Performance Technologies
Application Note
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ISM IP Addressing and High Availability

Introduction

Shelf management ensures maximum service availability in a computing platform by monitoring sensors and predicting failures. Performance Technologies' Intelligent Shelf Manager (ISM) offers a comprehensive management architecture that delivers high availability protection with reliable, redundant and IPMI (Intelligent Platform Management Interface) standards-based management to all the major components in the shelf, including the entire IPnexus® product family.

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In addition to communicating through the IPMI bus, the ISM also has to communicate to the external monitoring device/system. In order to do that, the ISM needs at least one, and usually several IP addresses. These IP addresses allow personnel to interface directly to the ISM via the RJ45 connector on the front panel, or through the midplane of the chassis.

Many customers want to access the ISM through the uplink of Fabric switches, across the 2.16 backplane and to the ISM. When a system is configured to have the ISM's uplink via the 2.16 midplane, it must also go through the switches in the chassis. There is one fault in this configuration; it is not highly available. For example, if ISM A is active and Fabric A fails then you will lose connectivity (SNMP, telnet, ping etc) to ISM A. ISM A does not look to see if Fabric A has failed and therefore will not fail over to Fabric B. ISM A will continue to operate properly and all the cards in the chassis will remain powered up.

Objective

For some customers this kind of failure is acceptable since they will replace any defective switch within a short time. Other customers will want uninterrupted communication to the ISM no matter what happens. This document outlines the configuration necessary to have redundancy in your ISM uplink via the switches.

You will need a 2.16 compliant chassis, two ISMs, and two fabric switches, such as the PT-CPC6600, a 24-port 10/100/1000 TX Ethernet switch, and appropriate Ethernet cabling.

Implementation

There are two ways to implement this kind of HA: external cabling (see Figure 1) or by creating a custom midplane with additional traces. Below are instructions for setting the boot variables needed to achieve HA for ISM accessibility through external cabling. Two external cables will be needed – one to go from eth0 on each ISM to the opposite switch.

This HA solution uses the Performance Technologies virtual Ethernet driver (vEnet). The vEnet driver is an IP failover virtual Ethernet interface driver that allows IP addresses to switch between two physical Ethernet adapters on the same ISM. In this HA configuration, the vEnet driver is used on Eth0 and Eth1 on each ISM. This allows each ISM to have connectivity to the uplink, even if one of the fabrics goes down. For more detail on the vEnet driver, see the CPC7301 Software Manual.

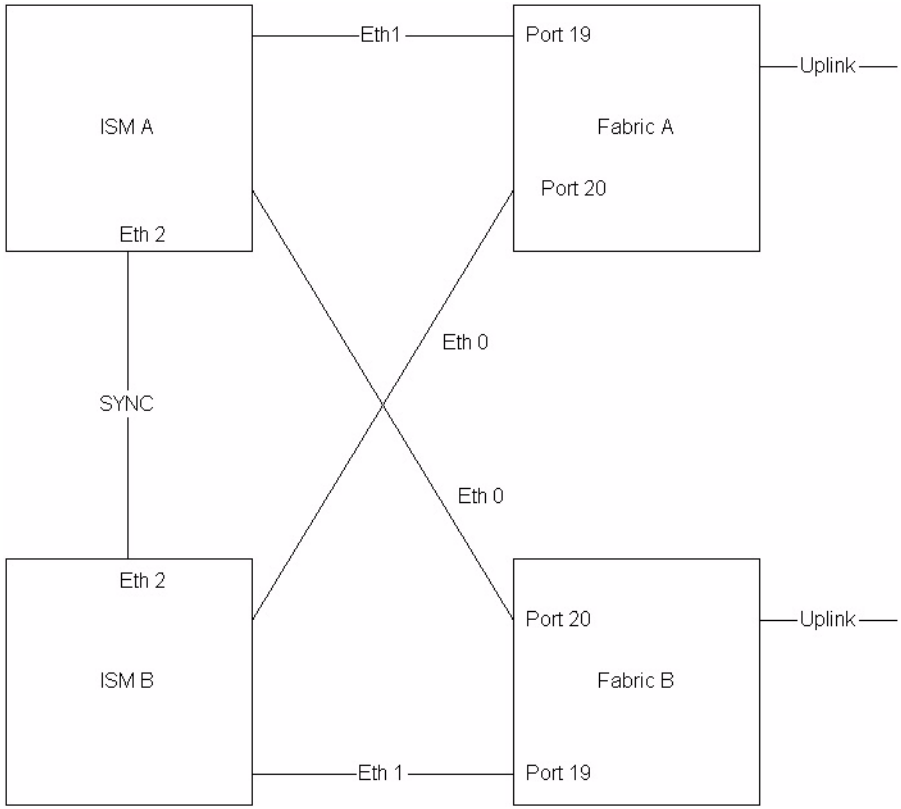

Figure 1-1: Figure 1: HA Configuration

Configuring the ISMs

The following steps describe how to configure your ISMs.

To configure the ISMs

1 Connect to a terminal or workstation running terminal-emulation software to the console port of the ISM on the lower left of the chassis. We will refer to this ISM as ISM A. You will need:

- A serial cable with proper pin connections for the ISM console port as described in the current *CPC7301 Intelligent Shelf Manager Hardware Manual*.
- Set your terminal emulation software to connect at 9600, N, 8, 1.

  -OR-

- Connect to the ISM via a Telnet session and the **Eth0** front panel RJ45 connector interface. The default IP address is **192.168.0.1**.

2 Log in to the system by entering the following:

Login: **root**

Password: (none by default, just press ENTER)

3 At the # prompt, configure the ISM by typing the following commands (substitute the IP addresses and subnetmasks that apply to your local network):

```
bootvars set sync_device eth2
bootvars set sync_netmask 255.255.255.0
bootvars set active_netmask 255.255.0.0
bootvars set gateway 172.30.1.254
bootvars set sync_ipaddr 192.168.1.4
bootvars set rear_eth_connector y
bootvars set netmask 255.255.255.252
bootvars set active_device eth3:1
bootvars set active_ipaddr 172.30.98.3
bootvars set VENET_SEC_IF eth0
bootvars set VENET_PRI_IF eth1
bootvars set VENET_FLAGS 0x00000002
bootvars set ipdevice_c eth3
bootvars set netmask_c 255.255.0.0
bootvars set IPADDR_C_TOP 172.30.98.1
bootvars set IPADDR_C_BOTTOM 172.30.98.2
bootvars set VENET_GATEWAY y
bootvars set network_reset y
```

```
DO NOT REBOOT AT THIS TIME!
```

4 After modifying the boot variables on the first ISM, let's move to the second ISM…

5 Connect to a terminal or workstation running terminal-emulation software to the console port of the ISM on the lower right of the chassis in the same manner as the first ISM.

6 Log in to the system by entering the following:

Login: **root**

Password: (none by default, just press ENTER)

7 At the # prompt, configure the ISM by typing the following commands (substitute the IP addresses and subnetmasks that apply to your local network):

```
bootvars set sync_device eth2
bootvars set sync_ipaddr 192.168.1.4
bootvars set sync_netmask 255.255.255.0
bootvars set active_netmask 255.255.0.0
bootvars set gateway 172.30.1.254
bootvars set rear_eth_connector y
bootvars set netmask 255.255.255.252
bootvars set active_device eth3:1
bootvars set active_ipaddr 172.30.98.3
bootvars set VENET_SEC_IF eth0
bootvars set VENET_PRI_IF eth1
bootvars set VENET_FLAGS 0x00000002
bootvars set ipdevice_c eth3
bootvars set netmask_c 255.255.0.0
bootvars set IPADDR_C_TOP 172.30.98.1
bootvars set IPADDR_C_BOTTOM 172.30.98.2
bootvars set VENET_GATEWAY y
bootvars set network_reset y
```

With the boot variables configured as above, the virtual Ethernet (vEnet) driver is configured to switch between eth0 and eth1, but will look like eth3 to the OS. The active device becomes eth3:1 which is also utilizing eth0 and eth1 for redundancy.

8 Now that both ISMs have had their boot variables set accordingly, they need to be rebooted. Because we modified the “active_ipaddr” variable from the default, the reboot needs to be performed simultaneously, or within roughly 30 seconds of each other. This is done to prevent the ISMs from resetting these variables by synchronizing the data with one another. To do this, simply type “reboot” at the Linux prompt on each ISM and hit enter on each ISM within 30 seconds of each other.

Note *IP configurations changes will not take effect until the system is rebooted. If you performed the configuration changes over a telnet session, you need to start a new telnet session with the new active IP address; otherwise, you can just log in again at a serial console window.*

9 Once the ISMs have rebooted, you can check the changes you made on each ISM by typing bootvars print at the prompt. Also, follow this up with running ifconfig to ensure the proper network configurations have taken effect.

10 To verify that your uplink is truly redundant, with the ISMs configured and cabling installed as described in this document, send a ping from one of your ISMs out the uplink. With the ping going on, hot swap out one of the switches, then hot swap it back in. Then hot swap out the other switch and swap it back in. You will see that regardless of which switch is down, the ISM continues to communicate with the "outside world."