

"How To" - MS2920 - MS Series Deployment Tools



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1. Symbols

Info

This symbol is used to indicate:

- general information about the product and user manual
- details about the specific product configuration

Notice

NOTICE indicates an important message. Undesired operation may occur if it is ignored.

Warning

WARNING indicates a very important message. The process may fail if it is ignored.

Tip

TIP indicates a message containing helpful hints and tips.

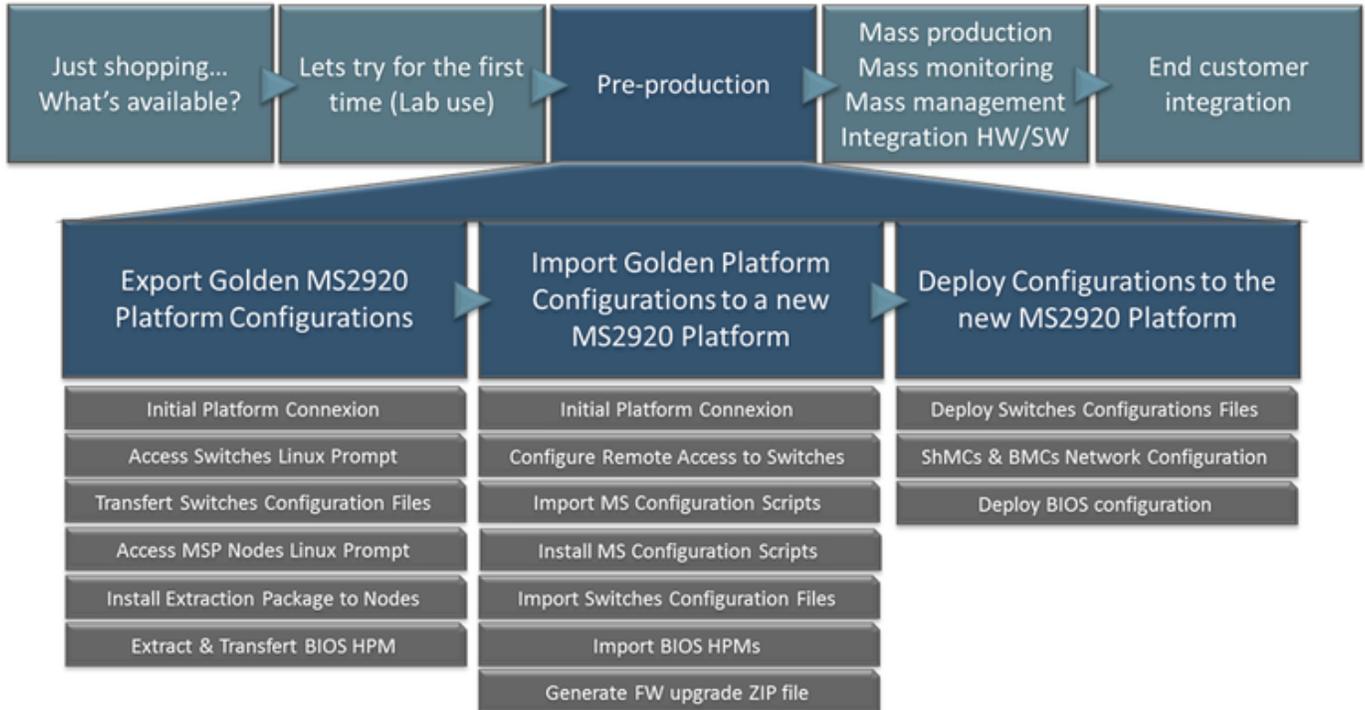
2. Introduction

This document describes the steps required to export the configuration files from a golden MS2920 platform and apply those configurations to a new MS2920 platform.

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 document contains an introduction with general information, followed by steps to perform platform configuration. The sections covered are as shown on the flow diagram below.



Info

Once the steps described in this document are completed you would be able to start the mass deployment of the Operating Systems.

3. Export 'Golden' MS2920 Platform Configurations



3.1. Prerequisites and Platform Requirements

Information in this section assumes that the following requirements are met.

3.1.1. MSH8920

- The NOS(PicOS) version running on the reference switch should be the same as is running on target platforms on which the configuration will be imported.

Notice

A PicOS version mismatch between the golden config-file and a target MSH8920 may cause undesired operation, due to the absence of required configuration elements.

- Switch configuration on MSH8920 has already been performed and is ready to be exported
- Switch command-prompt is remotely accessible over SSH

Tip

To enable SSH access to the NOS via serial port, refer to the "Import 'Golden' Platform Configuration to an MS2920 Platform > Initial Platform Connection" section below.

Tip

For more information on how to perform (switch) NOS upgrade, refer to the MSH8920 Series User Guide, as required.

For more information on how to build a reference switch configuration, refer to the MSH8920 Series User Guide, as required.

3.1.2. MSP8040- and MSP8060-series Nodes

- The currently running BIOS version is the following depending on the model:
 - MSP8040: 1.14.09216DD2
 - MSP8060: 1.05.0921ED8B

Notice

Because the ME firmware region of the SPI Flash is locked and cannot be read, the HPM-generator tool will verify that the currently running BIOS version matches the version of the reference BIOS binary; an error will be raised in the event of a version mis-match.

Notice

BIOS upgrade may interfere with UEFI settings. As a result, an already installed Operating System may fail to boot following an upgrade. It is recommended to perform BIOS upgrade prior to installing the Operating System.

- BIOS configuration has already been performed and is ready to be exported

Notice

If the boot device population differs between source board and target board, the boot order configuration may not be the intended one

- A Linux-based OS is already installed on nodes where export will be performed, including IPMI support
- The server from which the export will be performed is accessible over SSH

Tip

For more information on how to perform firmware upgrades on Symkloud MSP-Nodes, refer to the Symkloud-MS System Monitor User Guide, as required.

For an example of how to install an Operating System on a Symkloud MSP-Node's server, refer to Installing Ubuntu Server on MSP8040 Guide or Installing Ubuntu Server on MSP8060 Guide, as required.

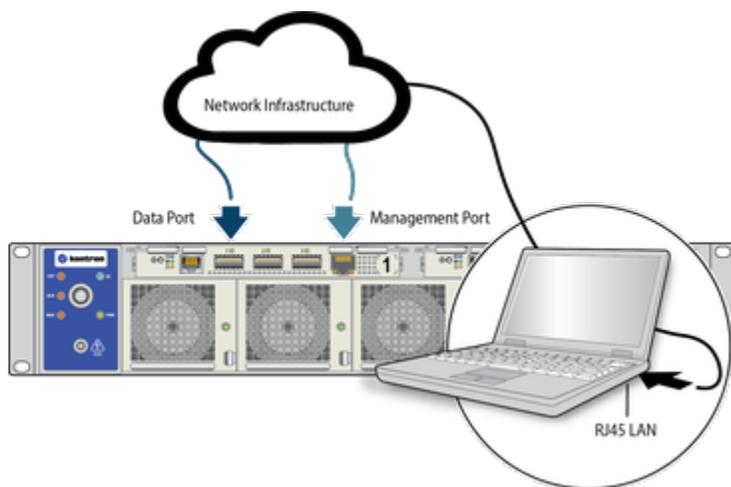
3.1.3. Remote Computer

- The remote computer can remotely access the MS2920 platform components over SSH, using the following tools:
 - An SSH client (Usually built-in on Linux hosts; A Windows host can use a free and open-source client such as PuTTY)
 - An SCP client (Usually built-in on Linux hosts; A Windows host can use a free and open-source client such as WinSCP)

3.2. Initial Platform Connection

Notice

The diagram included below is provided for illustrative purposes only. Platform access may need to be adapted based on the specific network infrastructure being used.



3.3. Export Switch Configuration File(s)

This section describes the steps required to generate and export a switch configuration file for the MSH8920, which can then be used to replicate the configuration to other MS2920 platforms.

3.3.1. Overview

The MSH8920 NOS allows saving the switch configuration to, and loading it from, a text file containing JSON objects. A reference configuration prepared on a switch can thus be saved and applied to other switches, effectively replicating the complete reference configuration in a few steps.

3.3.2. Access the Reference-switch's NOS (Linux-prompt)

Establish an SSH session from the remote computer to the reference-switch.

Command	Purpose
RemoteComputer\$ ssh admin@<Switch_IP_Address>	Start SSH session to switch
admin@<Switch_IP_Address>'s password: admin	Enter switch password for admin user
admin@MSH8920:H1\$	

3.3.3. Invoke CLI and Enter Configuration Mode

Once the SSH session is established and login has been completed, the following commands are run as part of the SSH session.

Command	Purpose
admin@MSH8920:H1\$ cli Synchronizing configuration...OK. Pica8 PICOS Version 2.9.3.9 Welcome to PICOS on Xorplus admin@Xorplus> configure	Invoke PicOS Command Line Interface
Entering configuration mode. There are no other users in configuration mode. admin@Xorplus#	Enter Configuration Mode

3.3.4. Export Switch Configuration files

While in configuration mode (#) of the NOS (PicOS) CLI, save the running configuration to a file, then exit to the Linux-prompt.

Command	Purpose
admin@Xorplus# save <ConfigFileName> Save done.	Saves running switch configuration to a file.
admin@Xorplus# exit admin@Xorplus> exit admin@MSH8920:H1\$	Exit from configuration mode, then from CLI to Linux-prompt.

The file (whose name was specified above) can be found at /pica/config/admin/<ConfigFileName> and should be copied back to the remote computer for subsequent deployment steps.

As an example, the file can be retrieved from the remote computer using scp:

Command	Purpose
RemoteComputer\$ scp admin@<Switch_IP_Address>:/pica/config/admin/<configFileName> /path/to/file	Remotely retrieves configuration file using secure copy over SSH.

Notice

If a different configuration is required for the second switch, all the steps in this section should be repeated on the second reference-switch.

Be sure to use distinct filenames in order to know which file should be imported to each switch when deploying.

3.4. Build Pre-configured BIOS-only HPM File(s)

This section describes the steps required to generate and export an HPM file, containing only a pre-configured BIOS image, for either MSP8040- or MSP8060-series MSP-Nodes.

3.4.1. Overview

The BIOS flash for each server on a SymKloud MSP-Node is split in two distinct parts: The first half includes the firmware and configuration of the Intel Management Engine (part of the PCH), and the second half contains the BIOS along with its configuration.

The script run in this section extracts the second half of the binary and creates a new BIOS image using the corresponding reference BIOS. The resulting binary is then packaged as an HPM file, that will be subsequently used for deployment to other MSP-Nodes of the same model.

Info

When upgrading an MSP8060 via OneClick or HPM, the same BIOS (pre-configured or default, depending on the HPM/bundle used) will be applied to both servers.

3.4.2. Access the Reference-server's Linux-prompt

Establish an SSH session to the reference-server from the remote computer.

Command	Purpose
RemoteComputer\$ ssh <user>@<Ref_Server_IP_Address>	Initiate the SSH session to the reference-server

3.4.3. Import and uncompress BIOS Extraction Package

The `extract_bios_cfg_X.X.tar.gz` package must be transferred to the reference-server. As an example, the package can be copied to the node by running the following `scp` command on the remote computer:

Command	Purpose
RemoteComputer\$ scp /path/to/extract_bios_cfg_X.X.tar.gz <user>@<Ref_Server_IP_Address>:/tmp	Remotely copies package to target reference-server

Next, uncompress the package:

Command	Purpose
\$ cd /tmp \$ tar xzf extract_bios_cfg_X.X.tar.gz	Uncompress/extract the BIOS tools package

3.4.4. Generate pre-configured BIOS HPM file

Info

Make sure the IPMI device `"/dev/ipmi0"` is present. If it is not the case, install and load the required modules (as root).

```
$ sudo apt-get install openipmi
$ sudo modprobe ipmi_si
$ sudo modprobe ipmi_devintf
```

Run the `extract_bios_cfg.sh` script as root (or using 'sudo'); various underlying support tools require hardware access.

Command	Purpose
<pre>\$ cd extract_bios_cfg \$ sudo ./extract_bios_cfg.sh</pre>	Execute BIOS extraction script

Notice

At this point, the script will attempt to auto-detect the MSP-Node model of the reference-server using IPMI commands. If the reference MSP-Node model cannot be determined, the script will abort; It is deliberately not possible to manually specify the reference MSP-Node model in order to prevent creating an invalid BIOS binary.

Notice

Next, the script will perform a version check on the running BIOS version, also using IPMI commands; A match on Major, Minor and Auxiliary revision bytes is required to proceed. A mismatch will result in a warning that must be manually acknowledged before continuing; choosing to proceed at that point will result in an unknown ME Firmware / BIOS combination and is neither recommended, nor supported.

The script will read the BIOS region from the SPI Flash and repackage a new BIOS binary using retrieved BIOS data along with the ME firmware from the (included) reference BIOS binary for the specific MSP-Node model. The recombined binary will then be packaged as a .hpm file with the name below, according to the reference MSP-Node model:

- MSP8040: BIOS_MSP8040_CFG_1.14.09216DD2.hpm
- MSP8060: BIOS_MSP8060_CFG_1.05.0921ED8B.hpm

If any errors are encountered, the file `output.log` will contain output from underlying tools for that are used and may help identify problems.

3.4.5. Export pre-configured BIOS HPM File

Once the script has run successfully, the resulting .hpm file can be retrieved by the remote computer using `scp`:

Command	Purpose
<pre>RemoteComputer\$ scp <user>@<Ref_Server_IP_Address>:/tm p/<hpmFile> /path/to/target</pre>	Remotely retrieves the custom BIOS-only HPM using secure copy over SSH

Store the new HPM file in an appropriate location for use in later sections.

This concludes the 'Build Pre-configured BIOS-only HPM File(s)' section.

The preceding sections should have created:

- One (or two) Switch configuration files, depending on if a different configuration is applied to each switch
- One (or both) of:
 - A pre-configured BIOS-only HPM file for the MSP8040
 - A pre-configured BIOS-only HPM file for the MSP8060

Proceed with section "Import 'Golden' Platform Configuration to an MS2920 Platform".

4. Import 'Golden' Platform Configuration to an MS2920 Platform



4.1. Prerequisites and Platform Requirements

Information in this section assumes that the following requirements are met:

4.1.1. MS2920 platform

All components in the MS2920 platform should be updated to the appropriate (respective) firmware versions. This tool and document assumes the following firmware versions are used:

- MSH8920:
 - ShMC 1.09.0121ED17
 - FPGA 1.03.0800BDD5
 - Switch 1.6.4-24 (PicOS 2.9.3.9)
- MSP8040:
 - BMC 1.13.09223DD2
 - FPGA 2.02.00000000
 - BIOS 1.14.09216DD2
- MSP8060:
 - BMC 1.04.01225C16
 - FPGA 1.0.08003B50
 - BIOS 1.05.0921ED8B

Notice

BIOS upgrade may interfere with UEFI settings. As a result, an already installed Operating System may fail to boot following upgrade.

It is recommended to perform BIOS upgrade prior to installing the Operating System.

Tip

For more information on how to perform switch NOS upgrade, refer to the MSH8920 Series User Guide, as required.

For more information on how to perform firmware upgrades on SymKloud MSP-Nodes, refer to the SymKloud-MS System Monitor User Guide, as required.

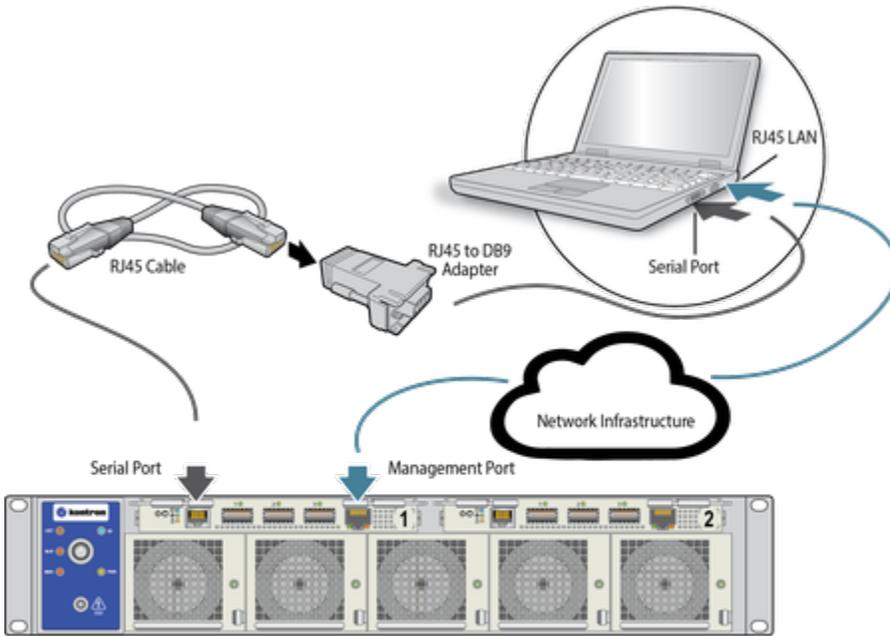
4.1.2. Remote computer

- The remote computer can access the MS2920 over serial port, using a terminal emulation software such as minicom or PuTTY.
- The remote computer can remotely access the MS2920 platform components (NOS and ShMC/BMCs) over SSH, using the following tools:
 - An SSH client (Usually built-in on Linux hosts; A Windows host can use a free and open-source client such as PuTTY)
 - An SCP client (Usually built-in on Linux hosts; A Windows host can use a free and open-source client such as WinSCP)

4.2. Initial Platform Connection

Notice

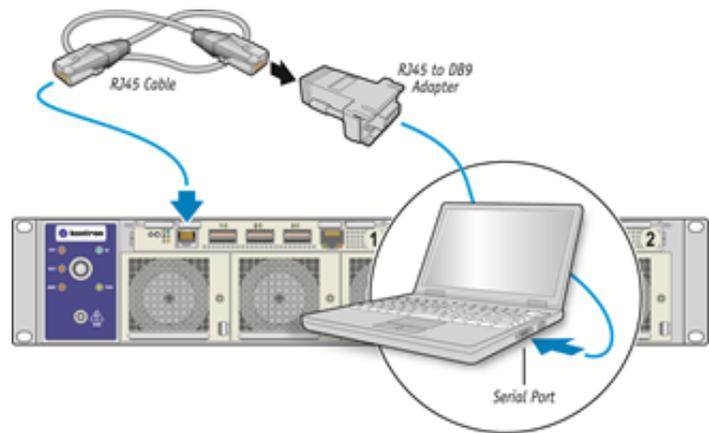
The diagram included below is provided for illustration purposes only. Platform access may need to be adapted based on the specific network infrastructure being used.



4.2.1. Serial Console: Connection and Configuration

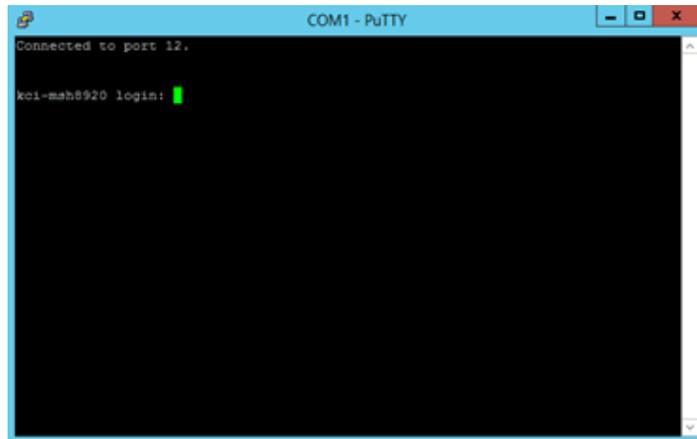
Use the RJ45 to DB9 adapter provided with the platform to connect a (non-crossover) Ethernet cable to establish a serial connection between the technician's PC and the MS2920.

Be sure to connect to the RJ45 console port (faceplate marking "10101") of the left-side MSH-HubNode (H1).



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

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



4.3. Initial Switch Remote-access Configuration

4.3.1. Overview

These are the initial steps required in order to be able to perform deployment steps on new systems; These instructions will setup the initial IP address on both switches, to allow transferring support files to subsequently apply the captured configuration to the platform.

4.3.2. Access Switch 1's NOS (Linux-prompt)

Login to the ShMC CLI console, using factory default password (admin/admin):

Command	Purpose
<pre>msh8920 login: admin Password: admin ipmitool></pre>	Access the ShMC's ipmitool> shell-prompt

Info

Procedure assumes the default MSH8920 console-prompt is displayed. If any other prompt is received, press Ctrl-g, '0' to return to the local ShMC.

Redirect serial console multiplexer to the local switch's serial console using this IPMI command :

Command	Purpose
<pre>ipmitool> raw 0x3e 0x62 0xB4 0x90 0x91 0x8B 0x9c 0x00 0x2d 0xff</pre>	Use IPMI command to redirect serial console multiplexer to the switch CLI of the local switch (H1).

Tip

This command is equivalent to using "Ctrl+g -" to redirect the serial port multiplexer.

The "Ctrl+g -" command is performed by pressing the Ctrl and g keys simultaneously (The ASCII control code for "Ctrl-g" is 7), then pressing on the Minus key, followed by the Enter key.

After the command is sent there will be no confirmation; Press [ENTER] to see the Switch (NOS) Login-prompt.

Note that it takes longer for the switch to boot than for the ShMC; there may be a delay before the NOS is ready for login, depending on how long it has been since the system was powered on.

Login to the switch's NOS console, using factory default password (admin/admin):

Command	Purpose
<pre>Debian GNU/Linux stretch/sid Xorplus ttyS0 Xorplus login: admin Password: admin admin@MSH8920:H1\$</pre>	Press [ENTER] to display the NOS' login-prompt Access the NOS' Linux shell-prompt

4.3.3. Invoke the CLI and Enter Configuration Mode

After NOS login has been performed, access the NOS' Command Line Interface configuration mode (#):

Command	Purpose
<pre>admin@MSH8920:H1\$ cli Synchronizing configuration...OK. Pica8 PICOS Version 2.9.3.9 Welcome to PICOS on Xorplus admin@Xorplus> configure Entering configuration mode. There are no other users in configuration mode. admin@Xorplus#</pre>	Enter the NOS' CLI mode From privileged EXEC mode (>), enter global configuration mode (#)

4.3.4. Configure the NOS' 'Management Network Interface' IP Address

Configure Switch Management Network Interface as follows and commit changes.

Notice
 Replace <IP_ADDRESS/NETMASK> by intended the IP address and netmask (e.g. 192.168.1.2/24), and <GATEWAY_IP> by appropriate gateway address (e.g. 192.168.1.1) for this switch/NOS.

Command	Purpose
<pre>admin@Xorplus# set system management-ethernet eth1 ip-address IPv4 <IP_ADDRESS/NETMASK> admin@Xorplus# set system management-ethernet eth1 ip-gateway IPv4 <GATEWAY_IP> admin@Xorplus# commit admin@Xorplus# exit admin@Xorplus> exit admin@MSH8920:H1\$</pre>	Set switch management IP address and netmask Set gateway IP address Apply changes Exit configuration mode Exit from CLI to Linux-prompt

Tip
 For scripting/automation purposes, it is possible to run CLI commands from the Linux command line by using the 'cli -c ' command and appending the corresponding instructions; The exit instructions do not need to be specified in this case.

As an example, to configure the NOS' Management Network Interface IP Address via the command line:

```
admin@MSH8920:H1$ cli -c "configure; set system management-ethernet eth1 ip-address IPv4 <IP_ADDRESS/NETMASK>; set system management-ethernet eth1 ip-gateway IPv4 <GATEWAY_IP>; commit"
```

4.3.5. Access Switch 2's NOS (Linux-prompt)

The same steps must be repeated on the second (right-side) switch. Use the following command to transfer serial port connection accordingly:

Command	Purpose
<code>admin@MSH8920:H1\$ sudo ipmitool raw 0x3e 0x62 0xB4 0x90 0x91 0x8B 0x9c 0x00 0x5f 0xff</code>	Use IPMI command to redirect serial console multiplexer to the switch CLI of the second MSH-HubNode (H2).

Tip

This raw command is equivalent to using "Ctrl+g _" to redirect the serial port multiplexer.

The "Ctrl+g _" command is performed by pressing the Ctrl and g keys simultaneously (The ASCII control code for "Ctrl-g" is 7), then entering the underscore character key followed by the Enter key.

After the command is sent there will be no confirmation, Press [ENTER] to see the Switch (NOS) Login-prompt.

Next login using the admin/admin credentials, and repeat the 2 previous sections: 'Invoke the CLI and Enter Configuration Mode' and 'Configure the NOS' 'Management Network Interface' IP Address'; this time, use the intended IP address, netmask & gateway for the second switch.

4.4. Import Switch-configuration Files

Notice

Make sure the above "Invoke the CLI and Enter Configuration Mode" and "Configure the NOS' Management Network Interface IP Address" steps are also performed on the second switch before proceeding with the next steps. The following steps can only be performed once both switches are accessible via SSH using their newly-configured IP addresses.

4.4.1. Overview

The switch configuration files previously created and exported as part of the "Export Switch Configuration Files" procedure will be copied to each switch in order to subsequently apply the configuration.

4.4.2. Import Configuration Files to Each Switch

From the remote computer, copy the switch configuration file to each switch's /pica/config/admin folder.

Command	Purpose
<code>RemoteComputer\$ scp <configFile> admin@<Switch_1_IP>:/pica/config/admin</code>	Remotely copies switch configuration file to first switch
<code>RemoteComputer\$ scp <configFile> admin@<Switch_2_IP>:/pica/config/admin</code>	Remotely copies switch configuration file to second switch

Notice

If the left/right switches require a different configuration, make sure that the appropriate configuration file is transferred to each switch.

4.5. Import the Custom HPM Files

The HPM files that were created and exported as part of the "Build Pre-configured BIOS-only HPM File(s)" procedure must also be transferred to the configuring switch from the remote computer; as a reference, the following scp commands:

Command	Purpose
RemoteComputer\$ scp BIOS_MSP8040_CFG_1.14.09216DD2.hpm admin@<Switch_1_IP>:/tmp	Remotely copies pre-configured MSP804x hpm file
RemoteComputer\$ scp BIOS_MSP8060_CFG_1.05.0921ED8B.hpm admin@<Switch_1_IP>:/tmp	Remotely copies pre-configured MSP806x hpm file

Tip

The HPM files will be applied from the configuring switch; there is no need to also copy these to the second switch.

4.6. Import and Install the Symcloud MS-Configuration-Helper Package and Support Files

4.6.1. Overview

These steps describe how to transfer the MS-Configuration-Helper package and required files to the first switch, and how to install the package in order to be able to deploy platform configuration afterwards.

Tip

The configuration scripts will be run from the configuring switch; there is no need to also copy these to the second switch.

4.6.2. Import MS-Configuration-Helper Package

The ms-configuration-helper_X.X.tar.gz package must be transferred to the configuring switch. As an example, the package can be copied with the following scp command, from a remote computer:

Command	Purpose
RemoteComputer\$ scp ms-configuration-helper_X.X.tar.gz admin@<Switch_1_IP>:/tmp	Remotely copies package to target switch

4.7. Install Configuration Helper Package

4.7.1. Access the Configuring Switch's NOS (Linux-prompt)

From the remote computer, establish an SSH session to the configuring switch in order to install the package:

Command	Purpose
RemoteComputer\$ ssh admin@<Switch_1_IP> admin@<Switch_1_IP>'s password: admin admin@MSH8920:H1\$	Start SSH session to first switch

4.7.2. Extract and Install the Configuration Helper Package

Command	Purpose
admin@MSH8920:H1\$ cd /tmp admin@MSH8920:H1\$ tar xzf ms-configuration-helper_X.X.tar.gz	Uncompress and extract the MS-Configuration-Helper package
admin@MSH8920:H1\$ cd ms-configuration-helper admin@MSH8920:H1\$ sudo ./lib_install.sh	Install required libraries

5. Apply Configurations



5.1. Apply Switch Configuration

5.1.1. Overview

These steps describe how to apply the switch configuration using the previously imported configuration file.

Notice

Switch 1 refers to the switch in the leftmost slot, and Switch 2 refers to the switch in the rightmost slot. Since it is possible to lose LAN connection to Switch 2 when applying the configuration on Switch 1, Switch 2 is the first to have its new configuration applied in this section.

5.1.2. Access Switch 2's NOS (Linux-prompt)

Establish an SSH session to Switch 2 (right-side) from the remote computer:

Command	Purpose
<pre>RemoteComputer\$ ssh admin@<Switch_2_IP> admin@<Switch_2_IP>'s password: admin admin@MSH8920:H2\$</pre>	Start SSH session to Switch 2

5.1.3. Launch the CLI and Enter Configuration Mode

Once SSH session is established, run the following commands:

Command	Purpose
<pre>admin@MSH8920:H2\$ cli Synchronizing configuration...OK. Pica8 PICOS Version 2.9.3.9 Welcome to PICOS on Xorplus admin@Xorplus> configure Entering configuration mode. There are no other users in configuration mode. admin@Xorplus#</pre>	Launch the switch CLI From privileged EXEC mode (>), enter global configuration mode (#)

5.1.4. Load the Reference Configuration

While in configuration mode of the NOS CLI, load the switch configuration from the previously imported configuration file.

<p>Info</p> <p>The new configuration is not effective yet.</p>
--

Command	Purpose
<pre>admin@Xorplus# load override <configFile> Loading config file... Config file was applied successfully. admin@Xorplus#</pre>	<p>Load the new switch configuration from file</p>

<p>Notice</p> <p>Potential error message:</p> <p>Failed to load the config file. The default configuration must be included in the loading config file.</p> <p>This may indicate that the reference MSH8920 switch from which the configuration file was captured was running a different NOS (PicOS) version than the current switch; it is possible that some configuration elements might be missing from the config file. Make sure the PicOS version displayed when invoking the CLI (example shown - see "Launch the CLI and Enter Configuration Mode") matches the one displayed at the top of the reference (imported) config-file:</p> <pre>admin@MSH8920:H1\$ head /pica/config/admin/myConfig.conf /*XORP Configuration File, v1.0*/ /* Copyright (C) 2009-2018 Pica8, Inc.*/ /*Last commit : Tue Apr 24 13:46:56 2018 by admin*/ /*PICOS Version : 2.9.3.9*/ /*Version Checksum : 78f304a1214decde5fdf421cea8340ac*/ /*Has Deprecated Node: 0*/ interface { ecmp { max-path: 4 hash-mapping { admin@MSH8920:H1\$</pre> <p>In case of a version mismatch, it is possible to perform a <code>load merge</code> command instead of <code>load override</code>, but the resulting configuration should be double checked in that case.</p>
--

<p>Tip</p> <p>In the event of a PicOS version mismatch as described above, and once a <code>load merge</code> command is completed and the complete configuration has been verified, it is possible to save the resulting running configuration and export it as described in the "Export Switch Configuration Files" section so it can then be used going forward on remaining MSH8920 with the new PicOS version.</p>

Prior to committing the new configuration, ensure that the IP address for the switch has been re-configured to this specific unit's (unique) address in order to prevent IP-address conflicts with the reference switch, etc. The steps are the same as described in the "Configure the NOS' Management Network Interface IP Address" part of the "Initial Switches Remote Access Configuration" section: Replace `<IP_ADDRESS/NETMASK>` by the intended IP address and netmask (e.g. 192.168.1.2/24), and `<GATEWAY_IP>` by the appropriate gateway address (e.g. 192.168.1.1).

Command	Purpose
<pre>admin@Xorplus# set system management-ethernet eth1 ip-address IPv4 <IP_ADDRESS/NETMASK> admin@Xorplus# set system management-ethernet eth1 ip-gateway IPv4 <GATEWAY_IP></pre>	<p>Set switch management IP address and netmask</p> <p>Set gateway IP address</p>

5.1.5. Verify the Switch Configuration

The configuration that is about to be applied should be verified for errors.

Command	Purpose
admin@Xorplus# show all	Shows switch configuration

5.1.6. Apply the Switch Configuration

The new switch configuration can then be applied.

Command	Purpose
admin@Xorplus# commit admin@Xorplus# exit admin@Xorplus> exit admin@MSH8920:H2\$	Apply changes Exit from configuration mode Exit from CLI to Linux-prompt

Notice

Depending on the configuration applied, LAN and/or SSH connection to the switch may be lost after the `commit` command. Configuration should still be applied successfully.

Info

Depending on configuration changes committed, the cli may prompt the user to reboot the system to complete applying the changes (e.g.: if changing interface breakout settings, etc.). This can be achieved by typing command `sudo reboot` at the `admin@MSH8920:Hx$` (Linux) command-prompt.

5.1.7. Access Switch 1's NOS (Linux-prompt)

Establish an SSH session to Switch 1 (Left-side) from the remote computer:

Command	Purpose
RemoteComputer\$ ssh admin@<Switch_1_IP> admin@<Switch_1_IP>'s password: admin admin@MSH8920:H1\$	Start SSH session to second switch

Repeat the same steps on switch 1 as was done for Switch 2 above; be sure to specifying the intended parameters for switch 1.

Notice

Make sure that all of the above steps have been completed on both switches before proceeding with the next steps.

5.2. Apply System-wide IPMI-over-LAN Configuration

5.2.1. Overview

The MS2920 platform involves a multitude of (management) IPMI-over-LAN interfaces to remotely control internal components; Configuring all these interfaces using "Static" IP addresses requires a significant number of IPMI commands. This section describes how to use the `SymkloudLanConfig` tool to streamline the configuration of (all of) these interfaces.

The tool starts from a base IP address, provided as a command line argument, and computes the contiguous addresses required to configure all management IP addresses in the targeted platform. The base IP address is assigned to the ShMC on the left-side (H1) MSH8920, and all the other addresses are then incrementally assigned to all other interfaces. The total number of addresses required will vary (between 11 and 29) depending on the MSP-Node and MSH-HubNode population in the target chassis; Each MSH8920 and MSP8040 require a single management IP address, while each MSP8060 requires three.

Warning

Care must be taken to ensure that:

- Switches have their NOS Management IP address assigned outside of the range used below
- Ranges used by individual systems do not overlap
- Subnets contain sufficient sequential host-addresses for all components, starting from the 'base' address

Run the script as root (or using 'sudo'); hardware access is required to communicate with the on-board (local) ShMC.

5.2.2. Invoke the SymcloudLanConfig Tool

Info

Further commands from this point must be entered in the SSH session that has previously been established to Switch 1.

The following script applies a static IPMI-over-LAN configuration to all IPMI components in the MS2920 platform; The required command line arguments are:

- **<Base_IP_Address>**: The first IP address of the address range assigned to the target chassis (e.g. 192.168.10.10); This IP address is assigned to the left-side ShMC (H1).
- **<Netmask>**: The netmask of the target subnet (e.g. 255.255.255.0). The same netmask is assigned to all IPMI components.
- **<Gateway>**: The default gateway for the target subnet (e.g. 192.168.10.1). The same default gateway is assigned to all IPMI components.
- **<VLAN>**: The VLAN ID to use (default: 4093; Using value 0 disables management VLAN-tagging). The same VLAN setting is assigned to all IPMI components.

Notice

The **<Base_IP_Address>** must be reachable via Switch 1's NOS Management Network Interface (eth1).

Command	Purpose
<pre>admin@MSH8920:H1\$ cd /tmp/ms-configuration-helper/SymcloudLanConfig admin@MSH8920:H1\$ sudo python SymcloudLanConfig.py --baseaddress <Base_IP_Address> --netmask <Netmask> --gateway <Gateway> --vlan <VLAN> --accept</pre>	Initiates system-wide IOL configuration using provided parameters.

Notice

All indicated command line arguments are required, otherwise the tool will interactively ask for the missing parameters.

Info

The output of the script will show the address set for the active shelf manager (ShMC), identified with an asterisk (*); Note this value for later steps.

Info

Running the the script again with the '--show' argument will list all IPMI components in the system and IP addresses assigned.

Warning

IPMI communication may be interrupted if the 'golden' configuration to be applied changes the default Management VLAN (4092/4093) configuration. Additional precautions may be required to mitigate this risk.

Info

For each IPMI component within the target chassis, the script will display the IP address assigned and also verify that settings are properly applied.

Sample output:

Scanning symkcloud, Please wait...

Selected Configuration :

Position	Product	Interface	IP Address	Netmask	Gateway	VLAN
HUB Slot 1	MSH8920	ShMC (*)	172.16.252.1	255.255.0.0	172.16.0.1	4093
HUB Slot 2	MSH8920	ShMC	172.16.252.2	255.255.0.0	172.16.0.1	4093
Slot 1	MSP8060	Board BMC	172.16.252.3	255.255.0.0	172.16.0.1	4093
Slot 1	MSP8060	CPU1 BMC	172.16.252.4	255.255.0.0	172.16.0.1	4093
Slot 1	MSP8060	CPU2 BMC	172.16.252.5	255.255.0.0	172.16.0.1	4093
Slot 2	MSP8060	Board BMC	172.16.252.6	255.255.0.0	172.16.0.1	4093
Slot 2	MSP8060	CPU1 BMC	172.16.252.7	255.255.0.0	172.16.0.1	4093
Slot 2	MSP8060	CPU2 BMC	172.16.252.8	255.255.0.0	172.16.0.1	4093
Slot 3	MSP8060	Board BMC	172.16.252.9	255.255.0.0	172.16.0.1	4093
Slot 3	MSP8060	CPU1 BMC	172.16.252.10	255.255.0.0	172.16.0.1	4093
Slot 3	MSP8060	CPU2 BMC	172.16.252.11	255.255.0.0	172.16.0.1	4093
Slot 4	MSP8060	Board BMC	172.16.252.12	255.255.0.0	172.16.0.1	4093
Slot 4	MSP8060	CPU1 BMC	172.16.252.13	255.255.0.0	172.16.0.1	4093
Slot 4	MSP8060	CPU2 BMC	172.16.252.14	255.255.0.0	172.16.0.1	4093
Slot 5	MSP8060	Board BMC	172.16.252.15	255.255.0.0	172.16.0.1	4093
Slot 5	MSP8060	CPU1 BMC	172.16.252.16	255.255.0.0	172.16.0.1	4093
Slot 5	MSP8060	CPU2 BMC	172.16.252.17	255.255.0.0	172.16.0.1	4093

(*) Active ShMC

Shutting Down: Slot 1 | MSP8060 | Board BMC
Shutting Down: Slot 2 | MSP8060 | Board BMC
Shutting Down: Slot 3 | MSP8060 | Board BMC
Shutting Down: Slot 4 | MSP8060 | Board BMC
Shutting Down: Slot 5 | MSP8060 | Board BMC

Waiting for nodes to power off...

Applying: HUB Slot 1	MSH8920	ShMC (*)	172.16.252.1	255.255.0.0	172.16.0.1	4093
Applying: HUB Slot 2	MSH8920	ShMC	172.16.252.2	255.255.0.0	172.16.0.1	4093
Applying: Slot 1	MSP8060	Board BMC	172.16.252.3	255.255.0.0	172.16.0.1	4093
Applying: Slot 1	MSP8060	CPU1 BMC	172.16.252.4	255.255.0.0	172.16.0.1	4093
Applying: Slot 1	MSP8060	CPU2 BMC	172.16.252.5	255.255.0.0	172.16.0.1	4093
Applying: Slot 2	MSP8060	Board BMC	172.16.252.6	255.255.0.0	172.16.0.1	4093
Applying: Slot 2	MSP8060	CPU1 BMC	172.16.252.7	255.255.0.0	172.16.0.1	4093
Applying: Slot 2	MSP8060	CPU2 BMC	172.16.252.8	255.255.0.0	172.16.0.1	4093
Applying: Slot 3	MSP8060	Board BMC	172.16.252.9	255.255.0.0	172.16.0.1	4093
Applying: Slot 3	MSP8060	CPU1 BMC	172.16.252.10	255.255.0.0	172.16.0.1	4093
Applying: Slot 3	MSP8060	CPU2 BMC	172.16.252.11	255.255.0.0	172.16.0.1	4093
Applying: Slot 4	MSP8060	Board BMC	172.16.252.12	255.255.0.0	172.16.0.1	4093
Applying: Slot 4	MSP8060	CPU1 BMC	172.16.252.13	255.255.0.0	172.16.0.1	4093
Applying: Slot 4	MSP8060	CPU2 BMC	172.16.252.14	255.255.0.0	172.16.0.1	4093
Applying: Slot 5	MSP8060	Board BMC	172.16.252.15	255.255.0.0	172.16.0.1	4093
Applying: Slot 5	MSP8060	CPU1 BMC	172.16.252.16	255.255.0.0	172.16.0.1	4093
Applying: Slot 5	MSP8060	CPU2 BMC	172.16.252.17	255.255.0.0	172.16.0.1	4093
Verified: HUB Slot 1	MSH8920	ShMC (*)	172.16.252.1	255.255.0.0	172.16.0.1	4093
Verified: HUB Slot 2	MSH8920	ShMC	172.16.252.2	255.255.0.0	172.16.0.1	4093
Verified: Slot 1	MSP8060	Board BMC	172.16.252.3	255.255.0.0	172.16.0.1	4093
Verified: Slot 1	MSP8060	CPU1 BMC	172.16.252.4	255.255.0.0	172.16.0.1	4093
Verified: Slot 1	MSP8060	CPU2 BMC	172.16.252.5	255.255.0.0	172.16.0.1	4093
Verified: Slot 2	MSP8060	Board BMC	172.16.252.6	255.255.0.0	172.16.0.1	4093
Verified: Slot 2	MSP8060	CPU1 BMC	172.16.252.7	255.255.0.0	172.16.0.1	4093
Verified: Slot 2	MSP8060	CPU2 BMC	172.16.252.8	255.255.0.0	172.16.0.1	4093
Verified: Slot 3	MSP8060	Board BMC	172.16.252.9	255.255.0.0	172.16.0.1	4093
Verified: Slot 3	MSP8060	CPU1 BMC	172.16.252.10	255.255.0.0	172.16.0.1	4093
Verified: Slot 3	MSP8060	CPU2 BMC	172.16.252.11	255.255.0.0	172.16.0.1	4093
Verified: Slot 4	MSP8060	Board BMC	172.16.252.12	255.255.0.0	172.16.0.1	4093
Verified: Slot 4	MSP8060	CPU1 BMC	172.16.252.13	255.255.0.0	172.16.0.1	4093
Verified: Slot 4	MSP8060	CPU2 BMC	172.16.252.14	255.255.0.0	172.16.0.1	4093
Verified: Slot 5	MSP8060	Board BMC	172.16.252.15	255.255.0.0	172.16.0.1	4093
Verified: Slot 5	MSP8060	CPU1 BMC	172.16.252.16	255.255.0.0	172.16.0.1	4093
Verified: Slot 5	MSP8060	CPU2 BMC	172.16.252.17	255.255.0.0	172.16.0.1	4093

5.3. Apply BIOS Configuration

5.3.1. Overview

These steps describe how to deploy pre-configured BIOS binaries to all (MSP8060 and/or MSP8060) servers in an MS2920 platform, via HPM. The IPMI-over-LAN configuration, as described in the previous section, must have been performed beforehand, as the BIOS-upgrade process depends on it.

Info

As the BIOS core version remains the same, regardless of the current configuration, the reported BIOS version will also remain the same once the BIOS has been re-applied.

Notice

After updating an MSP-Node with a pre-configured HPM, as created and exported as part of the "Export pre-configured BIOS HPM File" procedure:

- loading 'Setup Defaults' on a server will restore the its BIOS configuration to (standard) default options.
- performing a BIOS/FW upgrade from a standard HPM-file will restore the configuration for all servers on an MSP-Node to BIOS (standard) default options.

Notice

If the boot device population differs between reference MSP-Node and target MSP-Node (add/remove M.2, USB, etc.), the boot order configuration may not be the intended one.

5.3.2. Generate Bundle from pre-configured HPM File(s)

The following creates a file Bundle.zip that will be required for the next step.

Command	Purpose
<pre>admin@MSH8920:H1\$ cd ../OneClickGenerator admin@MSH8920:H1\$./OneClickGenerator.py --8040 /tmp/BIOS_MSP8040_CFG_1.14.09216DD2.hpm --8060 /tmp/BIOS_MSP8060_CFG_1.05.0921ED8B.hpm</pre>	Creates file Bundle.zip with specified HPM files, to be used for BIOS deployment

Tip

The 'Generate Bundle' can be skipped in subsequent deployments by reusing the Bundle.zip file in cases where BIOS versions, components (MSP8040 and/or MSP8060) and BIOS settings remain unchanged.

5.3.3. Deploy pre-configured BIOS to target MSP-Nodes

The following initiates BIOS deployment; The file Bundle.zip to use is the one that was saved at the end of the "Export pre-configured BIOS HPM File".

Command	Purpose
<pre>admin@MSH8920:H1\$ cd ../OneClickUpgrade # The active shelf manager controller (ShMC) IP was identified with (*) in the LAN configuration step. admin@MSH8920:H1\$./OneClickUpgrade.py --file ../One ClickGenerator/Bundle.zip --ip <Active_ShMC_IP></pre>	Triggers system-wide BIOS upgrade using pre-configured BIOS binaries.

Info

For the Active ShMC IP address, use the address displayed/noted during the "Invoke the SymkloudLanConfig Tool" step; it was identified with an asterisk (*).

Info

The script will display the progress and status of the update process; Once completed, it is safe to deploy the Operating Systems to the MSP-Nodes.