Xorplus> show interface brief	Show the current interfaces configuration. It must show xe-1/1/1.1 to xe-1/1/1.4 and xe-1/1/3.1 to xe-1/1/3.4

3.2.1.3. Configure Switch Management IP Source (DHCP or Static), Address and VLAN

Configure the switch management IP source, address and VLAN. Choose Option 1 for a static IP and Option 2 for a DHCP IP.

Option1 – Static IP

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@XorPlus# delete interface gigabit-ethernet xe-1/1/49 family ethernet-switching native-vlan-id	Configure Management interface to use VLAN 1.
admin@XorPlus# set system management-ethernet eth1 ip-address IPv4 192.168.101.10/24	Configure Management interface to use static IP.
admin@XorPlus# commit	Save the configurations.

Option 2 – DHCP IP

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@XorPlus# delete interface gigabit-ethernet xe-1/1/49 family ethernet-switching native-vlan-id	Configure Management interface to use VLAN 1.
admin@Xorplus# set system management-ethernet eth1 ip-address IPv4 dhcp	Configure Management interface to use DHCP.
admin@XorPlus# commit	Save the configurations.

3.2.1.4. Configure ShMC Ports

Configure the Shelf Management Controller (ShMC) ports to enable communication with VLAN 1.

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@Xorplus# set interface gigabit-ethernet xe-1/1/1.1 family ethernet-switching port-mode trunk	Set the port in trunk mode.
admin@Xorplus# delete interface gigabit-ethernet xe-1/1/50 family ethernet-switching native-vlan-id	Configure SHMC interface to use VLAN 1.
admin@Xorplus# delete interface gigabit-ethernet xe-1/1/51 family ethernet-switching native-vlan-id	Configure Switch Controller interface to use VLAN 1.
admin@XorPlus# commit	Save the configurations.
admin@XorPlus# exit	Exit the configuration mode.
admin@Xorplus>	

3.2.2. Switch #2 Configuration steps

3.2.2.1. Log In the Switch CLI

Log in using the default credentials—user: admin and password: admin.

Command	Purpose
admin@Xorplus> Ctrl+g _	Use HOTKEY to redirect serial console multiplexer to the switch CLI of the second switch (H2).
Xorplus login: User: admin Password: admin	Enter switch credentials
admin@MSH8920:H2\$ cli admin@Xorplus>	Enter to the switch CLI mode.

The "Ctrl+g _" command is performed by pressing the Ctrl and g keys simultaneously, then entering the underscore character key followed by the Enter key.

3.2.2.2. Change Portmap configuration (Optional)

Portmap Name	Front I/O Bandwidth	Backplane "Fabric" Bandwidth
3x100G_QSFP	QSFP 1-3 @ 100G	Slots 3,6,9 @ 2x10Gb Slots 1-2,4-5,7-8 @ 4x10Gb
9x40G_FABRIC (Default configuration)	QSFP 1,3 @ 100G QSFP 2 @ 40Gb	Slots 1-9 @ 4x10G

Two choices available, 3x 100GbE QSFP or 9x 40GbE FABRIC (default configuration)

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@Xorplus# set interface portmap 3x100G_QSFP	Choose which portmap is needed, then execute the command. (3x100G_QSFP or the default 9x40G_FABRIC)
admin@XorPlus# commit	Commit change
admin@Xorplus# exit	Exit the configuration mode.
admin@Xorplus> exit	Exit the switch CLI.
admin@MSH8920:H2 sudo reboot	Reboot the switch to apply the modification.
Xorplus login: admin	Validate the interfaces, connect back to the switch.
Password: admin	
admin@MSH8920:H2 cli	
admin@Xorplus> show interface brief	Show the current interfaces configuration.

3.2.2.3. Change Uplink to 4x 25GbE per 100GbE port (Optional)

By default, ports 1 and 3 have a speed of 100Gbps. To connect the platform to a switch with a speed of 25Gbps and use QSFP to 4x SFP+ transceivers, force uplink port to a breakout mode. *The breakout must be done on each individual 100GbE port.*

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@Xorplus# set interface gigabit-ethernet xe-1/1/1.1 breakout 25g-4x	Specify the interface to be configured. Interface xe-1/1/1.1 1 is used as our main uplink. All 100Gb ports need to be configured to the same "breakout" mode.
admin@Xorplus# set interface gigabit-ethernet xe-1/1/3.1 breakout 25g-4x	Do the same for the port 3 if required.
admin@Xorplus# commit	Commit the configuration.
admin@Xorplus# exit	Exit the configuration mode.
admin@Xorplus> exit	Exit the PicOS CLI.
admin@MSH8920:H2 sudo reboot	Reboot the switch to apply the modification.
Xorplus login: admin	Validate the interfaces, connect back to the switch.
Password: admin	
admin@MSH8920:H1\$ cli	
admin@Xorplus> show interface brief	Show the current interfaces configuration. It must show xe-1/1/1.1 to xe-1/1/1.4 and xe-1/1/3.1 to xe-1/1/3.4

3.2.2.4. Configure Switch Management IP Source (DHCP or Static), Address and VLAN

Configure the switch management IP source, address and VLAN. Choose Option 1 for a static IP and Option 2 for a DHCP IP.

Option1 – Static IP

Command	Purpose
admin@Xorplus> configure	From privileged EXEC mode, enter global configuration mode.
admin@XorPlus# delete interface gigabit-ethernet	Configure Management interface to use VLAN

<pre>xe-1/1/49 family ethernet-switching native-vlan-id admin@XorPlus# set system management-ethernet eth1 ip-address IPv4 192.168.101.11/24 admin@XorPlus# commit</pre>	<p>1.</p> <p>Configure Management interface to use static IP.</p> <p>Save the configurations.</p>
--	---

Option 2 – DHCP IP

Command	Purpose
<pre>admin@Xorplus> configure</pre>	From privileged EXEC mode, enter global configuration mode.
<pre>admin@XorPlus# delete interface gigabit-ethernet xe-1/1/49 family ethernet-switching native-vlan-id</pre>	Configure Management interface to use VLAN 1.
<pre>admin@Xorplus# set system management-ethernet eth1 ip-address IPv4 dhcp</pre>	Configure Management interface to use DHCP.
<pre>admin@XorPlus# commit</pre>	Save the configurations.

3.2.2.5. Configure ShMC Ports

Configure the Shelf Management Controller (ShMC) ports to enable communication with VLAN 1.

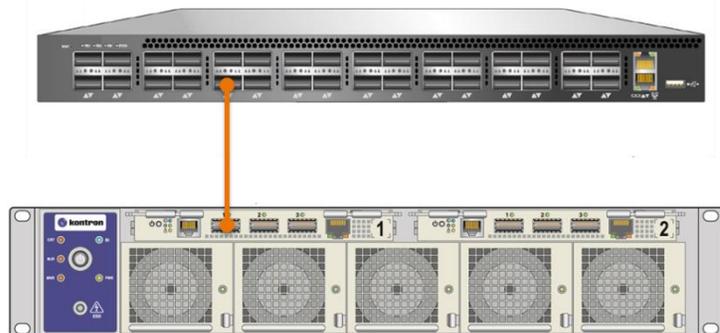
Command	Purpose
<pre>admin@Xorplus> configure</pre>	From privileged EXEC mode, enter global configuration mode.
<pre>admin@Xorplus# set interface gigabit-ethernet xe-1/1/1.1 family ethernet-switching port-mode trunk</pre>	Set the port in trunk mode.
<pre>admin@Xorplus# delete interface gigabit-ethernet xe-1/1/50 family ethernet-switching native-vlan-id</pre>	Configure SHMC interface to use VLAN 1.
<pre>admin@Xorplus# delete interface gigabit-ethernet xe-1/1/51 family ethernet-switching native-vlan-id</pre>	Configure Switch Controller interface to use VLAN 1.
<pre>admin@XorPlus# commit</pre>	Save the configurations.
<pre>admin@XorPlus# exit</pre>	Exit the configuration mode.
<pre>admin@Xorplus></pre>	

3.2.3. Connect the MS2920 Platform to the Network

NOTICE

The ShMCs and BMCs are preconfigured with addresses within the 192.168.101.xxx range. If your network uses that specific range, plugging in the system could cause some IP address conflicts with undesired side effects. If this is the case, complete the steps in Section 4/ Management Configuration before plugging in the cable as described in Section 3.2.3 and performing the verification steps (Sections 3.2.4 and 3.2.9) of Section 3/ Switch Configuration.

Connect your network to QSFP+ port 1 (see item 2 on Figure 2).



3.2.4. Verify Management IP Details and VLANs of Switch #2

Verify various management IP details such as those for DHCP addresses and VLANs. Note that it may take several seconds to obtain an IP from your DHCP server.

Command	Purpose
<pre>admin@Xorplus> show interface management-ethernet eth0 Hwaddr: 00:a0:a5:b9:22:6a State: DOWN Inet addr: Traffic statistics Input Packets.....0 Input Bytes.....0 Output Packets.....0 Output Bytes.....0 eth1 Hwaddr: 00:a0:a5:b9:22:6b State: UP Inet addr: 192.168.101.11/24 fe80::2a0:a5ff:feb9:226b/64 Traffic statistics Input Packets.....6093 Input Bytes.....657363 Output Packets.....875 Output Bytes.....262428</pre>	<p>Display configuration settings associated with the switch's network management interface (eth1).</p>

3.2.5. Verify Management IP Details and VLANs of Switch #1

Verify various management IP details such as those for DHCP addresses and VLANs. Note that it may take several seconds to obtain an IP from your DHCP server.

Command	Purpose
<pre>admin@Xorplus> show interface management-ethernet eth0 Hwaddr: 00:a0:a5:b9:22:6a State: DOWN Inet addr: Traffic statistics Input Packets.....0 Input Bytes.....0 Output Packets.....0 Output Bytes.....0 eth1 Hwaddr: 00:a0:a5:b9:22:6b State: UP Inet addr: 192.168.101.11/24 fe80::2a0:a5ff:feb9:226b/64 Traffic statistics Input Packets.....6093 Input Bytes.....657363 Output Packets.....875 Output Bytes.....262428</pre>	<p>Display configuration settings associated with the switch's network management interface (eth1).</p>

3.2.6. Confirm Proper Networking Configuration

Confirm the validity of the networking configuration by testing network connectivity to the external network via the management IP of the ToR switch.

Command	Purpose
<pre>admin@Xorplus> ping 192.168.101.254 PING 192.168.101.254 (192.168.101.254) 56(84) bytes of data. 64 bytes from 192.168.101.254: icmp_seq=1 ttl=64 time=1.80 ms 64 bytes from 192.168.101.254: icmp_seq=2 ttl=64 time=0.950 ms 64 bytes from 192.168.101.254: icmp_seq=3 ttl=64 time=1.27 ms 64 bytes from 192.168.101.254: icmp_seq=4 ttl=64 time=1.02 ms 64 bytes from 192.168.101.254: icmp_seq=5 ttl=64 time=1.19 ms --- 192.168.101.254 ping statistics --- 5 packets transmitted, 5 received, 0% packet loss, time 4005ms rtt min/avg/max/mdev = 0.950/1.250/1.802/0.300 ms</pre>	<p>Ping external network using the management IP of the ToR switch.</p>

3.3. Paste Multiple Commands for MSH8920 Switch Configuration

NOTICE

Do not perform this step if you have done all the configurations required in Section 3.2. Section 3.3 describes an option to perform all the steps described in Section 3.2 by pasting multiple commands at once.

3.3.1. Log In the Switch #1 CLI

Log in using the default credentials—user: admin and password: admin.

Command	Purpose
<pre>kci-msh8920 login: Ctrl+g - Xorplus login: User: admin Password: admin admin@MSH8920:H1\$ cli</pre>	<p>Use HOTKEY to redirect serial console multiplexer to the switch CLI.</p> <p>Enable the console mode.</p>

The "Ctrl+g -" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on the Minus key followed by the Enter key.

3.3.2. Paste the Configuration Commands – switch #1

When multiple platforms must be configured, several commands can be pasted into the console as a block to save time. The commands shown below form a typical command list for a static IP and VLAN 1. Adapt this list based on your network requirements.

Command	Purpose
<pre>admin@Xorplus> configure delete interface gigabit-ethernet xe-1/1/49 family ethernet-switching native-vlan-id set system management-ethernet eth1 ip- address IPv4 192.168.101.10/24 set interface gigabit-ethernet xe-1/1/1.1 family ethernet-switching port-mode trunk delete interface gigabit-ethernet xe-1/1/50 family ethernet-switching native-vlan-id delete interface gigabit-ethernet xe-1/1/51 family ethernet-switching native-vlan-id commit exit</pre>	<p>From privileged EXEC mode, enter global configuration mode. Configure Management interface to use VLAN 1.</p> <p>Configure Management interface to use static IP.</p> <p>Set the port in trunk mode.</p> <p>Configure SHMC interface to use VLAN 1.</p> <p>Configure Switch Controller interface to use VLAN 1.</p> <p>Save the configuration.</p> <p>Exit the configuration mode.</p>

3.3.3. Confirm Configurations

Once this is done, manually confirm that each configuration was applied properly.

Command	Purpose
<pre>admin@Xorplus> show running-config admin@Xorplus> show ethernet-switching interfaces admin@Xorplus> show interface management- ethernet admin@Xorplus> show interface brief</pre>	<p>Display the current configuration.</p> <p>Display the interfaces with VLANs.</p> <p>Show the management IP address.</p> <p>Show all interfaces.</p>

3.3.4. Log In the Switch #2 CLI

Log in using the default credentials—user: admin and password: admin.

Command	Purpose
<pre>admin@Xorplus> Ctrl+g _ Xorplus login: User: admin Password: admin admin@MSH8920:H2\$ cli admin@Xorplus></pre>	<p>Use HOTKEY to redirect serial console multiplexer to the switch CLI of the first switch (H2).</p> <p>Enter switch credentials</p> <p>Enter to the switch CLI mode.</p>

The "Ctrl+g _" command is performed by pressing the Ctrl and g keys simultaneously, then entering the underscore character key followed by the Enter key.

3.3.5. Paste the Configuration Commands – switch #2

When multiple platforms must be configured, several commands can be pasted into the console as a block to save time. The commands shown below form a typical command list for a static IP and VLAN 1. Adapt this list based on your network requirements.

Command	Purpose
<code>admin@Xorplus> configure</code>	From privileged EXEC mode, enter global configuration mode.
<code>delete interface gigabit-ethernet xe-1/1/49</code> <code>family ethernet-switching native-vlan-id</code>	Configure Management interface to use VLAN 1.
<code>set system management-ethernet eth1 ip-address IPv4 192.168.101.11/24</code>	Configure Management interface to use static IP.
<code>set interface gigabit-ethernet xe-1/1/1.1</code> <code>family ethernet-switching port-mode trunk</code>	Set the port in trunk mode.
<code>delete interface gigabit-ethernet xe-1/1/50</code> <code>family ethernet-switching native-vlan-id</code>	Configure SHMC interface to use VLAN 1.
<code>delete interface gigabit-ethernet xe-1/1/51</code> <code>family ethernet-switching native-vlan-id</code>	Configure Switch Controller interface to use VLAN 1.
<code>commit</code>	Save the configuration.
<code>exit</code>	Exit the configuration mode.

3.3.6. Confirm Configurations

Once this is done, manually confirm that each configuration was applied properly.

Command	Purpose
<code>admin@Xorplus> show running-config</code>	Display the current configuration.
<code>admin@Xorplus> show ethernet-switching interfaces</code>	Display the interfaces with VLANs.
<code>admin@Xorplus> show interface management-ethernet</code>	Show the management IP address.
<code>admin@Xorplus> show interface brief</code>	Show all interfaces.

You have now completed section Switch Configuration.

You should now have configured your switch and should have access to the switch management interface of the MS2920 platform switches using the IP provided in Section 3.2.2 and Section 3.2.5.

You can now proceed to section Management Configuration.



4/ Management Configuration



4.1. Introduction

By completing the steps described in this section, you will set up the management IP addresses, i.e. the addresses required to access the platform management features.

After completing this stage, you will be able to access the following interfaces:

1. System Manager RESTFUL API interface
2. System Manager web interface
3. ShMCs and BMCs IPMI Over LAN interface (IOL) and Serial Over LAN (SOL) interface

These interfaces (or any combination thereof) can be used to manage the MS2920 platform, perform firmware upgrades, monitor system health and configure the platform more in depth.

4.1.1. Management Architecture Overview

Each individual modular server processing node (MSP node) has a network connection to each switch. Both switches are stacked together (acting as a single switch) for redundancy purposes.

Figure 5: MS2920 management interconnections

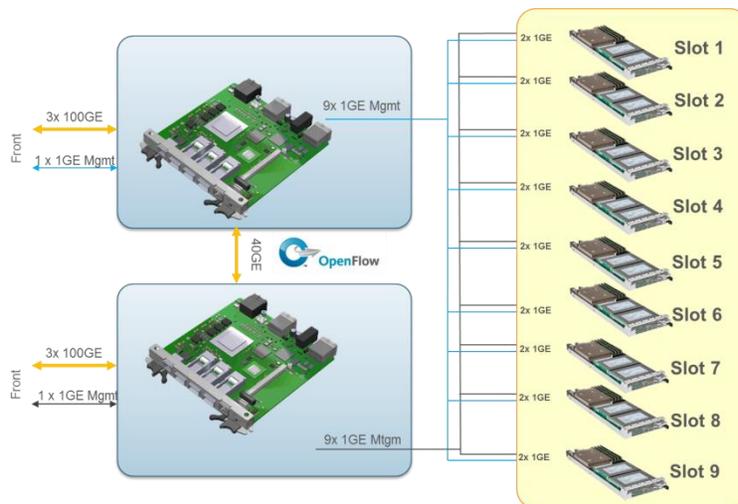
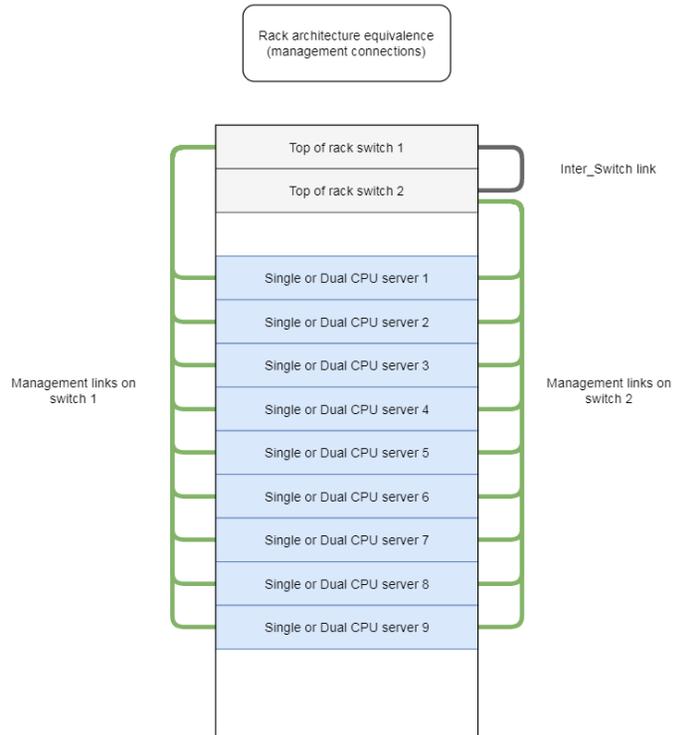


Figure 6: Rack architecture equivalence



4.2. Configure the IP Address of the Active ShMC

NOTICE

Once you have fully understood the steps described in Sections 4.2, 4.3 and 4.4, you could paste multiple configuration commands all at once into the CLI to perform them all in one step. If you wish to proceed this way, refer to the instructions provided in Section 4.5 and adapt the command list examples provided based on your network requirements.

4.2.1. Set Up the Access to the Active ShMC

Access the active ShMC CLI via the muxed serial connection.

Command	Purpose
<pre>admin@MSH8920:H1\$ Ctrl+g 0 Kontron SHMC Distro ttyS1 kci-msh8920 login: admin Password: admin ipmitool></pre>	<p>Use HOTKEY to redirect serial console multiplexer to the ShMC CLI.</p>

The "Ctrl+g 0" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on the 0 key followed by the Enter key.

4.2.2. Remove the VLAN ID

Remove the VLAN ID of the management interface to create a single network path for the management and payload network.

Command	Purpose
<code>ipmitool> lan set 1 vlan id off</code>	Disable VLAN on the ShMC.

4.2.3. Configure and Set the IP Address (Static or DHCP)

Configure and set the IP address, the netmask and the gateway (optional for a static IP). Choose Option 1 for a static IP or Option 2 for a DHCP IP.

Option 1 – Static IP

Command	Purpose
<code>ipmitool> lan set 1 ipsrc static</code>	Configure IP source to static.
<code>ipmitool> lan set 1 ipaddr 192.168.101.1</code>	Define static IP address.
<code>ipmitool> lan set 1 netmask 255.255.255.0</code>	Define netmask.
<code>ipmitool> lan set 1 defgw ipaddr 192.168.101.254</code>	Define default gateway IP address.

Option 2 – DHCP IP

Command	Purpose
<code>ipmitool> lan set 1 ipsrc dhcp</code>	Configure IP source to DHCP.

Note that it may take several seconds to gather an IP from the DHCP server.

4.2.4. Verify Active ShMC Network Configuration

Check the following configurations: IP address source (Static or DHCP), IP address, subnet mask, default gateway IP and 802.1q VLAN ID. It may take several seconds to gather an IP from the DHCP server. The results shown in the table below are for a static IP with VLAN ID disabled.

Command	Purpose
<code>ipmitool> lan print</code> Access Mode : Enable IP Address Source : Static IP Address : 192.168.101.1 Subnet Mask : 255.255.255.0 MAC Address : 00:a0:a5:96:e9:ea IP Header : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10 Default Gateway IP : 192.168.101.254 Default Gateway MAC : 00:00:00:00:00:00 802.1q VLAN ID : Disabled 802.1q VLAN Priority : 0 HPM.2 Draft Capabilities: Supported Hostname (OEM) :	Display the current network configuration.

4.3. Configure the IP Address of the Standby ShMC

4.3.1. Set Up the Access to the Standby ShMC

There are 2 access methods available, based on preference. Once you have chosen a method and accessed the component, the commands to type are identical, regardless of your choice.

Option 1: Toggle the serial console connection to the Standby ShMC (see Figure 4).

Option 2: Stay in the serial console of the active ShMC, but change the target address of the commands (IPMI bridging).

Option 1: Set up the access by directing the serial connection to the standby ShMC

Command	Purpose
<pre>ipmitool> Ctrl+g) Kontron SHMC Distro ttyS1 kci-msh8920 login: admin Password: admin ipmitool></pre>	Use HOTKEY to redirect serial console multiplexer to the standby ShMC CLI.

The "Ctrl+g)" command is performed by pressing the Ctrl and g keys simultaneously, then entering the closing parentheses character followed by the Enter key.

Option 2: Set up the access by using IPMI bridging

Command	Purpose
<pre>ipmitool> set targetaddr 0x10</pre>	Set remote target address of the standby ShMC. The following command will be redirected to the targeted address.

This redirects all ipmitool shell commands to the standby ShMC until the end of the session (type Exit or press Ctrl+c) or a manual change to another component using their respective target address.

4.3.2. Remove the VLAN ID

Remove the VLAN ID of the management interface to create a single network path for the management and payload network.

Command	Purpose
<pre>ipmitool> lan set 1 vlan id off</pre>	Disable VLAN on the ShMC.

4.3.3. Configure and Set the IP Address (DHCP or Static)

Configure and set the IP address, the netmask and the gateway (optional for a static IP). Choose Option 1 for a static IP or Option 2 for a DHCP IP.

Option 1 – Static IP

Command	Purpose
<pre>ipmitool> lan set 1 ipsrc static ipmitool> lan set 1 ipaddr 192.168.101.2 ipmitool> lan set 1 netmask 255.255.255.0 ipmitool> lan set 1 defgw ipaddr 192.168.101.254</pre>	Configure IP source to static. Define static IP address. Define netmask. Define default gateway IP address.

Option 2 – DHCP IP

Command	Purpose
ipmitool> lan set 1 ipsrc dhcp	Configure IP source to DHCP.

Note that it may take several seconds to gather an IP from the DHCP server.

4.3.4. Verify Standby ShMC Network Configuration

Check the following configurations: IP address source (Static or DHCP), IP address, subnet mask, default gateway IP and 802.1q VLAN ID (disabled in the example below). The results shown in the table below are for a static IP with VLAN ID disabled.

Command	Purpose
<pre>ipmitool> lan print Access Mode : Enable IP Address Source : Static IP Address : 192.168.101.2 Subnet Mask : 255.255.255.0 MAC Address : 00:a0:a5:96:e9:ea IP Header : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10 Default Gateway IP : 192.168.101.254 Default Gateway MAC : 00:00:00:00:00:00 802.1q VLAN ID : Disabled 802.1q VLAN Priority : 0 HPM.2 Draft Capabilities: Supported Hostname (OEM) :</pre>	Display the current network configuration.

4.4. Configure the IP Address of the BMC on Each Modular Server Processing Node

All the steps in this section have to be done for each available MSP node in your platform (up to 9). It is advisable to note when an MSP node configuration is completed. If at any point while cycling through the list of MSP nodes in your system you are not sure to which component you are connected, just go back to the Set-Up step (Section 4.4.1) and redo it for the targeted MSP node.

4.4.1. Set Up the Access to the BMC on a Specific Modular Server Processing Node

As for the standby ShMC, there are 2 access methods available, based on preference. Once you have chosen a method and accessed the component, the commands to type are identical, regardless of your choice.

Option 1: Toggle the serial console connection to the desired BMC (see Figure 4).

Option 2: Stay in the serial console of the active ShMC, but change the target address of the commands (IPMI bridging).

Option 1 – Set up the access by directing the serial connection to the BMC (example provided for MSP node 1)

Command	Purpose
<pre>ipmitool> Ctrl+g 1 CentOS Linux 7 (Core) Kernel 3.10.0-229.el7.x86_64 on an x86_64 sk9013075860 login: Ctrl+gg 0 MSP803X login: admin Password: ipmitool></pre>	<p>Use HOTKEY to redirect serial console multiplexer to the MSP node 1 components.</p> <p>Use HOTKEY to redirect serial console multiplexer to the BMC of MSP node 1.</p>

The "Ctrl+g 1" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on 1 (the modular server processing node number) followed by the Enter key. This sets the serial multiplexer mechanism to the latest targeted component of the modular server processing node (for a modular server processing node with dual CPUs, the default redirection will be on payload 1).

If there is an OS installed on the MSP node, you should get something similar to the example above. Otherwise, the console may not show anything at this point.

The "Ctrl+gg 0" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on the g key again, followed by the 0 key and the Enter key. This will toggle the multiplexer to target the BMC instead of the payload (see Figure 4).

Option 2 – Set up the access by using IPMI bridging

Command	Purpose
<pre>ipmitool> set targetaddr 0x82</pre>	<p>Set remote target address to the BMC of MSP node 1. The following commands will be redirected to the targeted address.</p>

This command redirects the ipmi command to the BMC of MSP node 1 (see Figure 3 for the addresses of the other BMCs).

4.4.2. Remove the VLAN ID

Remove the VLAN ID of the management interface to create a single network path for the management and payload network.

Command	Purpose
<pre>ipmitool> lan set 1 vlan id off</pre>	<p>Disable VLAN on the ShMC.</p>

4.4.3. Configure and Set the IP Address (Static or DHCP)

Configure and set the IP address, the netmask and the gateway (optional for a static IP). Choose Option 1 for a static IP or Option 2 for a DHCP IP.

Option 1 – Static IP

Command	Purpose
<pre>ipmitool> lan set 1 ipsrc static ipmitool> lan set 1 ipaddr 192.168.101.11 ipmitool> lan set 1 netmask 255.255.255.0 ipmitool> lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Configure IP source to static.</p> <p>Define static IP address.</p> <p>Define netmask.</p> <p>Define default gateway IP address.</p>

Option 2 – Network using DHCP IP

Command	Purpose
ipmitool> lan set 1 ipsrc dhcp	Configure IP source to DHCP.

Note that it may take several seconds to gather an IP from the DHCP server.

4.4.4. Verify BMC Network Configuration

Check the following configurations: IP address source (Static or DHCP), IP address, subnet mask, default gateway IP and 802.1q VLAN ID. The results shown in the table below are for a static IP with VLAN ID disabled.

Command	Purpose
<pre>ipmitool> lan print Access Mode : Enable IP Address Source : Static IP Address : 192.168.101.11 Subnet Mask : 255.255.255.0 MAC Address : 00:a0:a5:90:ac:d0 IP Header : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10 Default Gateway IP : 192.168.101.254 Default Gateway MAC : 00:00:00:00:00:00 802.1q VLAN ID : Disabled 802.1q VLAN Priority : 0 HPM.2 Draft Capabilities: Supported Hostname (OEM) :</pre>	Display the current network configuration.

4.4.5. Configure the BMC of the Next Modular Server Processing Node

Configure the BMC of the next MSP node by going back to Section 4.4.1 and performing the required steps. You will have to perform this configuration sequence for all the MSP nodes in the platform.

NOTICE

If you have not physically connected the MS2910 platform to the network as described in Section 3.2.3 because of possible IP address conflicts, do so now. Also perform the switch configuration verification steps that were omitted (Sections 3.2.4 and 3.2.6).

4.5. Paste Multiple Commands in the Console to Perform Management Configuration

NOTICE

Do not perform this step for a platform if you have done all the configurations required in Sections 4.2, 4.3 and 4.4. Section 4.5 describes an option to perform all the steps described in Section 4.2, 4.3 and 4.4 by pasting multiple commands at once.

4.5.1. Set Up the Access to the Active ShMC

Access the active ShMC CLI via the muxed serial connection.

Command	Purpose
<pre>ipmitool>Ctrl+g 0 kci-msh8920 login: admin Password: admin ipmitool></pre>	Use HOTKEY to redirect serial console multiplexer to the ShMC CLI.

The "Ctrl+g 0" command is performed by pressing the Ctrl and g keys simultaneously, then pressing on the 0 key followed by the Enter key.

4.5.2. Paste the Configuration Commands

When multiple platforms must be configured, several commands can be pasted into the console as a block to save time. Two command lists are provided below. They are typical command lists for static IP and DHCP IP. Choose Option 1 for a static IP or Option 2 for a DHCP IP. Adapt these commands based on your network requirements.

Option 1 – Set both ShMCs and all BMCs to a static IP and disable VLAN ID

Command	Purpose
<pre>ipmitool> # set targetaddr 0x20 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.1 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target active ShMC IPMI address. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x10 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.2 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target standby ShMC IPMI address. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x82 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.11 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 1. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x84 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.12 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 2. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x86 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.13 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 3. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x88 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.14 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 4. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x8a lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.15 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 5. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x8c lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.16 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 6. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x8e lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.17 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 7. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>

Command	Purpose
<pre>set targetaddr 0x90 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.18 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 8. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x92 lan set 1 ipsrc static lan set 1 vlan id off lan set 1 ipaddr 192.168.101.19 lan set 1 netmask 255.255.255.0 lan set 1 defgw ipaddr 192.168.101.254</pre>	<p>Target BMC of MSP node 9. Configure IP source to static. Disable VLAN. Define static IP address. Define netmask. Define default gateway IP address.</p>
<pre>set targetaddr 0x20</pre>	<p>Target active ShMC IPMI address.</p>

Option 2 – Set both ShMCs and all BMCs to use a DHCP IP and disable VLAN ID

Command	Purpose
<pre>ipmitool> # set targetaddr 0x20 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target active ShMC IPMI address. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x10 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target standby ShMC IPMI address. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x82 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 1. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x84 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 2. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x86 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 3. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x88 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 4. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x8a lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 5. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x8c lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 6. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x8e lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 7. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x90 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 8. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x92 lan set 1 vlan id off lan set 1 ipsrc dhcp</pre>	<p>Target BMC of MSP node 9. Disable VLAN. Configure IP source to DHCP.</p>
<pre>set targetaddr 0x20</pre>	<p>Target active ShMC IPMI address.</p>

4.5.3. Confirm Configurations

Once this is done, manually confirm that each configuration was applied properly.

Command	Purpose
<code>ipmitool> # set targetaddr 0x20 lan print</code>	Confirm configuration of the active ShMC.
<code>set targetaddr 0x10 lan print</code>	Confirm configuration of the standby ShMC.
<code>set targetaddr 0x82 lan print</code>	Confirm configuration of the BMC of MSP node 1.
<code>set targetaddr 0x84 lan print</code>	Confirm configuration of the BMC of MSP node 2.
<code>set targetaddr 0x86 lan print</code>	Confirm configuration of the BMC of MSP node 3.
<code>set targetaddr 0x88 lan print</code>	Confirm configuration of the BMC of MSP node 4.
<code>set targetaddr 0x8a lan print</code>	Confirm configuration of the BMC of MSP node 5.
<code>set targetaddr 0x8c lan print</code>	Confirm configuration of the BMC of MSP node 6.
<code>set targetaddr 0x8e lan print</code>	Confirm configuration of the BMC of MSP node 7.
<code>set targetaddr 0x90 lan print</code>	Confirm configuration of the BMC of MSP node 8.
<code>set targetaddr 0x92 lan print</code>	Confirm configuration of the BMC of MSP node 9.
<code>set targetaddr 0x20</code>	Redirect bridging to the active ShMC.

You have now completed section Management Configuration.

You should now be able to start managing your platform and have access to the System Monitor web interface using the IP configured at step 4.2.

To properly and fully complete the configuration, please refer to the platform documentation at kontron.com.





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