



# Sun Blade™ T63X0 PCIe Pass-Through Fabric Expansion Module User's Guide

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# Preface

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This user's guide provides instructions for installing and configuring the Sun Blade T63X0 PCIe Pass-Through Fabric Expansion Module (FEM) in a Sun Blade T6320 or T6340 server module.

These instructions are designed for enterprise system administrators with experience installing network hardware and software.

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## Using UNIX Commands

This document might not contain information about basic UNIX<sup>®</sup> commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with the system
- Solaris<sup>™</sup> Operating System documentation, which is at:  
(<http://docs.sun.com>)

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## Related Documentation

Documents related to this FEM are available at:

(<http://docs.sun.com/app/docs/prod/blade.6000mod#hic>)

(<http://docs.sun.com/app/docs/prod/blade.6048mod#hic>)

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Document	Description
<i>Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module User's Guide</i> , 820-6561	Configuration information for NEMs and attached components.
<i>Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module Product Notes</i> , 820-6564	
<i>Sun Blade T6340 Server Module Product Notes</i> , 820-3901	ILOM and ALOM-CMT tools and related administration procedures for the server modules.
<i>Sun Blade T6320 Server Module Product Notes</i> , 820-2383	

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*Sun Blade T63X0 PCIe Pass-Through Fabric Expansion Module User's Guide*, part number 820-7117-11.

# Sun Blade T63X0 PCIe Pass-Through Fabric Expansion Module Overview

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The Sun Blade™ T63X0 PCIe Pass-Through Fabric Expansion Module (FEM) provides two x4 PCIe lanes between the server module, the chassis midplane, and a PCIe NEM in the server module chassis (FIGURE 1-1 and FIGURE 1-2).

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## FEM Overview

The Sun Blade T6320 and Sun Blade T6340 server modules each have two hot-pluggable ports on the motherboard. However, those ports are dedicated to the PCI-EM ports on a server module chassis. To provide hot-plug support for the network express modules (NEMs), you must install this Sun Blade T63X0 PCIe Pass-Through Fabric Expansion Module (FEM). (FIGURE 1-1)

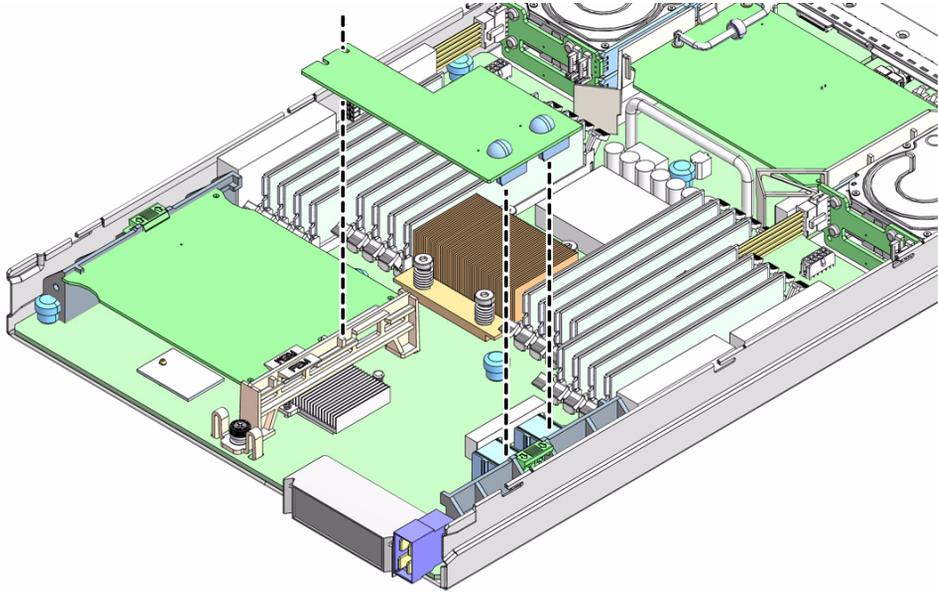
This FEM is needed for the T6320 and T6340 servers to connect with the Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module (NEM).

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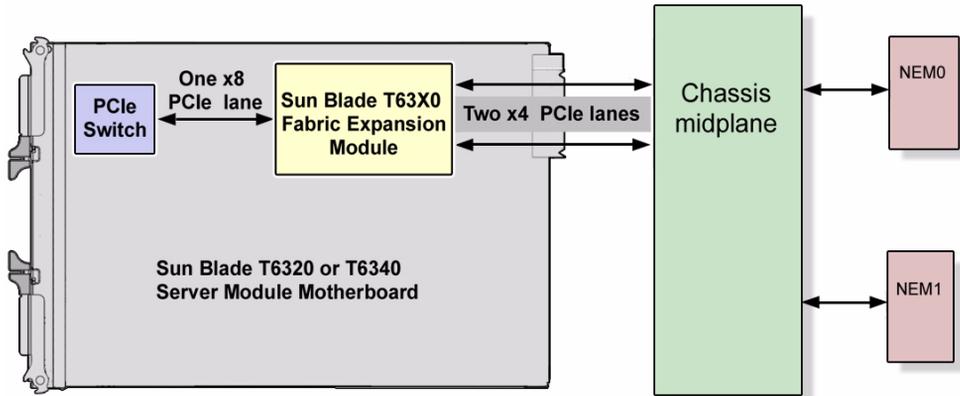
**Note** – Before you install the FEM and NEM, you must ensure that certain firmware and software components are up to date. See [Chapter 2](#) for details.

---

**FIGURE 1-1** FEM With a Sun Blade T6320 Server Module



**FIGURE 1-2** FEM Block Diagram



# Required Preinstallation Verification and Updates

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Before you install the Sun Blade T63X0 PCIe Pass-Through FEM, you must check certain hardware, firmware, and software components on the Sun Blade T6320 or T6340 server module. If any components do not meet minimum revision levels, you must update them.

This chapter describes the following information:

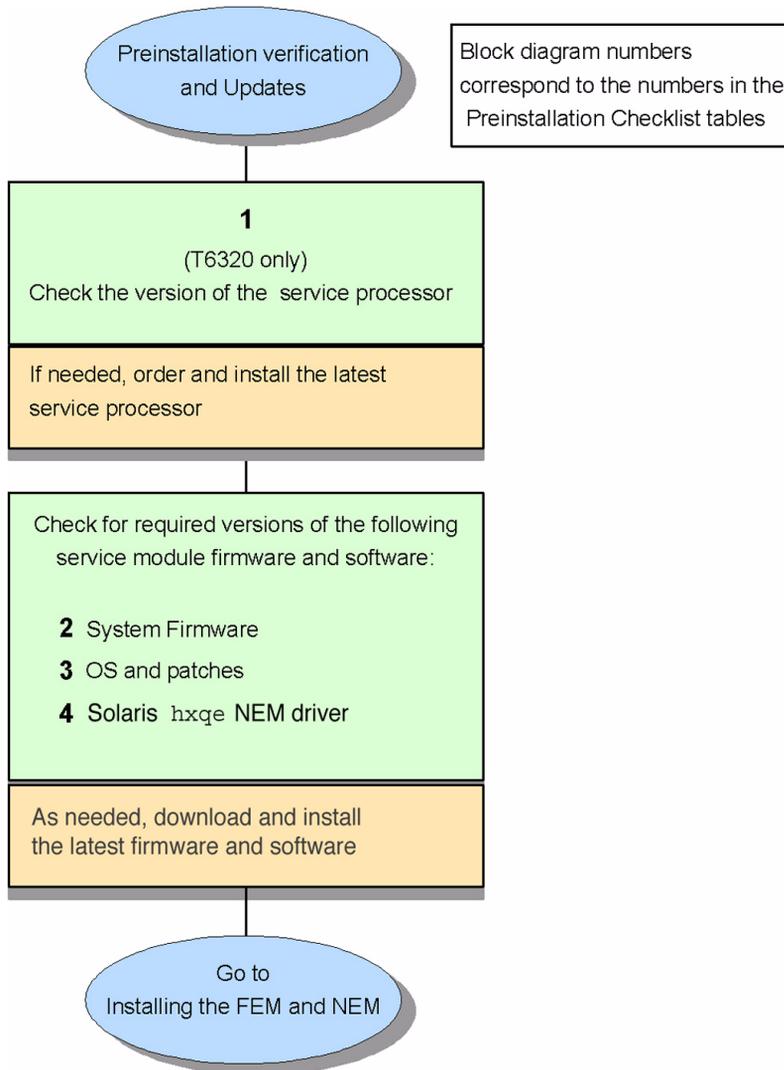
- [“Preinstallation Verification and Updates”](#) on page 3
- [“To Check the Service Processor Version”](#) on page 7
- [“To Check the System Firmware Version”](#) on page 8
- [“To Update the Motherboard CPLD Firmware”](#) on page 9
- [“To Check the Server Module Solaris Release”](#) on page 9
- [“To Check the hxge Driver”](#) on page 9

---

## Preinstallation Verification and Updates

[FIGURE 2-1](#), [TABLE 2-1](#) and [TABLE 2-2](#) describe important verifications you must perform before you install the Sun Blade T63X0 PCIe Pass-Through FEM.

**FIGURE 2-1** Preinstallation Block Diagram



**TABLE 2-1** Sun Blade T6320 Server Module Preinstallation Checklist

	Preinstallation Verification	Minimum Version	Action Required to Update
1	Check the version of the server module service processor. See <a href="#">“To Check the Service Processor Version”</a> on page 7.	One of the following service processor part numbers: <ul style="list-style-type: none"> <li>• 510-1170-06 (or later)</li> <li>• 511-1304-06 (or later)</li> </ul>	Order a replacement service processor and install it on the server module.
2	Check the version of the server module system firmware. See <a href="#">“To Check the System Firmware Version”</a> on page 8.	System firmware 7.2.2.g (or later)	Install System firmware patch 139440-04 (or later).
3	Update the server module motherboard CPLD firmware. See <a href="#">“To Update the Motherboard CPLD Firmware”</a> on page 9.	520-3983-03 or later	Install patch 142151-02 (or later)
4	Check the version of the Solaris OS installed on the server module. See <a href="#">“To Check the Server Module Solaris Release”</a> on page 9.	Solaris 10 5/09 (or later)	Update the server module OS
5	Check to see if the NEM hxge driver is installed. See <a href="#">“To Check the hxge Driver”</a> on page 9.	hxge driver package SW 2.0 (or later)	Install the hxge driver package SW 2.0 (or later).

**TABLE 2-2** Sun Blade T6340 Server Module Preinstallation Checklist

	Preinstallation Verification	Minimum Version	Action Required to Update
1	<b>Note</b> - All service processors in the Sun Blade T6340 server module support the Sun Blade T63X0 PCIe Pass-Through FEM.	All	N/A
2	Check the version of the server module system firmware. See <a href="#">“To Check the System Firmware Version”</a> on page 8.	System firmware 7.2.2.g (or later)	Install system firmware patch 139448-03 (or later).

**TABLE 2-2** Sun Blade T6340 Server Module Preinstallation Checklist (*Continued*)

	<b>Preinstallation Verification</b>	<b>Minimum Version</b>	<b>Action Required to Update</b>
3	Update the server module motherboard CPLD firmware. See <a href="#">"To Update the Motherboard CPLD Firmware"</a> on page 9.	520-4058-04 or later	Install patch 142152-02 (or later)
4	Check the version of the Solaris OS on the server module. See <a href="#">"To Check the Server Module Solaris Release"</a> on page 9.	Solaris 10 5/09 (or later)	Update the server module OS
5	Check to see if the NEM hxge driver is installed. See <a href="#">"To Check the hxge Driver"</a> on page 9.	hxge driver package SW 2.0 (or later)	Install the hxge driver package SW 2.0 (or later).

## ▼ To Check the Service Processor Version

Use this procedure to determine the version of the service processor in the Sun Blade T6320 server module.

---

**Note** – You do not need to perform this procedure for Sun Blade T6340 server modules.

---

**1. On the server module, use the following ALOM CMT compatibility command to identify the part number of the service processor:**

---

**Note** – For more information about the ALOM CMT compatibility shell, see [Appendix A](#).

---

```
sc> showfru /SYS/SP
...
/ManR/Fru_Description: ASSY,Sun-Blade-T6320 Service Processor
...
/ManR/Sun_Part_No: 5011170
...
/ManR/Initial_HW_Dash_Level: 06
```

**2. Compare the service processor part number to the following list:**

- 501-7822-xx (any revision) – You must replace the service processor with the latest version.
- 501-1170-05 (or earlier) – You must replace the service processor with the latest version.
- 511-1304-xx (any revision) – Do not replace this service processor. This service processor supports this FEM and NEM.

**3. If you must replace the service processor, order a replacement from Sun.**

Do not continue with the verification procedures or installation until you have installed the correct service processor. After the service processor replacement, the system firmware version might change and impact the following verification procedures.

## ▼ To Check the System Firmware Version

Use this procedure to determine the version of the system firmware on the server module.

1. Use the following ALOM CMT compatibility command to identify the version of system firmware:

---

**Note** – For more information about the ALOM CMT compatibility shell, see [Appendix A](#).

---

```
sc> showhost
Sun System Firmware 7.2.2.g 2009/08/05 18:30
...
...
```

2. Use the information in the following table to determine if you need to update the system firmware.

---

Server Module	Minimum System Firmware Version	Minimum Patch Version
Sun Blade T6320	7.2.2.g (or later)	Install patch 139440-04 (or later)
Sun Blade T6340	7.2.2.g (or later)	Install patch 139448-03 (or later)

---

3. If you need to install patches to update the system firmware, obtain the patches from the SunSolve<sup>SM</sup> web site:

<http://sunsolve.sun.com>

Download the appropriate patch. Follow the instructions in the patch README file.

## ▼ To Update the Motherboard CPLD Firmware

1. Determine which patch is needed from the table below.

---

Server Module	Required Patch to Update CPLD Firmware
Sun Blade T6320	142151-02 (or later)
Sun Blade T6340	142152-02 (or later)

---

2. Obtain the patch from the SunSolve web site:

(<http://sunsolve.sun.com>)

3. Follow the instructions in the patch README file.

## ▼ To Check the Server Module Solaris Release

1. At the server module host console, run the following Solaris command to identify the version of the OS:

---

**Note** – For more information about accessing the host console, see [Appendix A](#).

---

```
% cat /etc/release
Solaris 10 5/09 SPARC
Copyright 2009 Sun Microsystems, Inc. All Rights Reserved.
Use is subject to license terms.
Assembled 01 May 2009
```

The Solaris 10 5/09 OS is the minimum required OS.

2. If needed, upgrade the Solaris 10 OS to the required version.

---

**Note** – If you upgrade the Solaris OS, check the server module product notes to find out if you need to install additional required Solaris patches.

---

## ▼ To Check the hxge Driver

Use this procedure to determine if the required hxge driver is installed on the server module.

**1. Verify that the latest hxge driver is installed using the showrev command.**

Example:

```
% pkginfo -l SUNWhxge
PKGINST:  SUNWhxge
      NAME:  SUN 10Gb hxge NIC Driver
CATEGORY:  system
      ARCH:  sparc
VERSION:   11.10.0,REV=2009.10.02.21.36
BASEDIR:   /
VENDOR:   Sun Microsystems, Inc.
      DESC:  SUN 10Gb hxge Ethernet Network Adapter Driver
PSTAMP:   on10-public20091003082537
INSTDATE: Oct 05 2009 11:19
```

**2. If needed, obtain the Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module Software 2.0 (SWV2.0) package from the Sun download center:**

(<http://www.sun.com/servers/blades/downloads.jsp#6000v>)

The installation procedures for the Solaris drivers are explained in the *Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module User's Guide*, 820-6561.

The user's guide also describes how to configure the drivers and network host files and provides instructions for enabling jumbo frames.

The product notes contain late-breaking information:

*Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module Product Notes*, 820-6564

The NEM documents are available at:

(<http://docs.sun.com/app/docs/prod/blade.6000mod#hic>)

(<http://docs.sun.com/app/docs/prod/blade.6048mod#hic>)

## Installing the FEM

---

This chapter describes how to install the FEM in the server module.

---

## Installing the FEM

After ensuring that the server module has the required service processor, firmware, OS, and patches, you can install the FEM into the server module.

### ▼ To Prepare for Installation

- 1. Perform an orderly shutdown of the server module.**
- 2. Remove the server module from the system chassis.**
- 3. Use an ESD wrist strap to prevent electrostatic damage to components.**

Attach the adhesive copper strip of the antistatic wrist strap to the server module. Wrap the other end twice around your wrist, with the adhesive side against your skin.

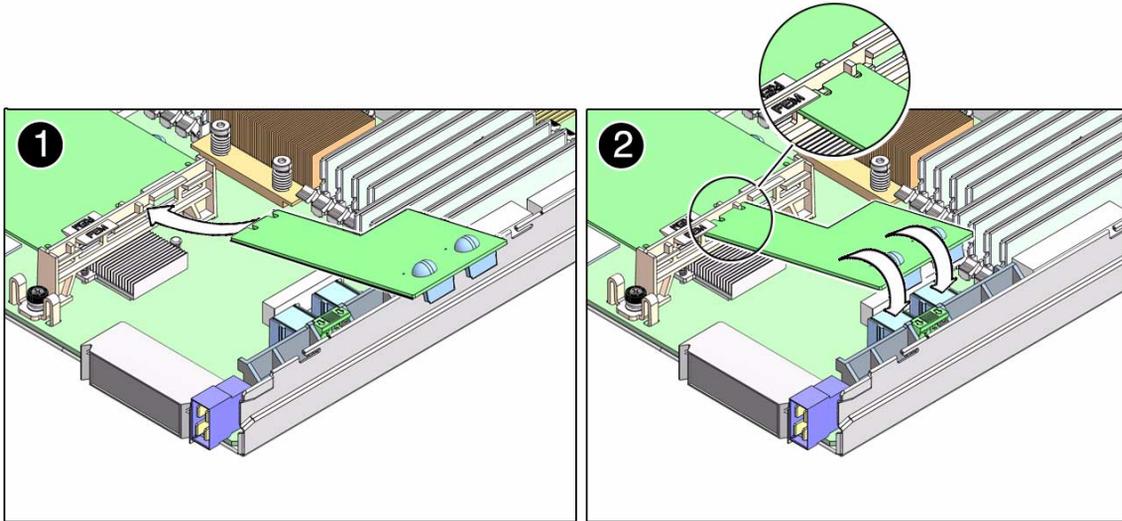
- 4. Remove the main cover of the server module.**

### ▼ To Install the FEM Into a Sun Blade T6320 Server Module

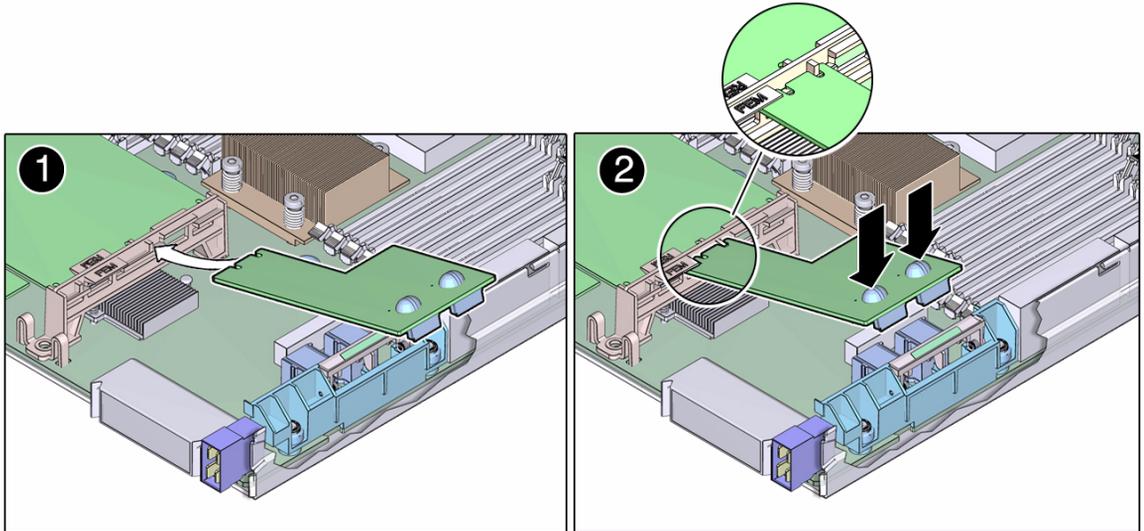
There are two types of support brackets for the Sun Blade T6320 server modules. Newer Sun Blade T6320 server modules have a latch to secure the FEM in place.

1. Slide the FEM card at an angle into the support bracket and carefully align the connectors (FIGURE 3-1).
2. Carefully press the rubber bumpers on the FEM to secure the FEM to the connectors.
3. Replace the server module cover and insert the server into the chassis.

**FIGURE 3-1** Installing the FEM Into the Sun Blade T6320 Server Module



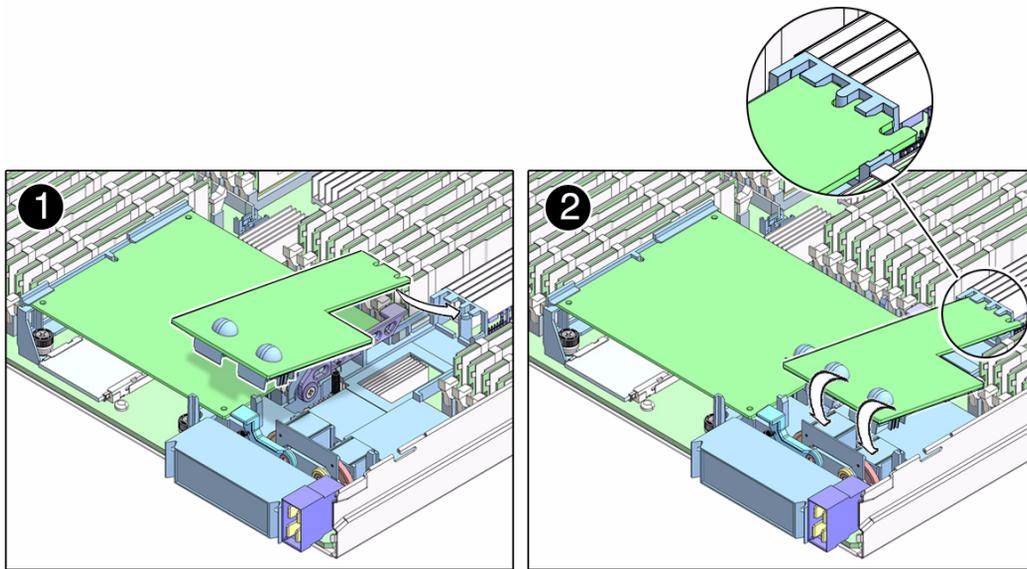
**FIGURE 3-2** FEM Module Installation in T6320 Server Modules with Newer FEM Release Lever Design



## ▼ To Install the FEM Into a Sun Blade T6340 Server Module

1. Insert the edge of the FEM into the bracket and carefully align the connectors (FIGURE 3-3).
2. Press firmly on the rubber buttons of the FEM until the connectors fully engage with the motherboard connectors.
3. Replace the server module cover and insert the server into the chassis.

**FIGURE 3-3** Installing the FEM into a T6340 Server Module



## Verifying NEM and FEM Functionality

---

After you install the FEM and NEM, perform the following tasks to verify the connections.

---

### To Verify the NEM and FEM Connections

1. Power on the system.
2. Access the `ok` prompt and type `show-devs`.

This example from a Sun Blade T6340 server module is abbreviated to show the FEM and NEM in the output.

```
ok show-devs
/pci-performance-counters@500
...
/pci@400/pci@0/pci@9/pci@0 <===The FEM
/pci@400/pci@0/pci@9/pci@0/pci@2 <===One x4 port on the FEM
/pci@400/pci@0/pci@9/pci@0/pci@1 <===One x4 port on the FEM
/pci@400/pci@0/pci@9/pci@0/pci@2/network@0 <===NEM1
/pci@400/pci@0/pci@9/pci@0/pci@1/network@0 <===NEM0
...
```

This example from a Sun Blade T6320 server module is abbreviated to show the FEM and NEM in the output.

```
ok show-devs
/pci@0/-performance-counters@0
...
/pci@0/pci@0/pci@d/pci@0
/pci@0/pci@0/pci@d/pci@2 <===One x4 port on the FEM
/pci@0/pci@0/pci@d/pci@1 <===One x4 port on the FEM
/pci@0/pci@0/pci@d/pci@2/network@0 <===NEM1
/pci@0/pci@0/pci@d/pci@1/network@0 <===NEM0
/pci@0/pci@0/pci@c/network@0,1 <===1GbE e1000g0 Ethernet port, motherboard chip
/pci@0/pci@0/pci@c/network@0 <===1GbE e1000g0 Ethernet port, motherboard chip
...
```

---

## Checking Connections Between the FEM and NEMs

After you install the FEM, perform the following tasks to verify the installation.

### ▼ To Verify PCIe Connectivity Between the FEM and NEMs

1. The following examples show connectivity between the FEM and two Sun Blade 6000 Virtualized Multi-Fabric 10GbE NEMs.

## 2. From the ok prompt, list the network devices on the system.

This examples was obtained using a Sun Blade T6340 server module.

```
ok show-nets
a) /pci@400/pci@0/pci@9/pci@0/pci@2/network@0 <==== NEM1
b) /pci@400/pci@0/pci@9/pci@0/pci@1/network@0 <==== NEM0
...
q) NO SELECTION
Enter Selection, q to quit
```

You should see the network devices in a) and b). If you do not see the network devices, verify that the FEM is properly seated.

This example is from a Sun Blade T6320 server module:

```
ok show-nets
a) /pci@0/pci@0/pci@d/pci@0/pci@2/network@0 <==== NEM1
b) /pci@0/pci@0/pci@c/pci@0/pci@1/network@0 <==== NEM0
...
q) NO SELECTION
Enter Selection, q to quit
```

## ▼ To Verify Ethernet Connections Between the FEM and NEMs

Use the watch-net-all command to confirm that the FEM is sending packets from the server module to the NEM in the chassis.

- From the `ok` prompt, change to the directory of the NEM that you want to observe, and type the `watch-net-all` command.

This Sun Blade T6340 example shows that the NEM in slot 0 of the chassis is receiving packets from the FEM:

```
ok cd /pci@400/pci@0/pci@9/pci@0/pci@1/network@0
ok watch-net-all
/pci@400/pci@0/pci@2/network@0,1
1000 Mbps full duplex Link up
Looking for Ethernet Packets.
'.' is a Good Packet. 'X' is a Bad Packet.
Type any key to stop.
```

This Sun Blade T6320 example shows that the NEM in slot 1 of the chassis is receiving packets from the FEM:

```
ok cd /pci@0/pci@0/pci@d/pci@0/pci@2/network@0
ok watch-net-all
/pci@0/pci@0/pci@d/pci@0/pci@2/network@0
1000 Mbps full duplex Link up
Looking for Ethernet Packets.
'.' is a Good Packet. 'X' is a Bad Packet.
Type any key to stop.
```

## ▼ To Reboot the System

- After verifying the FEM installation, perform a reconfiguration boot on the system so that the Solaris OS can recognize the new FEM.

```
ok boot -r
```

## ALOM CMT Shell

---

This appendix provides the following ILOM and ALOM CMT administrative procedures:

- [“Accessing and Switching Between Service Processor and Host”](#) on page 19
- [“Creating an ALOM CMT Compatibility Account”](#) on page 21

---

## Accessing and Switching Between Service Processor and Host

On the server module, you communicate with the following items:

- **Host** – the main processor on the server module that runs an OS. You communicate with the host by accessing the *host console*.
- **Service processor** – an integrated processor used to configure, boot, and manage the host. You communicate with the service processor through the *ILOM shell* or *ALOM CMT compatibility shell*.

---

**Note** – To use the ALOM CMT compatibility shell, you must create an ILOM user account specifically configured to recognize ALOM CMT compatibility commands. See [“Creating an ALOM CMT Compatibility Account”](#) on page 21.

---

This section describes how to access the host console and the service processor, and how to switch from one to the other.

## ▼ To Access the Service Processor

This procedure assumes that you have connectivity to the service processor. Refer to the server module installation documentation for details.

- **Based on the shell you want to use (ILOM or ALOM CMT), at the ILOM login prompt, log into an account:**
  - ILOM shell with superuser privileges – log in as `root` with the correct password. This account is created at the factory, and the password is created when the server module is initialized for the first time. This shell only recognizes ILOM commands. The prompt is `->`.
  - ILOM shell – log in using any of the ILOM accounts that you have established.
  - ALOM CMT compatibility shell – log in using the account created for the ALOM CMT compatibility shell (see [“Creating an ALOM CMT Compatibility Account” on page 21](#)). Often, the account is called `admin`. This shell recognizes only ALOM CMT compatibility commands. The prompt is `sc>`.

ALOM CMT Compatibility shell example:

```
SUNSPxxxxxxxx login admin
Password:
Waiting for daemons to initialize...

Daemons ready

Sun(TM) Integrated Lights Out Manager

Version 2.0.0.0

Copyright 2007 Sun Microsystems, Inc. All Rights reserved
Use is subject to license terms

sc>
```

## ▼ To Switch Between the Service Processor and Host Console

1. **To switch from the service processor to the host console, type `console`:**
  - From the ILOM shell:

```
-> console
host>
```

- From the ALOM CMT compatibility shell:

```
sc> console  
host>
```

**2. To switch from the console to the service processor, type hash-period (#.):**

You are switched to either the ALOM CMT compatibility shell or the ILOM shell, depending on the account that you previously accessed.

```
host> #.
```

## ▼ To Log Out of the Service Processor

- To log out of the ILOM shell or the ALOM CMT Compatibility shell, type `logout`.

```
sc> logout  
->
```

The ILOM login prompt is displayed.

---

# Creating an ALOM CMT Compatibility Account

By default, you communicate with the service processor on the server module using ILOM commands. However, you can create a special user account that enables you to communicate using ALOM CMT compatibility commands. The ILOM and ALOM CMT command sets are different, but they generally provide the same or similar functions.

For a list of ILOM and ALOM CMT compatibility shell commands, refer to the ILOM supplement document for the server module.

The following procedure describes how to create an account that provides access to the ALOM CMT compatibility shell.

## ▼ To Create an Account for the ALOM CMT Compatibility Shell

1. At the ILOM login prompt, log in as `root`.
2. Create an ILOM user account and set the account roles to `Administrator` and the CLI mode to `alom`.

The following example uses a typical account name of `admin` for the ALOM CMT compatibility shell.

Example:

```
-> create /SP/users/admin role=Administrator cli_mode=alom
creating user
Enter new password: *****
Enter new password again: *****
Created /SP/users/admin
```

---

**Note** – The asterisks in the example will not appear when you enter your password.

---

3. Log out of the ILOM root account.

Example:

```
-> exit
```

The ILOM login prompt is displayed.

4. To access the ALOM CMT compatibility shell, log in using the name and password you created.

At this point, you run ALOM CMT compatibility commands. For a list of commands, refer to the ILOM supplement document for the server module.